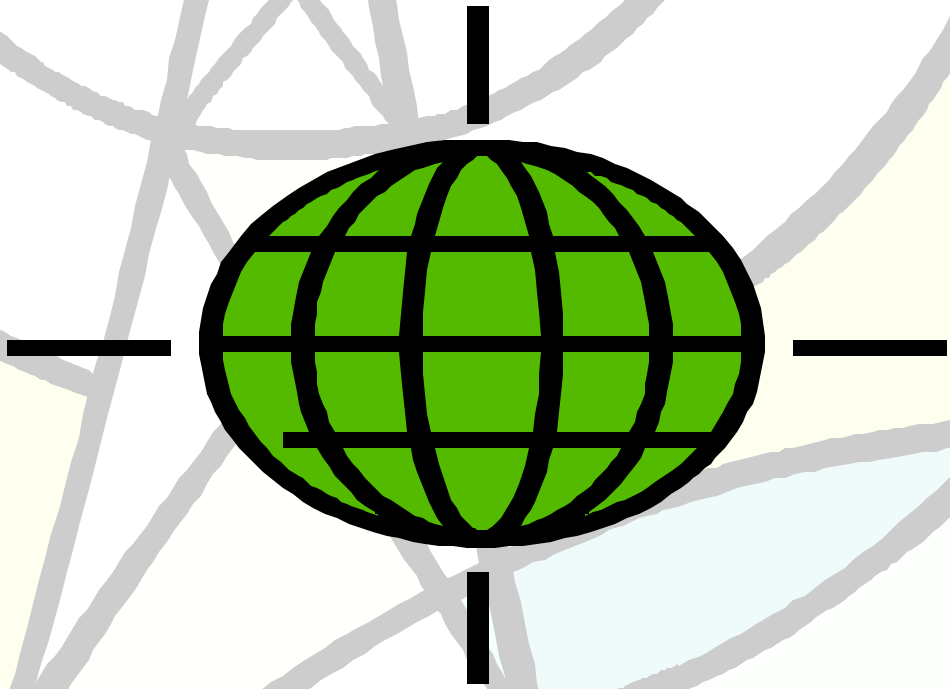
UNITED NATIONS

GLOBAL E-GOVERNMENT READINESS REPORT 2004

TOWARDS ACCESS FOR OPPORTUNITY



United Nations

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Department of Economic and Social Affairs
Division for Public Administration and Development Management

UN GLOBAL E-GOVERNMENT READINESS REPORT 2004

TOWARDS ACCESS FOR OPPORTUNITY

United Nations
New York, 2004

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The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates ad analyses a wide range of economic, social and environmental data information on which States Members of the United Nations draw to review common problems and to take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on the ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.

Preface

In 2000 the General Assembly adopted the Millennium Declaration which set out a vision for the future which affirmed that '… the benefits of new technologies, especially information and communication technologies, are available to all…'.

At present, the disparities in access to ICT-related development for the future are large. This disparity in access is likely to become larger, at the current rate of technological advancement. The challenge for development today is to find ways and means to surmount the inequality in development benefits from new technologies.

The new paradigm of development requires a re-visitation of the way countries think about ICT and e-government. It needs innovative approaches to government and the public sector; business and the citizen; and culture and society. A holistic approach is required which fully exploits the centrality of ICT for the vision of a future knowledge society.

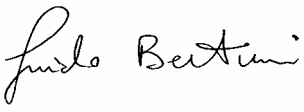
In this framework, the ***UN Global E-Government Readiness Report 2004: Towards Access for Opportunity*** contributes to the development efforts of the member states by focussing on the question of what defines 'access', what governs it and where are the countries of the world placed in terms of their provision of access opportunities.

In its quest for answers, ***Part I The UN Global E-government Survey 2004*** assesses the use of e-government, as a tool, to further the dissemination of information and service delivery. It ranks 191 member states according to e-government readiness and e-participation indices.

Part II Access for Opportunity presents a new paradigm of development which explores the disparity in real access to information and telecommunication technologies (ICTs). It analyses the various facets of the existing access divide worldwide and illustrates that rapid progress in ICT for development can lead to greater access and opportunity for nations and peoples.

We hope that this Survey will urge the member states, the policy makers and the practitioners to divert intellectual and financial resources to further exploring these issues.

We also hope that steps will be taken by government, the private sector and civil society worldwide to provide the resources needed to reduce the global disparities in ICT opportunities so that national e-government efforts can create an environment which is conducive to fulfilling the promise of 'including all' in development.



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The Report greatly benefited from the work of the research team at the Civic Resource Group. Dr. Gregory G. Curtin, Managing Director of Civic Resource Group and Director of the E-Governance Lab at the University of Southern California, led the research team. The team was comprised of Robert B. McConnachie, co-Managing Director of the Civic Resource Group, Kim J. Andreasson, Veronika Vis-Sommer and Christopher J. Walker as well as Iva Bozovic, Laura Hosman, Hooi-Peng Choo, Andreina Maraver, Anna Ryzhenkova, Eugenia Saloutsi, and Shadi Taleb-Hessami-Azar.

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Executive Summary

In the fast globalizing world economy of today, governments the world over are recognizing the importance of ICT in development. An increasing number of e-government initiatives are being employed to improve the delivery of public services to the people, and to tap the potential synergy from the interaction between new technologies, an educated population and an enabling environment for the attainment of knowledge-based economies.

The new imperative of development is to employ ICT applications across the board for creation of economic opportunities and human development.

The new imperative of development is to employ ICT applications across the board for creation of economic opportunities and human development. It is not a matter of choosing between traditional programs to further health, education or ICT but choosing *the most effective way* for ICTs to help in the delivery of development goals. If disparities are to be removed in the collective global march towards a knowledge society, free access to information and knowledge must become a way of life for all.

Drawing upon the United Nations Millennium Development Framework, this year's UN Global E-Government Readiness Report 2004 comprises two parts. Part I presents the UN Global E-Government Readiness Survey 2004 while Part II of the Report presents a special focus on what constitutes disparity in access to ICT.

The UN Global E-Government Readiness Survey 2004

The E-Government Readiness Survey 2004 assesses more than 50,000 features of E-government websites of the 191 UN Member States to ascertain how willing and ready the governments around the world are to employ the opportunities offered by ICT to improve the access, and quality, of basic social services to the people for sustainable human development. Employing a statistical model for the measurement of digitized services, the UN E-Government Readiness Survey 2004 assesses the public sector e-government initiatives of Member States according to a weighted average composite index of e readiness based on website assessment, telecommunication infrastructure and human resource endowment.

The E-Government Readiness Survey 2004 assesses … how willing and ready the governments around the world are to employ the opportunities offered by ICT to improve the access, and quality, of basic social services to the people for sustainable human development.

According to the e-government readiness rankings the United States of America (0.913) is the world leader followed by Denmark (0.904), the United Kingdom (0.885) and Sweden (0.874). The United States, as also North America, led the world ranking for delivering information and services through the Internet combined with the infrastructure needed to dispense them, followed by Denmark, the United Kingdom, Sweden and the Republic of Korea. Estonia, Malta and Chile were also among the top 25 e-ready countries. As a region, Europe followed North America, while South-Central Asia and Africa brought up the last.

The Survey 2004 results indicate progress in the past year. Five more countries came online with their e-government offerings; there was a notable increase in the number of government services portals/one-stop-shops; a marked increase in the amount and types of information provided at government websites; and the implementation of technical features continued at national websites to facilitate public information and service delivery.

…there remained wide disparities between, and among, regions and countries in their e-government program offerings.

In terms of participative decision-making, a special focus of the Survey, though many countries encourage e-participation, a few remained limited in their provision of relevant and qualitative mechanisms and tools for user feedback. Forty-three Member States out of 178 which maintained a government website had a clear e-government policy statement encouraging people to participate in public policy making; however, only 20 – or 11 percent – had an actual provision for user feedback on citizen participation. When ranked by e-participation, the United Kingdom was the top followed by the United States, Canada, Singapore and the Netherlands.

Notwithstanding, there remained wide disparities between, and among, regions and countries in their e-government program offerings. Governments in the high income countries are far advanced in their provision of public information, online services, communications and outreach to citizens, and overall electronic access to government. *The bottom 40 countries show little relative progress.*

Of particular concern are the South and Central Asia and Africa regions which are far behind the world in almost all aspects of access to ICT for development. Despite progress, the lack of infrastructure and education is the most serious barrier to further expansion of their e-government and ICTs for development initiatives. The enabling environment in many countries is characterized by irregular or non-existent electricity supplies, especially outside large cities; telephones remain luxury items; and the Internet is available to only the privileged few in the upper income brackets. South and Central Asia as a region was well below the world average e-readiness, with some of the countries among the least e-ready countries in the world. Access remains a serious issue in Africa with wide disparities between, and among, countries. The overall average e-government readiness index of 0.253 of Africa is only 61 per cent of the world average and 29 per cent of North America. A major effort by the various stakeholders is called for if e-government and ICT for development is to harness opportunity for all in these regions.

…Part II of the UN Global E-government Readiness Report 2004 delves into the issue of what constitutes a lack of access for opportunity or the '*access-opportunity divide*', what defines it, what governs it and where are the countries of the world placed in terms of their access to ICTs.

Measuring Access for Opportunity: A New Development Paradigm

In a special focus on global disparities in access to ICT, Part II of the UN Global E-government Readiness Report 2004 delves into the issue of what constitutes a lack of access for opportunity or the '*access-opportunity divide*', what defines it, what governs it and where are the countries of the world placed in terms of their access to ICTs. The Report proposes taxonomy of countries according to their access opportunities. In doing so it posits the *Access-for-Opportunity Framework*: a structured rethinking about accelerating 'real access' for all. Tracking the relative progress of Member States in implementing their ICT and e-government programs, the Framework contributes to a better understanding of the various facets of the digital divide and the lack of real access.

The Access-for-Opportunity Model maintains that physical access to ICT is only the first step towards building real access which leads to opportunity. Access must be blended with relevant and culturally appropriate content for onward transmuting into knowledge. The blended knowledge is processed and utilized to create opportunity for economic and social empowerment.

Access-opportunity divide comprises, among other: income divide, telecommunication access-divide, education and skill access-divide, language access-divide, content access-divide and affordability divide.

…the Access Model illustrates that the majority of the developing country population of more than 5 billion faces a grave challenge from the new technological revolution.

Exploring the access-divide elements the Access Model illustrates that the majority of the developing country population of more than 5 billion faces a grave challenge from the new technological revolution. Whereas some of the developing countries which have in place the right mix of reforms, institutions and programs will no doubt benefit from the ICTs, most are likely to be mired in a cycle of low income, poverty and a growing disparity in access to modern technology.

Using the vast database of the Survey 2004, the analysis of the existing access-divide parameters worldwide illustrates an important point: rapid progress in ICT for development can lead to greater access and opportunity for nations and peoples. In the globalized world, the distance between governments, businesses and the citizen with real access (the e-haves) has been reduced irrespective of their geographical location. At the same time the communication and distance between the government and those, with no-access no-skills and no-prospects (e-have-nots) is increasing. Countries where the majority of population has, or has the potential of achieving, real access are already at the stage of utilizing knowledge for increasing opportunity, i.e. the opportunity for economic gain; the opportunity for social empowerment; and the opportunity for societal improvement.

One of the central obstacles in ICT-for-opportunity is the current access-divide which appears across the world, not only across regions such as Africa where it is commonly perceived to exist, but also within individual countries due to the fact that in most countries only the well off currently have access to opportunity; these divides have to be bridged for regions and countries to reach full ICT-for-opportunity capability.

In this context, those developing countries, which have in place the right mix of reforms, institutions and programs will no doubt benefit from the ICTs, but many are likely to be mired in a cycle of low income, poverty and a growing disparity in access to modern technology.

Governments must specifically identify and address issues of real access—utilizing the Access Model put forth herein—rather than issues of technology.

However, despite evidence of the current divide in access to opportunity between - and among - countries it should not be cause for inaction. The promise of the new technology is indeed the tremendous opportunity inherent in it: the opportunity to leap-frog development and provide millions with higher standards of living and greater empowerment.

Key imperatives for governments which emanate from the Access-for-Opportunity Model include:

Governments need to adopt access for opportunity as a policy goal:

Governments must specifically identify and address issues of real access—utilizing the Access Model put forth herein—rather than issues of technology. The end goal should be access for opportunity, rather than solely access to ICT. In this context the governments need to develop and formally adopt E-government Plans and/or similar national ICT Plans that include access goals, economic development objectives, and long-term goals to achieve a knowledge economy/society.

Governments need to focus on knowledge societies:

To improve access-for-opportunity, countries must recognize the centrality of ICTs to development.

Governments need to re-think and re-engineer their development strategies towards building knowledge societies. A renewed commitment is needed to put ICTs within an integrated development framework to leap-frog the traditional long gestation phases of development and yield rapid economic and social progress for all.

Governments need to include ICTs in all planning initiatives:

To improve access-for-opportunity, countries must recognize the centrality of ICTs to development. The governments need to include ICT planning across all government sectors, particularly public education, public health, economic development, commerce and industry, law enforcement and security, and others—this integrated planning will lead to real e-government and ICT for development. E-government and ICT goals should be clearly articulated in terms of economic development and quality of life enhancements for all members of society.

Chapter I

I. Introduction: A New Paradigm for the Globalized World

In today's technology-driven globalized world, knowledge management is rapidly becoming the centerfold of the emerging development paradigm. The roots of this enveloping environment are embedded in two related phenomena. First, an increasing recognition of the potential of new technologies in transferring hitherto unimaginable amounts of information and knowledge at lightening speed; and second, the growing awareness of the positive linkages between these technologies, the knowledge society [1] and economic development.

A knowledge society produces opportunity.

Governments the world over are increasingly becoming aware of the importance of, and role of, a knowledge society in development. They are taking note of the synergy from the interaction between new technologies, an educated population and an enabling environment. They are hopeful about the potential offered by innovative indigenous application of the information and communication technologies (ICTs) to intractable local development problems. They are seeking to develop the essential economic and institutional framework, along with the necessary policies and funds for investments in knowledge, innovation, and new technologies which would reorient development programs and strategies for the attainment of knowledge-based economies.

Economic and social empowerment today rests on the ability to access, gather, analyze and utilize information and knowledge to widen individual choices for political, economic, social, cultural and behavioral decisions. There is a belief that the digital empowerment of society could become the cornerstone of development in the information age. [2] The application of knowledge – as manifested in areas such as entrepreneurship and innovation, research and development, software and design, and in people's education and skills levels – is being recognized to be one of the key sources of growth in the global economy. [3] It is the *exploitation* of the new tools of

[1] Knowledge society encompasses a knowledge economy but is not limited to it
[2] See for example, 'From The Global Digital Divide To The Global Digital Opportunity: Proposals Submitted To The G-8 Kyushu-Okinawa Summit 2000'.
http://www.weforum.org/pdf/DigitalDivide/Official_G8_Statement.pdf
[3] The World Bank. http://info.worldbank.org/etools/kam2004/html/userguide.htm

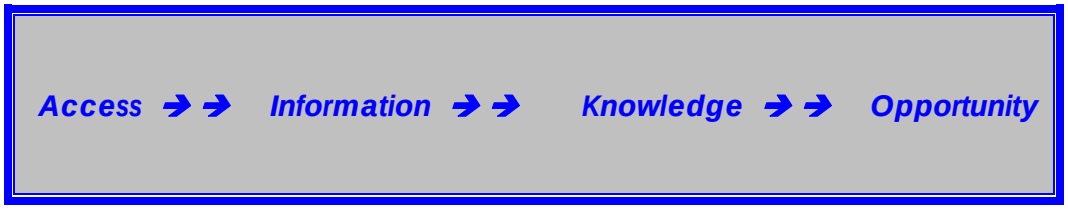
the knowledge economy that leads to opportunity, security, and empowerment, especially for poor people. [4]

Knowledge societies process, dispense and make more efficient use of information and services.

I.1 Knowledge Society, ICTs and Development

Knowledge societies process, dispense and make more efficient use of information and services. Improved efficiency leads to improved productivity and contributes to economic growth and social empowerment.

A knowledge society produces opportunity. This process of moving from Access to Opportunity is represented in the following continuum:



To move towards a knowledge society, countries need to develop a viable network of information infrastructure to facilitate the effective communication, dissemination, and processing of information; an educated and skilled population to effectively create, share, and utilize knowledge well; and an economic and institutional regime to provide incentives for the efficient use of existing and new knowledge. [5]

ICTs are the conduits which transmit information and knowledge. As such, ICTs are central to building knowledge societies. Access to information and knowledge is critical for sustainable development. By increasing knowledge and awareness about opportunities for income generation, health and education interventions, ICTs can contribute to poverty reduction. By integrating technology into development planning, more effective and speedy solutions can be found to the delivery of basic services.

The cornerstone of ICTs centrality to development rests on the speed with which information and services move between two points, effectively making the concept of time and distance archaic. Relevant and timely information is needed for everything from agricultural input into decision making to epidemic control. ICTs can help to increase access to market information and reduce transaction costs for poor farmers and traders; increase the efficacy of education and learning through the application of technologies and ICT-enabled skill development. Although ICTs are not a panacea for all social and economic problems they have a positive effect on society. Whether it is information about price fluctuations or for distance learning,

[4] The World Bank. ' Information and Communication Technologies: A World Bank Group Strategy.' 2002. p 1. http://info.worldbank.org/ict/assets/docs/ExecSum.pdf
[5] The World Bank. http://info.worldbank.org/etools/kam2004/html/userguide.htm

ICTs deliver timely and speedy information to end users reinforcing the effectiveness of decision making.

ICTs cut across all sectors to bring greater efficiency and opportunities to people: from services in education and health care to employment and trade; and from public participation to democracy. ICTs are powerful information processing tools which, when used appropriately as part of an overall development strategy, generate widespread benefits. The cornerstone of an ICT led development strategy is the enabling environment, which allows for a rapid acquisition, application, and utilization of knowledge for economic and social development.

ICT-driven development is fast becoming the cornerstone of the new development paradigm for the global economy.

ICT also has a great role in the public sector reform and governance. It can help improve transparency and efficiency of the public sector, create network links across service delivery agencies, cut bureaucratic red tape and realize vast savings. ICTs in the public sector can engage citizens as participants in the overall development for the future.

ICT-driven development is fast becoming the cornerstone of the new development paradigm for the global economy. There is growing evidence that adoption of new technologies is an imperative if countries want to gain from the global trade, investment, information and services flows around the world. The speed of economic functions possible with the new technological innovations, especially the internet, has allowed for markets to become virtually limitless as businesses and firms link into the supply chain around the globe. As costs of technology go down the benefits from ICT-driven economic and social development structures multiply opportunities for all.

I. 2 Access Inequalities

The current enthusiasm reserved for the flow of benefits from ICT indoctrination assumes equal opportunity in the developing countries to employ ICTs to leapfrog ahead towards knowledge societies. The reality is that access to – and distribution of – tools for knowledge and wealth creation are highly unequal both among, and between, countries of the world. For example, whereas the average OECD country has 11 times the per capita income of a South Asian country, it has 40 times as many computers, 146 times as many mobile phones and 1036 times as many internet hosts. [6] As the UN Global E-government Survey 2003 indicated, the least e-ready region is Africa. There are 12 million internet users in the whole of Africa compared to 203 million in the United States alone. [7] Africa comprises 14 percent of the world population but has only 1.5% of the world's internet users. This is in stark comparison to North America which is home to only 5 percent of the world's population, but this population represents 28 percent of the world's internet users. [8] Or consider the fact that even though internet use in the Middle East grew 219 percent during the period 2000-2004, only 2 percent of the world users are from the region. [9]

The reality is that access to – and distribution of – tools for knowledge and wealth creation are highly unequal both among, and between, countries of the world.

[6] The World Bank. ' Information and Communication Technologies: A World Bank Group Strategy.' 2002. p 5.
[7] Internet World Statistics. http://www.internetworldstats.com/stats.htm
[8] InternetWorldStats.com. http://www.internetworldstats.com/stats8.htm
[9] http://www.internetworldstats.com/stats.htm

Access to the new ICTs is unequal between countries as well. Mali, Ethiopia and Niger, for example, have one phone line for every 200-500 persons compared to around one for every person in the United States. In the Republic of Korea every 2nd person is an internet user and has a telephone in stark contrast to Cambodia with only one telephone for every 300 persons and only 1 in every 1250 persons is online.[10]

Furthermore, not only are there existing disparities in e-readiness, the rapidity of technological advances is leaving most of the developing countries behind. As they struggle to keep up programs the very applications installed run the danger of becoming obsolete with large populations remaining insulated from state-of-the-art knowledge tools.

This disparity in access is likely to become larger at the current rate of technological advancement – and adoption – in a select few countries of the world.

At present, the disparities in access to ICT-related development for the future are large. This disparity in access is likely to become larger at the current rate of technological advancement – and adoption – in a select few countries of the world. As more of the services in an economy come online those individuals and groups without access will be marginalized. One research study at the World Bank shows that countries with one standard deviation higher teledensity than average are likely to see a 6.5 percent increase in inequality over the next decade. [11]

Disparity in access is also important from an equity standpoint since it tends to perpetuate existing income and other inequalities in a vicious cycle. The poor lack income to be connected to ICTs which in turn reduces their opportunities for obtaining and utilizing information for employment, health and education thus leading to higher potential for continuing reductions in income again. According to one research, the richest 20 percent of the households in South Africa are 125 times more likely to have private telephones than the bottom 20 percent of the households.[12] As governments seek to establish the economic, social and institutional foundations of knowledge society, especially as they adopt new technologies and provide more and more government services online, those without access *within a country* are likely to be left out, exacerbating existing inequalities.

Interestingly many stakeholders are increasingly becoming aware of the nexus between ICT, knowledge society and development. In an ITU opinion poll in 2003, 77.3 percent of the stakeholders cited poverty, 76 percent lack of education and 72.8 percent lack of infrastructure as the top three barriers to integration in the global information society. Sixty seven percent of the same respondents thought the United Nations should take the lead role in addressing these barriers. The following table shows a summary of the responses from the ITU poll cited.

[10] From the UN Global E-government Survey 2004 Infrastructure database based on ITU Telecommunications data.
[11] The World Bank. ' Information and Communication Technologies: A World Bank Group Strategy.' 2002. p 8.
[12] Ibid. p 5.

Table 1.1.
Barriers to achieving the information society

	Percent of maximum points that could have been attributed
Poverty	77.3
Low levels of literacy	76.0
Lack of adequate infrastructure	72.8
High-prices ICT services	70.8
Lack of investment	69.8
Poor institutional structures	69.8
Absence of international cooperation	63.0
Lack of security	52.5
Other	1.30

Source: ITU. http://www.itu.int/osg/spu/wsis-themes/survey/index.html

I.3 United Nations Efforts Towards Reducing Disparities

Cognizant of the existing disparities, the world leaders at the United Nations General Assembly in 2000 adopted the UN Millennium Development Declaration which voiced concern that whereas '… globalization offers great opportunities, at present its benefits are very unevenly shared, while its costs are unevenly distributed….' [13] To achieve their vision for the future the leaders established benchmarks, the Millennium Development Goals (MDGs), for worldwide poverty reduction; universal primary education; health and environment; and gender equality. Responding to the potential for greater inequity, the world leaders made a specific commitment '…to ensure that the benefits of new technologies, especially information and communication technologies, are available to all….'[14]

The cross cutting nature of new technologies in today's globalized world suggests that ICTs must be placed as central to any development strategy. If disparities are to be removed in the collective global march towards a knowledge society, free access to information and knowledge must become a way of life for all.

United Nations is working towards reducing the digital divide and fostering greater awareness of the potential of new technologies for the development of knowledge economies. The UN Department of Economic and Social Affairs (UNDESA) takes the lead in information dissemination about the centrality of ICT for knowledge societies; research into ways and means to do it; and policy advice and capacity building to assist Member States in reducing digital disparities and promoting e-government for development.

The UN specialized agencies follow suit in undertaking projects and programs in ICT and e-government development. From the UN Secretariat to International Telecommunications Union (ITU) to the UN Educational and Scientific Organization (UNESCO) to the United Nations Food and Agricultural Organization (FAO) the message of the global body is the same: *the cross cutting nature of new technologies in today's globalized world suggests that ICTs must be placed as central to any development strategy. If disparities are to be removed in the collective global march towards a knowledge society, free access to information and knowledge must become a way of life for all.*

The UN established the ICT Task Force in 2001 to work towards a global solution to the issue of the global digital divide, foster digital opportunity and employ ICT in

[13] Draft resolution referred by the General Assembly at its fifty-fourth session. United Nations A/55/L.2*. 6 September 2000.
[14] Draft resolution referred by the General Assembly at its fifty-fourth session. United Nations A/55/L.2*. 6 September 2000.

the service of development for all. The Task Force brings together global multi-stakeholders to create synergy in its initiatives aimed at harnessing the potential of the ICT revolution for the reduction of poverty, and for the empowerment of those who are currently marginalized so as to '… transform the digital divide into the digital opportunity for all of humanity....' [15]

To generate world awareness about the important role of the ICTs in development the United Nations held the World Summit on Information Technology (WSIS) in December 2003. In outlining their ICT-driven vision for the future the Summit leaders declared a '…common desire and commitment to build a people-centered, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life….' [16]

Access to ICT is not only a MDG goal by itself but is crucial for the attainment of all other goals. To this end the United Nations has set up various initiatives seeking to exploit the potential of new technologies to further the MDGs and afford opportunities to bridge the digital divide. One such effort is the UN ICT task force sponsored 'Global e-Schools and Communities Initiative' which seeks to improve education, empower communities and accelerate socio-economic development while supporting achievement of the Millennium Development Goals, through the widespread deployment of ICTs in schools. It employs ICTs to improve the productivity of teachers and administrators, extend education to hard-to-reach places and provide students with compelling and effective content and tools for learning – more efficiently and at lower cost than traditional methods. [17]

Several other UN agencies have taken up the challenge of incorporating ICT-driven development into national agendas. More notable are the efforts of UNESCO which aims at propagating the use of ICTs as tools to be used and adapted to serve educational goals inter-linked with ICT and development. Among other initiatives, UNESCO has launched a new pilot initiative to put ICTs to work in the hands of the poor as part of its cross cutting theme on the eradication of poverty. The focus is not so much on technology itself, but on its innovative use to empower the poor with tools to change their circumstances. [18] (See box below.)

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[15] http://www.unicttaskforce.org/about/
[16] WSIS Declaration of Principles, Document WSIS-03/GENEVA/DOC/4-E.December 2003 http://www.itu.int/dms_pub/itu-s/md/03/wsis/doc/S03-WSIS-DOC-0004!!MSW-E.doc
[17] http://www.unicttaskforce.org/ http://www.gesci.org/
[18] UNESCO. http://www.enrich.nic.in/

Box 1

A select few of the United Nations Agencies efforts in ICT for Development

Putting ICT in the Hands of the Poor

eNRICH http://www.enrich.nic.in/intro.htm has been developed as a web-based community software solution framework that adapts to the needs and circumstances of the poor. Through its customizable, multi-lingual interface, eNRICH truly puts ICTs to work in the hands of the poor. Its multiple features not only enable communities to identify, build and organize relevant information but also promote communication between and among communities. The framework encourages collection, preservation and sharing of indigenous knowledge. With the ultimate aim of empowering communities through a collaborative approach, eNRICH acts as a platform for voicing the thoughts and feelings of the poor. eNRICH also facilitates research and analysis of its usage pattern to understand the impact of social and technological strategies in order to further innovate and align ICT solutions as a tool for poverty reduction.

UNESCO's ICT Portal for Teachers

To further equal access to education in the world, UNESCO's "ICT Portal for Teachers" http://www.unescobkk.org/ips/ict/ict.htm provides a gateway to Internet resources and websites to help teachers utilize ICT to enhance their teaching. The program's focus is on how to use ICT to reduce disparities in both educational access and quality and, ultimately, bridge the digital divide. UNESCO envisions that the ICT program will result in an educational environment involving enriched curricula, resource sharing, quality multimedia material, and a cadre of teachers who are competent in facilitating better learning with ICT. [19]

Electronic Delivery of Agricultural Information to Rural Communities

Under the Acacia Initiative Program in Africa the International Development Research Centre (IDRC) in collaboration with the United Nations Food and Agricultural Organization (FAO), supports rural communities in Uganda http://www.agricinfo.or.ug/background.htm to accelerate the wider delivery of appropriately packaged agricultural information using the existing telecenters. The project aims at strengthening agricultural information resources and services and developing relevant local content, through identification, collection, procurement and repackaging agricultural information, for dissemination to grassroots communities.

The various UN agencies initiatives in the area of ICT for development lend a synergy to their activities building towards a greater whole. In 2000 the UN Health InterNetwork was created to help bridge the digital divide in health by providing unrestricted, relevant, and affordable health information online to all peoples of the world so that all communities can benefit from this global public good. [20] Led by the World Health Organization, the initiative brings together multi stake holders in a global partnership to improve public health, using internet technologies. Now in collaboration with UNESCO, a new variant – the Health Organizer – is born which is a customized version of UNESCO's eNRICH that envisages addressing the

[19] UNESCO. http://www.unesco.org/cgi-bin/webworld/wsisdirectory/cgi/search.cgi?d=1&query=&unesco_principles=Equal+access+to+education&bool=and&substring=0&mh=25

[20] http://www.healthinternetwork.org/src/millenium.php

information needs of health workers in remotely located primary and community health centers.

I.4 The Emerging Imperative of Development

As countries progress in employing ICTs for development, the challenges underpinning inequality in access have shifted from a connectivity issue to encompass a wide array of economic, social; cultural and language barriers.

The new imperative of development is to employ ICT applications across the board for creation of economic opportunities. It is not a matter of choosing between traditional programs to further health, education or ICT but choosing *the most effective way* for ICTs to help in the delivery of development goals. [21]

I.4.1 Access for All

Whereas in many quarters the digital divide is mostly thought of as an issue of connectivity alone, the issue of disparity in access is multi faceted. Access to ICT for development is no more limited to e-haves and e-have-nots. As countries progress in employing ICTs for development, the challenges underpinning inequality in access have shifted from a connectivity issue to encompass a wide array of economic, social; cultural and language barriers.

Meaningful access to ICT goes beyond connectivity issues to embrace digital, human, economic and social resources and relationships: content and language, literacy and education, and community and institutional structures. [22] Moreover, there are many different *degrees of access* to ICTs. In between the e-haves and e-have-nots are all those who may have access to some ICT, and may have some educational skills, but not sufficient to allow them an effective choice. On the demand side the usage of the tools of the information economy may suffer from high costs of technology, lack of technical skills or if government policies and regulations impede access to all.

The issue of a digital divide is essentially one of a ***disparity in real access*** *which is inequality in both physical access to ICTs and the ability, know-how and the culture to use the technology well.*

I.4.2 E-government for Real Access

For e-services to reach all, the e-government programs and policies must be set within an integrated and holistic framework of an overall ICT-for-development policy and action plan.

The UN E-government Survey 2003 stated that the potential of e government, as a tool for development, hinges upon three pre requisites – a minimum threshold level of technological infrastructure, human capital, and e-connectivity – for all. E government strategies and programs will be able to be effective and '*include all*' peoples only if, at the very minimum, *all* have functional literacy and education, which includes knowledge of computer and internet use; *all* are connected to a computer; and if *all* have access to the internet. The benefits – and reach – of e-government [23] programs is crucially dependant on ***real access*** to ICT for all.

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[21] The World Bank. ' Information and Communication Technologies: A World Bank Group Strategy.' 2002. p 6.

[22] 'Reconceptualising the Digital Divide' by Mark Warschauerhttp. http://www.firstmonday.dk/issues/issue7_7/warschauer/

[23] E-government is defined as the use of all ICTs by government to provide information and services to citizens. It is a broader concept than in cases where is refers to only G-2-G networking.

To promote *real access for all* requires a supply of ICT access infrastructure and a demand to use the information networks. For e-services to reach all, the e-government programs and policies must be set within an integrated and holistic framework of an overall ICT-for-development policy and action plan. Effective e-government programs can support good governance by improving the efficiency and reach of public services such as education and health and providing greater information to the citizen for engaged public policy and decision making.

Most industrialized countries have initiated programs spearheading ICT development for knowledge society. For example, eEurope was launched in 1999 to ensure that every citizen, home and school, every business and administration, becomes integrated into the digital age and online; creating a digitally literate information society in Europe.[24] The strategic goal for Europe is to become "…the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion." [25]

In several developing countries also e-government initiatives are being employed to improve both the access and the reach of traditional public services. Enveloping greater swaths of the populations through public access programs accords the poorer segment with greater economic and social opportunities. For example, under the Government of Malaysia's vision of the "k-economy" e-Bario is a development project that utilizes computers, telephones, and VSATs to connect villagers in the remote village of Bario to the internet. E-Bario highlights the Malaysian government's commitment in achieving its objective of connecting 25 percent of the population to the Internet by 2005 and helping the community of Bario realize their potential to reshape their environment and move towards becoming a knowledge society. [26]

To realize development, governments … need to take the lead in establishing and reforming institutions, regulations and structures, which incorporate the principles of the centrality of ICTs into strategies and programs.

Whereas many governments in the developing world have recently begun to establish and expand e-government service structures, successful implementation of ICTs have proved to be an effective instrument for connecting disparate government communication networks at every level and increase citizen participation in public decision-making. Whether they are streamlining the provisioning of government services or empowering populations, e-government and ICTs have become one of the most important requirements for modern governments the world over. For example, the Republic of Korea has been in the forefront to emphasize the importance of ICT as an economic stimulus. Six major national projects have structured the direction of Government policies, including the recent "Global leader, e Korea", the slogan of the latest Ministry of Information and Communication (MIC) initiative. Goals include getting more than 90 percent of all Koreans online, improving e-government and encouraging schools to use more sophisticated ICT applications. [27]

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[24] EurActiv.com. Date: 25/04/2000
http://www.euractiv.com/cgi-bin/cgint.exe/365080-764?204&OIDN=2000642

[25] 'Report On The European E-learning Summit 2001' .European Learning Summit. May 2001. p 7.
http://www.ibmweblectureservices.ihost.com/eu/elearningsummit/

[26] http://www.itu.int/osg/spu/wsis-themes/ict_stories/e-bariocasestudy.html

[27] http://www.itu.int/osg/spu/wsis-themes/ict_stories/egovernment.html

To realize development, governments have an important responsibility to fully exploit the potential use of e-government and ICTs for development. Governments need to take the lead in establishing and reforming institutions, regulations and structures, which incorporate the principles of the centrality of ICTs into strategies and programs. They need to employ e-government resources, as an entry point, for furthering development. They also need to develop action plans and development strategies, which exploit the opportunities afforded by technologies in promoting the traditional models of development. In the framework of national development policies governments can take the necessary action to support an enabling and competitive environment for the necessary investment in ICT infrastructure and for the development of new services.

E-government programs can:

- spearhead awareness about the potential of ICT in economic and social empowerment in a knowledge economy;
- use e-government for public sector governance reform;
- build an infrastructural base;
- employ e-government initiatives for improved service delivery; and
- engage the citizen into a multi stakeholder partnership towards the development of a knowledge society.

This year the UN Global E-government Readiness Report 2004 seeks to highlight the importance of the nexus between ICT, knowledge society and development. It delves deeply into the multi faceted issue of *Access-for-Opportunity*: what defines it, what governs it and where are the countries of the world placed in terms of their access to ICTs. It proposes a taxonomy of countries according to their access opportunities. In doing so it posits a model for a structured re-thinking of accelerating real access for all. Tracking the relative progress of Member States in implementing their ICT and e-government programs in the service of the citizen, it contributes to a better understanding of the various facets of the digital divide and the lack of real access.

PART ONE

THE UN GLOBAL E-GOVERNMENT SURVEY 2004

Chapter II

II. Benchmarking E-government

The UN Global E-Government Survey 2003 highlighted that there was a wide disparity between Member States in their e-government readiness. The 2004 report goes deeper into the issues and challenges of the disparities in 'access to the opportunity for development' offered by ICTs. It discusses the various aspects of the digital divide and presents the thesis that the digital divide is not only a disparity between those who are connected and those who are not but that it encompasses a wide range of issues which cause disparities in access to proper utilization of ICTs. It identifies the boundaries of what constitutes lack of access to ICT. In its data analysis it presents a picture of where the countries are placed in providing access to all.

II.1 E-Government Readiness Index

…the E-Government Readiness Index … is a composite measurement of the *capacity* and *willingness* of countries to use e-government for ICT-led development.

At the core of this Survey is the E-Government Readiness Index, which is a composite measurement of the *capacity* and *willingness* of countries to use e-government for ICT-led development. Along with an assessment of the website development patterns in a country, the e-government readiness index incorporates the access characteristics, such as the infrastructure and educational levels, to reflect how a country is using the ICT opportunity for national, economic, social and cultural empowerment of its people.

The e-government readiness index offers insights into different strategies, clear patterns and common themes in development patterns among regions and across them. By tracking the progress of Member States globally over time it seeks a better understanding of the challenges to nation states: the challenge of encouraging greater use of e-government and ICT while ensuring the opportunity for access is available to all; the challenge of finding resources to integrate new technologies into traditional development patterns at a pace that allows for exploitation of those opportunities; the challenge of devising appropriate e-government strategies and policies which would overcome the scarcities of manpower and infrastructure, language and content, and income and power.

The e-government index also signals broad trends among countries and across regions. It contributes to the discussion of the centrality of ICT to development by gaining a better understanding of the emerging patterns of country performance across the world. Within the conceptual framework of this report, it also identifies

countries where the potential of e-government and ICT for development has not yet been exploited.

…the e-government readiness index ranks government's efforts while taking into account their size; infrastructure availability and ICT penetration; and the level of education and skill development.

By constructing a comparative index the e-government readiness index ranks government's efforts while taking into account their size; infrastructure availability and ICT penetration; and the level of education and skill development. The relative rankings assess a country *within its economic and social development context*. By ranking the performance of countries on a relative scale, the index provides a valuable input for policy making and agenda setting for the future.

The e-government readiness indices are useful for government officials, policy makers, researchers, and the representatives of civil society and the private sector to gain a deeper understanding of the comparative benchmarking of the relative position of a country in utilizing e-government for the citizen vis a vis the rest of the world economies. The Survey aims to inform and improve the understanding of policy makers' choices to shape their e-government programs in the service of development. The Survey rankings – which serve as a snapshot – hope to shape further consolidation of ICT programs which contribute to a more participatory public policy model of development for all.

II.1.1 The Conceptual Framework, Methodology and Data Measurement

To assess the progress of 'access to ICT for all' in the Millennium Development Goals, this Survey measures the provision of information and services to the public through the use of e-government. E-government, within the ICT network, is considered to be a tool at the disposal of the government, which, if applied effectively, can contribute substantially to promoting human development. It supports, but does not supplant, the development efforts of Member States.

The concept of e government in this Survey espouses two aspects.

- The ***capacity*** of the public sector to deploy ICT for improving knowledge and information in the service of the citizen. The Survey names it the e-government readiness capability of the government. Capacity espouses financial, infrastructural, human capital, regulatory, administrative and systemic capability of the state; and
- The ***willingness***, on part of the government, to provide information and knowledge for the empowerment of the citizen.

The relative rankings assess a country within its economic and social development context.

In ranking all Member States the Survey explores the issue: 'how ready are the countries to take advantage of the opportunity provided by ICTs for development'? The Survey conceptualizes models of e-government progression and quantitatively measures the relative strengths and weaknesses in e-government and ICT for development strategies of countries worldwide. In this context, the Survey contributes to the ongoing attempt to provide quantitative research in the use of ICTs for development. It provides a global benchmarking tool for monitoring progress of countries as they consolidate and expand their e-government service delivery programs.

It is important to present a platform of benchmarking for a systematic comparison of the state of access to public services. Two years in a row, the Survey 2003 and

2004 presents a systematic comparison of the e-government programs and initiatives of Member States across the globe. Since the e-government rankings are based on relative indices, changes from year to year measure the progress of a country *relative to all other countries of the world.* As such the e-government index is a true global ranking tool.

The UN Global E-government Readiness Report 2004 assesses the 191 Member States of the UN according to a composite index of e-government readiness based on website assessment, telecommunication infrastructure and human resource endowment.

As in last year's Survey, e-government is considered to be the means to an end – the end being development for all. It is considered to be a tool at the disposal of the government, which, if applied effectively, can contribute substantially to promoting human development. It supports, but does not supplant, the development efforts of Member States. E-government is defined as the use of information and communication technology (ICT) and its application by the government for the provision of information and basic public services to the people. Among the objectives of e-government four are of paramount importance and of relevance here:

Since the e-government rankings are based on relative indices, changes from year to year measure the progress of a country *relative to all other countries of the world.* As such the e-government index is a true global ranking tool.

a) Efficient government management of information to the citizen;
b) Better service delivery to citizens;
c) Improved access and outreach of information; and
d) Empowerment of the people through participatory decision making.

In the framework of the Survey, a 'government' encompasses the executive, legislative and judiciary organs of the government; 'consumer/citizen' includes any member of the civil society (individuals as well as organizations); e-government comprises electronic interactions of three types: government-to government (G2G); government-to-business (G2B) and its reverse; and government-to-consumer/citizen (G2C), and its reverse. With this perspective, the Survey adopts a people-centric approach to e-government. It limits itself to exploring government-to-consumer/citizen (G2C) and consumer/citizen-to-government (C2G) relationships.

The objectives of the Survey are to provide:

1. A comparative assessment of the willingness and ability of governments in the use of e-government and ICTs as tools in the public delivery of services; and
2. A benchmarking tool for monitoring progress of countries as they progress towards higher levels of digital public service delivery in the future.

***The UN Global E-government Readiness Report 2004* assesses the 191 Member States of the UN according to a composite index of e-government readiness based on website assessment, telecommunication infrastructure and human resource endowment.**

While the e-government index and the web measure indices are indicative of the patterns of use of e-government as a tool for diffusion (and the use of ICTs) in development, it should be kept in mind that both are broad relative indices. Caution should be exerted in interpreting too finely the change in rankings of a country within a few positions of similarly ranked countries. The same is true when assessing the lowest on the scale.

The most important point to note is that ranks do not signify a race to e-government proliferation. The Survey does not suggest that 'higher' rankings are necessarily a 'better' outcome or even a desirable one. As was stated in the previous Survey, each country has to decide upon the level and extent of e government initiatives in keeping with its indigenous development framework.

The Survey results cannot be disassociated from the development context and resource endowments of a country. The indices and rankings in the Survey measure progress on the e-government and ICT for development programs of countries. As such they reflect the context of a country's political, economic, technological, cultural development.

The measurement of e-government is confined to the assessment of the state's use of internet and the World Wide Web for delivery; and its level of telecommunication and human capital infrastructure. The UN Global E-Government Readiness Report 2004 presents a comparative ranking of the countries of the world according to two primary indicators:

1. the state of e-readiness; and
2. the extent of e-participation.

II.1.2 UN Global E-government Readiness Index 2004

E-government Readiness Index is a composite index comprising the Web measure index, the Telecommunication Infrastructure index and the Human Capital index.

i. Web Measure Index

For the countries which have established an online presence, the model defines stages of e-readiness according to a scale of progressively sophisticated citizen services.

The Web Measure Index 2004 is based upon a five-stage model, ascending in nature, and building upon the previous level of sophistication, of a state's online presence. For the countries which have established an online presence, the model defines stages of e-readiness according to a scale of progressively sophisticated citizen services. Countries are ranked in consonance with what they provide online.

The web measure assessment model does not assess the quality of services by design. As such, any discretionary ratings are eliminated from the quantitative web measure and the e-government readiness indices minimizing the bias inherent in combining qualitative assessments with quantitative measures. Below are the five stages in the Web Measure Assessment Model

As in 2003, all of the 191 Member States of the United Nations were assessed in 2004. The Web Measure Survey assessments are based on a survey instrument which allows for only a binary value to the indicator based on the presence/absence of specific electronic facilities/services available. The primary site was the National Portal or the official homepage of the government. Where no official portal was available additional government sites were assessed.

The Survey confined itself in 2004 to central government website assessments alone only to provide a consistent platform for comparative analysis across the countries. There were several countries with decentralized structures of national and provincial

governments such as education and health, and which had little or nothing online on the central government ministerial/departmental site. In such instances, numerical scores were adjusted accordingly so as not to penalize them.

Box 2
Stages of E-government Evolution

Emerging presence. Stage I e-government presents information which is limited and basic. The e-government online presence comprises a web page and /or an official website; links to ministries/departments of education, health, social welfare, labor and finance may/may not exist; links to regional/local government may/may not exist; some archived information such as the head of states' message or a document such as the constitution may be available on line; most information remains static with the fewest options for citizens.

Enhanced presence. In Stage II the government provides greater public policy and governance sources of current and archived information, such as policies, laws and regulation, reports, newsletters, and downloadable databases. The user can search for a document and there is a help feature and a site map provided. A larger selection of public policy documents such as an e-government strategy, policy briefs on specific education or health issues. Though more sophisticated, the interaction is still primarily unidirectional with information flowing essentially from government to the citizen

Interactive presence. By Stage III the online services of the government enter the interactive mode with services to enhance convenience of the consumer such as downloadable forms for tax payment, application for license renewal. Audio and video capability is provided for relevant public information. The government officials can be contacted via email, fax, telephone and post. The site is updated with greater regularity to keep the information current and up to date for the public.

Transactional presence. Stage IV allows two-way interactions between the citizen and his/her government. It includes options for paying taxes; applying for ID cards, birth certificates/passports, license renewals and other similar C2G interactions by allowing him/her to submit these online 24/7. The citizens are able to pay for relevant public services, such as motor vehicle violation, taxes, fees for postal services through their credit, bank or debit card. Providers of goods and services are able to bid online for public contacts via secure links.

Networked presence. Stage V represents the most sophisticated level in the online e-government initiatives. It can be characterized by an integration of G2G, G2C and C2G (and reverse) interactions. The government encourages participatory deliberative decision making and is willing and able to involve the society in a two-way open dialogue. Through interactive features such as web comment forms and innovative online consultation mechanisms, the government actively solicits citizen views on public policy, law making, and democratic participatory decision making. Implicit in this stage of the model is the integration of the public sector agencies with full cooperation and understanding of the concept of collective decision making, participatory democracy and citizen empowerment as a democratic right.

For detailed model and schema see the 'United Nations Global E-government Survey 2003'. http://www.unpan.org/egovernment3.asp

Moreover, to ensure consistency across countries, the *number of functionally same/similar* sites was assessed in each country. Since the Survey's primary objective is to measure government effectiveness in delivery of basic economic social services to the citizen, the additional sectoral sites assessed were the Ministries/Departments of Health, Education, Social Welfare, Labor and Finance. These were representative of what services citizens require most from the government. Each ministerial site was assessed on the same set of questions to ensure consistency.

In total, more than 50,000 online features and services for 178 countries across six economic and social sectors were measured. Thirteen countries were not online.

The assessment of online services was carried out during April-May 2004. It is acknowledged that websites around the world are constantly evolving and with speed. A few countries websites were under construction or not available during that time. Whereas the sites were checked several times during that period there is a possibility that fresh websites and/or added features on a website may have come online in the months that followed. It does not detract from the comprehensiveness of the Survey and is unlikely to impact on the comparative e-government readiness ranking of countries presented here which reflects long gestation telecommunication and human capital infrastructure developments.

ii. Télécommunications Infrastructure Index

The telecommunication infrastructure index 2004 is a composite weighted average index of six primary indices based on basic infrastructural indicators, which define a country's ICT infrastructure capacity. These are: PC's/1000 persons; internet users/1000 persons; telephone lines/1000 persons; online population; mobile phones/1000 persons; and TV's/1000 persons. Data for UN Member States was taken primarily from the UN International Telecommunication Union (ITU) and UN Statistics Division, supplemented by the World Bank. The data across countries was standardized by constructing six separate indices for the indicators. See Technical Note for details on constructing the indices.

iii. Human Capital Index

The data for the human capital index 2003 relies on the UNDP 'education index' which is a composite of the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio with two third weight given to adult literacy and one third to gross enrolment ratio. See Technical Notes for details.

The *E-Participation Index* assesses the quality, usefulness and relevancy of the information and services and the willingness of countries to engage citizens in public policy making through the use of the e-government programs.

II.1.3 The E-participation Conceptual Framework

The *E-Participation Index* assesses the quality, usefulness and relevancy of the information and services and the willingness of countries to engage citizens in public policy making through the use of the e-government programs.

The goal of e-participation initiatives is to improve the citizen's access to information and public services; and participation in public decision-making. E-participation aims to achieve these objectives through the means of:

a) Increasing e-information to citizens for decision making;
b) Enhancing e-consultation for deliberative and participatory processes; and
c) Supporting e-decision making by increasing the input of citizens in decision making.

The E-participation Index is segmented into three sections: E-information, E-consultation, and E-decision making. These three are the qualitative equivalent of the quantitative web measure survey. Having identified through the quantitative review specific tools and information, such as explicit information/guidance on e-participation; access to and archives for government documents and databases; web-forums and formal on-line consultation systems; and a range of other features, E-participation scoring assesses "how relevant and useful these features were; and how well were they deployed by the government." The variations among countries were enormous. Providing such an index to complement the raw data, therefore, is an important and valuable means of evaluating both the efforts of governments and the actual quality of the information and services provided.

Box 3
Participation Framework

E-Information:
The government websites offer information on policies and programs, budgets, laws and regulations; and other briefs on key public interest. Tools for dissemination of information exist for timely access and use of public information, including web forums, email lists, newsgroups and chat rooms.

E-Consultation
The government website explains e-consultation mechanisms and tools. It offers choice of public policy topics online for discussion with real time and archived access to audio and video of public meetings. The government encourages citizens to participate in discussions.

E-Decision-making
The government indicates it will take citizen input into decision-making. Government provides actual feedback on the outcome of specific issues.

The data should be interpreted with caution. The e-participation index is based on qualitative assessments of the websites as gauged by the quality and relevancy of participatory and democratic features and services available on the sites. Whereas all caution is taken, it should be kept in mind that any qualitative assessment may inherently impart a bias in scores based on the researcher's perspective. The resulting scores should be interpreted with caution. Finally, the comparative ranking of countries is purely for illustrative purposes.

Data and methodology for the e participation index

In total 21 citizen informative and participatory services and facilities were assessed across 191 countries in e-information, e-consultation, and e-decision making across six general, economic and social sectors. Each country was assessed on a scale of 0-4.[28] The index was constructed by standardizing the scores.

[28] Zero=never; 1 = sometimes; 2 = frequently; 3 = mostly; and 4 = always

Chapter III

III. Research Findings and Analysis

III.1 Major Findings

The findings of the Survey are grouped into three areas for easy reference.

E-government Rankings

1. This year's Survey re-confirms that the countries in the regions of **North America (0.875)** and **Europe (0. 587)** are the world leaders in e-government readiness.

2. In the rest of the world, the regions of **South and Eastern Asia (0.460);** and **South and Central America (0.456)** had the highest indices followed by the **Caribbean (0.411); Western Asia (0.409); South and Central Asia (0.321); Oceania (0.301 and finally Africa (0.253).**

3. The **United States (0.913)** is the world leader followed by Denmark **(0.904),** the **United Kingdom (0.885)** and **Sweden (0.874).**

4. The **global** e-government readiness is **0.413**.

Global E-government, E-participation and 'Access to Opportunity for Development'

5. The research finds steady and gradual improvement in Member States' e-government readiness around the world. Overall, the research identified a greater number of national governments and ministries online; a notable increase in the number of government services portals/one-stop-shops; a marked increase in the amount and types of information provided at government websites; and the continued implementation of technical features at national websites to facilitate public information and service delivery.

6. There are wide disparities between, and among, regions and countries in their e-government program offerings. Governments in the high income countries are far advanced in their provision of public information, online services, communications and outreach to citizens, and overall electronic access to government. *The bottom 40 countries show little relative progress.*

7. Access to both ICT and education infrastructure remains limited in the developing countries posing a constraint on e-government initiatives of Member States. As a result, despite efforts, countries are not able to utilize the full potential of either e-government or the ICTs for development.

8. Information and features designed to facilitate citizen participation and public input on governance –E-participation — have expanded considerably in the past year. ***However, progress is uneven and mostly limited to a handful of developed economies. Its full potential remains grossly under utilized for the majority of countries.***

9. In the current "e-environment," real Access-for-Opportunity is limited to relatively few in the world. Many developing countries and vast groups of the global population face a serious challenge in achieving their own knowledge society.

Conclusions:

⇒ *Underutilization of ICT for Development/E-Government:*

- Governments are still not fully cognizant of the centrality of ICTs to their development; especially in developing nations, but even among e-government leaders in developed nations; much more can be done to utilize ICT-for-Opportunity.

⇒ *Growing Access Divide*:

- One of the central obstacles in ICT-for-Opportunity is the current access-divide which appears across the world, not only in regions such as Africa where it is commonly perceived to exist, but also within individual countries due to the fact that in most countries only the well off currently have access to opportunity; these divides have to be bridged for regions and countries to reach full ICT-for-Opportunity capability.

⇒ *Increased Need to Focus on Knowledge Societies*:

- Governments need to re-think their development strategies towards building knowledge societies. A renewed commitment is needed to put ICTs within an integrated development framework to leapfrog the traditional long gestation phases of development and yield rapid economic and social progress for all.

III.2 Global E-Government Readiness Rankings

Table 3.1 and Graph 3.1 present the global E-government rankings for the top 25 countries for the world. Similar to last year, twenty-two of the 25 are from the high-income developed economies. All have scores which range 160 to 220 percent higher than the world average. The **United States of America** leads the 2004 global e-government readiness rankings as it did in 2003 with the highest index of **(0.913)** followed by **Denmark (0.905), United Kingdom (0.885)** and **Sweden (0.874)**.

The United States of America leads the 2004 global e-government readiness rankings as it did in 2003 with the highest index of (0.913) followed by Denmark (0.905), United Kingdom (0.885) and Sweden (0.874).

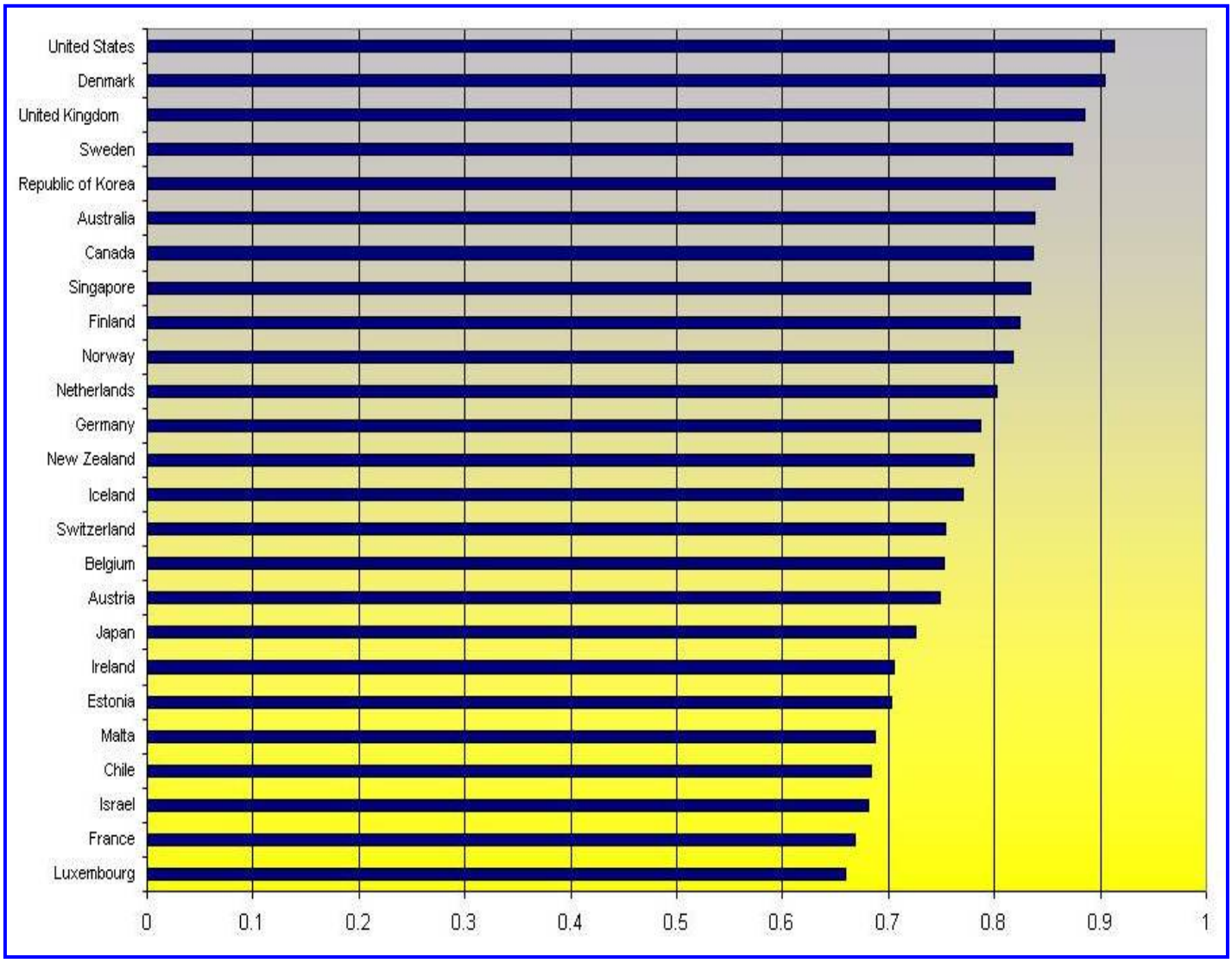
The region-wise ranking of the top 25 leading e-ready countries in 2004 mirror those in the 2003: 16 out of 25 countries are from Europe; 2 from North America; 3 from South and Eastern Asia; 2 from Oceania; and one each from Western Asia and South and Central America. No country from South and Central Asia or Africa made it to the list of top 25 e-government ready countries.

Among the top 25 world leaders in e-government there were a few surprises. **Denmark** gained 2nd position surpassing all developed countries except the United States (see table 3.2). Most notable was the performance of the Republic of Korea. Reflecting the considerable expansion and consolidation in its e-government program, the **Republic of Korea (0.8575)** fortified its rank from 13th position last year to arrive at the 5th position in 2004, which was higher than Australia, Canada, Netherlands and 10 other, mostly developed, countries. Another developing country, **Malta** (rank 27 in 2003), joined the ranks of the top 25. At 21st position in 2004, it surpassed Chile at 22nd and Israel at 23rd.

Table 3.1
E-Government Readiness Rankings 2004: top 25 countries

Rank	*Country*	*E-Government Readiness Index*
1	United States	0.9132
2	Denmark	0.9047
3	United Kingdom	0.8852
4	Sweden	0.8741
5	Republic of Korea	0.8575
6	Australia	0.8377
7	Canada	0.8369
8	Singapore	0.8340
9	Finland	0.8239
10	Norway	0.8178
11	Netherlands	0.8026
12	Germany	0.7873
13	New Zealand	0.7811
14	Iceland	0.7699
15	Switzerland	0.7538
16	Belgium	0.7525
17	Austria	0.7487
18	Japan	0.7260
19	Ireland	0.7058
20	Estonia	0.7029
21	Malta	0.6877
22	Chile	0.6835
23	Israel	0.6805
24	France	0.6687
25	Luxembourg	0.6600
	Average	*0.7798*
	World average	*0.4127*

Graph 3.1
E-Government Readiness, Top 25 countries 2004



The shuffle in rank between 2003 and 2004 primarily occurred in the developed countries. Though remaining among the top 25, **Switzerland** (-7); **France** (-5); **Norway** (-3); **Sweden** (-2); **Australia** (-3); and **Canada** (-1) all slipped in their ranks. **Italy** did not make it to the top 25 list in 2004.

While fortification in ranks of countries reflects greater effort and investment in e-government and ICT development, it should be noted that marginal changes in ranks are not that significant from year to year. Since telecommunications and human capital indices tend to change very slightly in a year, a small relative decline in rankings may not necessarily imply that the losers did less but that the gainers performed extremely well.

Table 3.2
Top 25 countries: Comparative E-Government Rankings 2003 and 2004

Country	*2004 rank*	*2003 rank*	*Change*
United States	1	1	0
Denmark	2	4	2
United Kingdom	3	5	2
Sweden	4	2	-2
Republic of Korea	5	13	8
Australia	6	3	-3
Canada	7	6	-1
Singapore	8	12	4
Finland	9	10	1
Norway	10	7	-3
Netherlands	11	11	0
Germany	12	9	-3
New Zealand	13	14	1
Iceland	14	15	1
Switzerland	15	8	-7
Belgium	16	23	7
Austria	17	21	4
Japan	18	18	0
Ireland	19	17	-2
Estonia	20	16	-4
Malta	21	27	6
Chile	22	22	0
Israel	23	24	1
France	24	19	-5
Luxembourg	25	25	0

III.3 E-Government Readiness by Region

Table 3.3 presents aggregate regional indices for the world. Supported by gradual improvements around the world, the global e-government readiness index increased from 0.402 in 2003 to 0.413 in 2004.

An important caveat about regional indices should be kept in mind when looking at this data. The regional e-government readiness and web measure indices given below are *aggregates on a relative global scale* and, as such, measure the performance of the group of countries relative to those in the rest of the world. A lower average regional index for this year compared to last does not mean that the region has performed worse than in 2003 but that some of the individual countries in other regions may have performed better. For example the lower e-government readiness index for Oceania (0.301) reflects the lower web measure assessment in 2004. A closer look at the countries comprising this region indicates that whereas half of the countries of the region such as Australia and New Zealand performed well, the performance of others such as Fiji and Tonga, was outranked by countries elsewhere, leading to a lower aggregate average for Oceania, as a whole. For individual country performance see sections below.

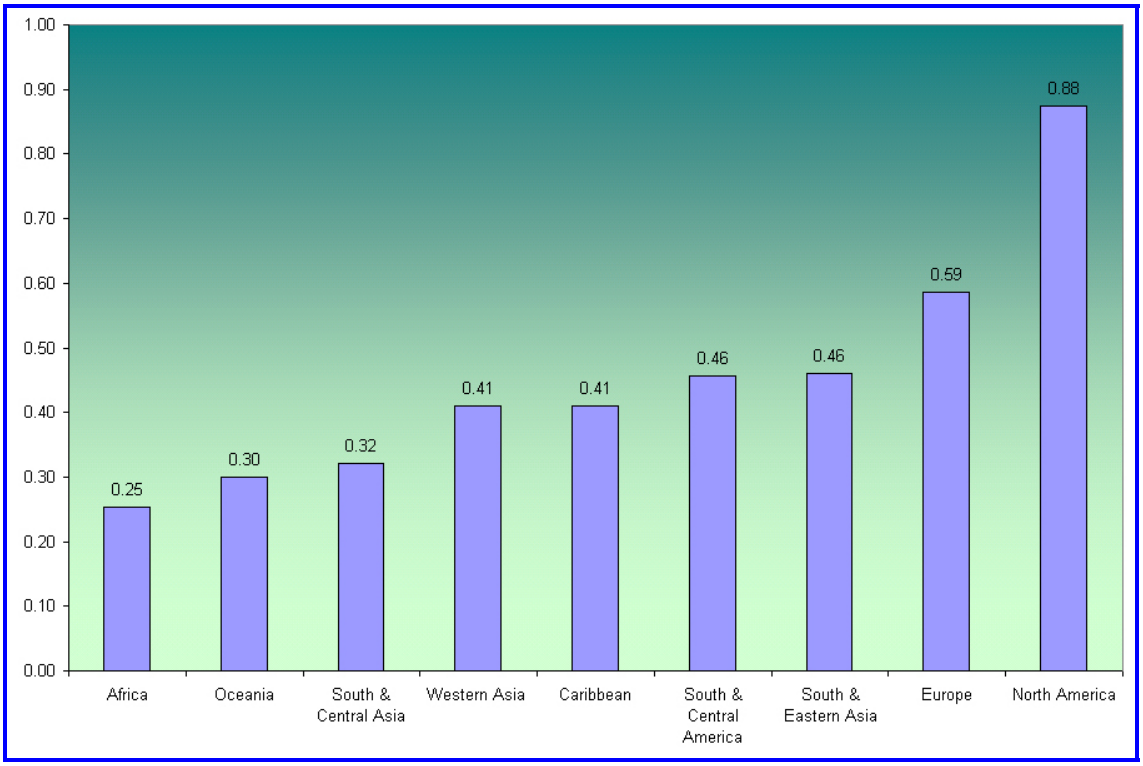
In terms of relative performance some regions did better than others. Again, North America and Europe were leaders in all four indices. The basic platform for this lead was provided by the advanced communication infrastructure in place in these industrialized countries and their commitment to education and knowledge. Collectively, these two regions were around 200-350 percent more e-ready than Africa the least e-ready region in the world. These disparities are presented in a tabular form below.

Table 3.3
Regional indices 2004

Region	*E-Readiness Index*	
	2004	2003
North America	0.8751	0.8670
Europe	0.5866	0.5580
South and Eastern Asia	0.4603	0.4370
South and Central America	0.4558	0.4420
Caribbean	0.4106	0.4010
Western Asia	0.4093	0.4100
South and Central Asia	0.3213	0.2920
Oceania	0.3006	0.3510
Africa	0.2528	0.2460
World Average	0. 4130	0.4020

In regional presentations, the Survey follows the "Composition of macro geographical (continental) regions, geographical sub-regions, and selected economic and other groupings" of the UNDESA Statistics Division. (http://unstats.un.org/unsd/methods/m49/,49regin.htm)

Graph 3.2
Regional E-Government Readiness, 2004



III.4 E-government readiness by country

Governments around the world are embracing ICTs, specifically the internet, to streamline public sector processes and provide citizens with easier access to government services. The importance of the role of ICTs in the global information society is being increasingly recognized with national strategies reflecting the importance of providing access to all.

North America

Table 3.4
E-Government Readiness Index, North America

	Index 2004	Global ranking in:		
		2004	**2003**	change
United States	0.9132	1	1	0
Canada	0.8369	7	6	-1
Average	0.8751			

A strong point of the US approach to e-government is its reliance on integrated portals.

As in 2003, the **United States** is the world leader in 2004 (0.913). In North America, as a region, it is followed by **Canada** (0.837). The United States national portal FirstGov http://www.firstgov.gov attracts around 6 million visitors a month. It is the nation's Gateway to more than 180 million web pages from federal and state governments, the District of Columbia, and U.S. territories. The stark contrast of how far advanced the United Sates is from the rest of the world is evident by the fact that the US alone, as a country, accounts for 29 percent of the global Internet access universe compared to the whole of Europe, as a region, at 23 percent, Asia-Pacific at 13 percent, and Latin America at two percent. [29]

A strong point of the US approach to e-government is its reliance on integrated portals. Several specialized portals, which collect and consolidate information in one place – online one-stop-shops – increase the effectiveness of finding topic-specific information for citizens while resulting in potential operational efficiencies for government agencies. Furthermore, recognizing the importance of involving the citizen early on in its endeavors towards a knowledge society the government of United States places strong emphasis on consultation and informed decision-making. Its approach to e-information, e-services and e-consultation can be dubbed a 'best practice case'.

[29] NUA. http://www.nua.ie/surveys/index.cgi?f=VS&art_id=905358729&rel=true

Box 4
A Best Practice Model in the United States

For e-consultation, relatively few countries, for example, score the feature of clearly including a response timeframe for submitted forms/emails. According to FirstGov, http://www.firstgov.gov/feedback/FeedbackForm.jsp, an answer will be provided for every submission within two business days which is comparable to the practices in the private sector. Few countries provide a formal online consultation facility; however, the U.S. not only provides one but has implemented an entire consultation portal (referred to as public comment/input in the U.S.) – a one stop site to comment on federal regulations, http://www.regulations.gov. For an overview, see http://www.whitehouse.gov/omb/egov/downloads/e-gov_initiatives.htm.

Like its neighbor to the south, Canada http://www.canada.gc.ca offers a wide variety of very impressive service and information portals. Among those, the "Consulting Canadians" site is one of the most impressive http://www.consultingcanadians.gc.ca reflecting *Canada's strong commitment to – and emphasis on – involving the citizen in participatory decision making.* A pilot project, now in its second version, it rivals any other formal feedback mechanism in the world. Similar to the U.S., Canada makes the extra effort to disclose a huge amount of information about its e-government initiatives on its Government On-Line initiative portal at http://www.gol-ged.gc.ca.

An illustration of the best practice approach on Canadian websites is the fact that it has integrated its public sector websites in a coherent and easy-to-navigate manner.

An illustration of the best practice approach on Canadian websites is the fact that it has integrated its public sector websites in a coherent and easy-to-navigate manner. This level of integration is still lacking in most nations, and is admittedly difficult to achieve for any nation – large or small, developed or developing. Especially interesting in the Canadian context is the obvious initiative to standardize all national level sites, using the same look and feel, and instituting standardized site architecture across all government sites, including subject specific information and service portals. Attention to content and language access for all is indicative of the importance attached by the government to extend the outreach of ICTs for all.

Box 5
Canada: A best practice approach to multilingual online information

Canada is an example of a best practice approach for multilingual online information illustrated on its national site which offers mirror pages in English and French. One of the most innovative features offered is the ability for users to completely customize their national site homepage according to personal preferences (see http://www.canada.gc.ca/canada/SCS?l=1&t=s). Far advanced than others, Canada offers another innovative feature is the mobile wireless access capability which tracks trends in technology http://www.canada.gc.ca/mobile/wireless_e.html.

The global leaders are successful due to a long standing enabling environment in terms of supporting infrastructure and human capital development. Along with successful e-government programs which reach the majority of the population these leaders have sought in the recent past to provide for greater institutional and regulatory structures coupled with varied initiatives for encouraging citizen awareness of – and participation in – the evolution towards a knowledge society. Successful e-government programs reflect the country's willingness to share information and knowledge with the people.

Europe

In Europe, the rankings in 2004 show only moderate changes, with generally the top 10 countries shuffling ranks among themselves. **Denmark** (0.905) emerged as number two in the world and the regional leader in Europe even surpassing **United Kingdom** (0.885) which was No.1 in 2003. They are followed by Sweden (0.874; 4th); **Finland** (0.824; 9th) and **Norway** (0.818; 10th).

Countries of Europe more or less maintained their progress fortifying their e-government and ICT for development programs. In particular, the countries fortified their e-participation programs. As a result, the regional average e-government index at 0.587 was higher in 2004 than 0.558 in 2003 reflecting that performance improved across a wide spectrum of countries and notably in the countries in transition. All, except three countries, in Europe improved their scores on an absolute basis. Portugal, Lithuania and Andorra declined slightly. Some others, such as Bulgaria and Croatia improved only moderately and hence, slipped in relative rankings.

Hungary (0.586); **Belgium** (0.753); the **Czech Republic** (0.621); and **Romania** (0.551) all improved their positions in 2004. Part of this improvement in Hungary's performance (by 11 points), could be

Table 3.5
E-government Readiness rankings, Europe

Country	Index 2004	Global ranking in:		
		2004	2003	Change
Denmark	0.9047	2	4	+2
United Kingdom	0.8852	3	5	+2
Sweden	0.8741	4	2	-2
Finland	0.8239	9	10	+1
Norway	0.8178	10	7	-3
Netherlands	0.8026	11	11	0
Germany	0.7873	12	9	-3
Iceland	0.7699	14	15	+1
Switzerland	0.7538	15	8	-7
Belgium	0.7525	16	23	+7
Austria	0.7487	17	21	+4
Ireland	0.7058	19	17	-2
Estonia	0.7029	20	16	-4
Malta	0.6877	21	27	+6
France	0.6687	24	19	-5
Luxembourg	0.6600	25	25	0
Italy	0.6598	26	20	-6
Slovenia	0.6506	27	28	+1
Czech Republic	0.6214	28	36	+8
Poland	0.6026	29	32	+3
Portugal	0.5953	31	26	-5
Hungary	0.5857	33	44	+11
Spain	0.5844	34	29	-5
Greece	0.5581	36	37	+1
Slovakia	0.5565	37	40	+3
Romania	0.5504	38	50	+12
Latvia	0.5486	39	48	+9
Bulgaria	0.5417	41	35	-6
Lithuania	0.5367	43	34	-9
Ukraine	0.5326	45	54	+9
Croatia	0.5227	48	39	-9
Russia	0.5017	52	58	+6
Belarus	0.4888	58	81	+23
Serbia & Montenegro	0.3871	87	89	+2
Bosnia and Herzegovina	0.3790	93	115	+22
TFYR Macedonia	0.3699	97	96	-1
Republic of Moldova	0.3446	106	95	-11
Albania	0.3400	110	114	+4
San Marino	0.2882	128	125	-3
Monaco	0.1970	152	150	-2
Liechtenstein	0.1937	155	154	-1
Andorra	0.1563	167	156	-11
Average	0.5866			

linked to efforts at expanding education as an important part of real access. Probably the most impressive site linked to Hungary's portal http://www.magyarorszag.hu is the Ministry of Education, http://www.om.hu which offers advanced features in the networked presence within an exceptionally functional and aesthetically pleasing design. Notably, it offers a comprehensive, 118-page document on e-learning, http://www.om.hu/letolt/nemzet/e-learning.pdf.

Even though its relative rank moved less dramatically **Belgium** http://www.belgium.be made an incredible advance compared to last year. Showing a strong commitment to the spread of publicly provided e-services, Belgium has amassed an enormous amount of information and services over the past year and has also entered the transactional and networked presence stages including offering many services in the health, http://www.health.fgov.be and social welfare http://www.socialsecurity.be.

Box 6
Belgium: a play of language for greater access

In an interesting example to expand language access, the Belgian national site http://www.belgium.be uses an interesting and useful language display. One gets to pick the language of choice and secondary language of choice. Say, if the user picks English, the site will note that while English is available it is not a complete translation and therefore asks in which language to display the remaining parts. While Dutch might do a visitor little good, it can be useful simply seeing where the missing parts are and what remains to be translated. It is noteworthy because it is the only such example the researchers came across while surveying all countries.

Malta (0.687; 21st) continued its progress from 2003 and improved all sites surveyed this year. Most impressive is the national site, http://www.gov.mt, which is an excellent portal that directs the user where to go using easy-to-use design. Malta has clearly advanced into the transactional stage with its online efforts and appears to be making an initial foray into networked presence. Its e-government program maintains that transaction services are the central focus of the nation's online efforts. Malta also offers to citizens a services/feedback portal, http://www.servizz.gov.mt, which features in particular an innovative "Progress Made" tracking system for monitoring e-government outreach.

The country which improved its performance the most in Europe was **Belarus** (0.489), gaining 23 positions in the rankings. This was spurred primarily by vast improvements in its social sector services, which included online public participation services.

Belarus http://www.government.by more than tripled its quantitative web measure score as compared to 2003. As was the case with many other countries that saw increases e-readiness, there was a strengthening of e-government offerings in Belarus. More features and services came online and agencies that were already online improved from 2003. While the country has yet to achieve consistency in the higher stages of development it clearly is showing a more mature online presence. By far the most impressive site is the Social Security Fund, http://www.ssf.gov.by. It covers most basic information and features, but also provides fairly substantial

networked presence features such as a web comment form, an open discussion forum, encourages citizen participation and offers an email sign-up option.
Though they have a long way to go other countries which performed well in 2004 included, among others, **Bosnia & Herzegovina** (0.379; +22); and **Romania** (0.550; +12). Many of this group of countries started to offer greater information and participation services.

With the help of funding from the e-Europe Action plan several countries of Eastern Europe are in the process of fortifying their e-services and expecting to leapfrog to e-health, e-learning, e-government applications, networking, and other web services. For example, health services such as prescriptions, medical websites and records are in the process of being linked throughout the region. The program is already at work in Poland, Hungary and the Czech Republic. Smart card manufacturers are also gearing up for the production of the European Health Insurance card, which EC legislation will make obligatory by 2008. As tuberculosis and HIV are health threats to the Central & Eastern European population projects are underway to share information about these diseases.[30]

Table 3.6
Investment in e-government in Central & Eastern Europe 2004-2010

	US $
EU Investment	36 billion
National and NGO investment	24 billion
TOTAL	60 billion

Source: 'British Publishers'. http://www.britishpublishers.com/news/index.htm

However, disparities among countries remain, with countries of Northern and Western Europe far more advanced than those of Eastern and Southern Europe, many of which remained constrained both by the lack of finance and infrastructure as they attempted to reform their economies. As can be seen from the table above most of the bottom 15 countries belong to Eastern Europe.

South and Eastern Asia

Due to an existing platform of a higher level of per capita income, human development and basic infrastructure than some other developing regions, most of the countries of South and Eastern Asia reported steady progress in 2004 and a higher than world average index for the region.

The regional leader was the **Republic of Korea** (0.858) followed by **Singapore** (0.834) and **Japan** (0.726): all three that appeared in the list of the top 25 global leaders as well. All three improved upon or maintained their relative positions in the global rankings in 2004. Korea improved by 8 points; Singapore by 4 while Japan was, relatively speaking, at the same position as in 2003. Among other notable gainers were **Thailand** (+6); **China** (+7) and **Mongolia** (+28). Nine out of 15 countries in the region had e-government readiness higher than the world mean.

[30] 'British Publishers'. http://www.britishpublishers.com/techsectors/ehealth.htm

Table 3.7
E-government readiness rankings: South & Eastern Asia

	Index 2004	Global ranking in:		
		2004	2003	Change
Republic of Korea	0.8575	5	13	+8
Singapore	0.8340	8	12	+4
Japan	0.7260	18	18	0
Malaysia	0.5409	42	43	+1
Philippines	0.5260	47	33	-14
Thailand	0.5096	50	56	+6
Brunei Darussalam	0.4632	63	55	-8
China	0.4356	67	74	+7
Mongolia	0.4152	75	103	+28
Indonesia	0.3909	85	70	-15
Viet Nam	0.3378	112	97	-15
Myanmar	0.3031	123	126	+3
Cambodia	0.2859	129	134	+5
Lao People's Dem. Rep.	0.2329	144	149	+5
Timor-Leste	0.0463	174	169	-5
Average	0.4603			

Both the Republic of Korea and Singapore offer examples of best practices in e-government readiness development. (See Boxes 7 and 8.)

Korea is clearly among the world leaders as evidenced by its rise to fourth position in the web measure ranking. The official Korean portal http://www.egov.go.kr was reorganized, improved, and expanded further in 2004. Its services 'tie' with the U.S. quantitatively in the first three stages. However, in the networked presence stage, considered to be more advanced, it does fall slightly compared to the other leaders. While Korea does provide an elaborate world-class networked presence, offering policy forums, customer surveys and opinion polls by agencies it currently lacks a formal advanced consultation mechanism for legislative purposes, though the development of such a formal mechanism is apparently planned.

Both the Republic of Korea and Singapore offer examples of best practices in e-government readiness development.

Singapore has truly fashioned its various information, services and consultation portals into an integrated whole – a model of a best practice approach. The Singapore Government Online Portal, http://www.gov.sg, is the national site gateway and while extremely user friendly and neatly designed offers little information in itself. Instead, in true portal fashion, it efficiently guides the user to the appropriate sites where the desired content and services can be found.

Box 7
Korea: A model approach to an integrated online portal

The Korean central services portal (http://www.egov.go.kr) proclaiming itself as the "Official Web Portal" and considered the main national site, is definitely one of the world leaders in tightly integrating online government services. The Government for Citizens (G4C) project was established to meet this specific demand of coordinating the national management services and providing citizens with a user-friendly one-stop shop online for increasing efficiency and user convenience. A remarkable success, the site provides, according to information at the site, guides for the 4,000 services that appear in the Civil Service Standards List. Further, a total of 393 services can be accessed online – from the initial application to the electronic issuing of results. While the site clearly focuses on services, including transactions, it also features a host of everyday information such as up-to-date news, calendar of upcoming events, archived information, useful links, and citizen feedback mechanisms.

In Singapore, the most notable portals are the e-Citizen and e-Consultation portals. These stand out as best practices and in no small part contributed to the country's overall advancement in the world in the e-government readiness ranking this year. The e-Citizen portal is clearly the result of a long-term integration strategy. The portal appears to live up to its name – "Your Gateway to All Government Services" – with an extensive array of services. The second national portal is the Government Consultation Portal. While clearly different in scope the site features e-consultation, provides replies to feedback, and has both guided and open discussion forums. The portal is clearly a best practice for citizen engagement and contributes greatly to the fact that Singapore is among the world leaders in e-government and e-participation.

Box 8
Innovative portals in Singapore

Singapore provides a number of interesting portals such as for improving government efficiency by cutting waste: http://www.cutredtape.gov.sg. Another example is the Customs' TradeNet portal, http://www.tradenet.gov.sg, which proclaims itself as the world's first nationwide electronic trade documentation system that approves permit applications almost instantaneously. Additionally, Singapore provides an enormously comprehensive business portal, http://www.business.gov.sg/.

Singapore is also home to some of the most highly rated public sector sites in the world. Best among those are perhaps the Ministry of Finance http://ww.mof.gov.sg, with its e-Business portal, http://www.gebiz.gov.sg/, and the Ministry of Manpower, http://www.mom.gov.sg. Even so, all ministries are of very high quality with most offering a wealth of information and advanced feedback mechanisms. For an example of excellent ministry-level online public consultations, see the section at Singapore's Ministry of Health site: http://www.moh.gov.sg/corp/eservices/econsultation/index.do.

Among other notable performers in South and Eastern Asia are **Mongolia** (+28), **China** (+7) and **Thailand** (+6). Even though its e-government offerings are still being developed, the greatest gain in rank was posted by Mongolia which advanced from 103rd in 2003 to 75th in 2004.

Mongolia's e-government efforts prove that stages of e-government need not be additive. Depending on their priorities and the political willingness countries can 'leapfrog' to higher more mature stages of service delivery…

Mongolia's e-government efforts prove that stages of e-government need not be additive. Depending on their priorities and the political willingness countries can 'leapfrog' to higher more mature stages of service delivery even bypassing transactional stages which require, among other, sophistication of financial systems. Despite initially taking incremental development steps towards e-government, the Mongolian national site http://open-government.mn in 2004 was one of the more interesting examples to be found. Unlike most other countries, the Mongolian site has advanced into the networked presence without the typical incremental coverage of all the basics. The e-participation mechanism includes an online legislative and online policy forum. Both are frequently used and appear to be very popular. In addition, on occasion, there is an "online conference" in which users are given the opportunity to chat directly – albeit electronically – with identified officials.

…China's e-government policy and strategy is an example of a best practice. It has taken an incremental approach to e-government service delivery with concurrent advances in infrastructure and development and access outreach.

China's consistent and steady improvements increased its e-government index from 0.416 to 0.435 and lifted it above the world mean. *Improving access of public services to more than a billion people at a pace that places it further ahead in global e-government rankings than last year is a major feat.*

In particular, *China's e-government policy and strategy is an example of a best practice. It has taken an incremental approach to e-government service delivery with concurrent advances in infrastructure and development and access outreach.* In the last few months China has been moving towards emulating the more successful examples of an integrated portal http://www.govonline.cn providing information and services. [31] As a testament to its step by step approach to building e-government for all, China has successfully fortified its information online but has yet to take the next step of two-way communication and information exchange, either transactional or participatory.

Thailand http://www.thaigov.go.th made impressive gains across all ministries and agencies surveyed and could advance even further given the number of interesting initiatives underway. For example, the central services portal, http://www.ecitizen.go.th (which was not available during the formal survey period but is online as of this writing) is an effective initiative to coordinate and integrate services and information, and the site is now also being promoted on other national sites, which bodes well for the future. Following an incremental development pattern its services in education, http://www.moe.go.th, (with its associated portal, http://www.mis.moe.go.th/) and labor http://www.mol.go.th have covered the basic two stages while also making an initial foray into networked presence, Stage V.

Other countries are in the process of enhancing their e-services. Like some other governments Malaysia's e-government initiative is designed to expand outreach of online services to citizens and build greater transparency and information flows. The Malaysian Administrative Modernization and Management Planning Unit (MAMPU) seeks to enhance the use of ICTs and has mandated that each government agency create an IT strategy to help facilitate greater communication between agencies and the public. [32]

Whereas South & East Asia illustrates several best practice cases it also has country cases, which reinforce the need for treating e-government as a priority and ICT for development as central to planning for the future. The cases exemplify the need for willingness to ensure consistency and build trust with the stakeholders.

In five countries of the region, including in Timor-Leste (0.046), Indonesia (0.391) and Vietnam (0.338) online provision of information and services to citizens declined in 2004. The significant drop for Timor-Leste (126th) was caused by the fact that it was lacking an online presence for each of the Education, Welfare, and Labor ministries. In Indonesia (70th) some of the interactive features last year were not available this year on the national as well as the education and health sites. In Vietnam (124th), hitherto provided educational information services in 2003 were not available at the time of research in 2004.

[31] At the time of the Survey research China's official site was http://www.gov.cn. This has been superceded by the new one.

[32] http://www.itu.int/osg/spu/wsis-themes/ict_stories/egovernment.html

South and Central America

Most countries of South and Central America made steady progress in 2004 and either maintained their relative positions in the global rankings or improved them. Around one third did not.

Compared to the rest of the world, countries such as Chile, Mexico, Peru and Argentina had the same relative world ranking in 2004 as in 2003. Others, such as Venezuela, Colombia, Honduras, Uruguay and Brazil improved. Suriname joined the league of countries offering e-government services. The regional e-government readiness mean was 0.446, which was above the world average reflecting progress, consolidation and improvements in e-government programs of several countries in the region.

Chile (0.684) was the regional leader followed by Mexico (0.596); Argentina (0.587) and Brazil (0.568). Chile, which was 22nd in 2004, was also the only South & Central American country to make it to the global top 25.

Table 3.8
E-government readiness rankings: South and Central America

	Index 2004	Global ranking in:		
		2004	2003	Change
Chile	0.6835	22	22	0
Mexico	0.5957	30	30	0
Argentina	0.5871	32	31	-1
Brazil	0.5675	35	41	+6
Uruguay	0.5481	40	47	+7
Colombia	0.5335	44	57	+13
Peru	0.5015	53	53	0
Panama	0.4907	54	62	+8
Venezuela	0.4898	56	93	+37
Guyana	0.4243	71	72	+1
Costa Rica	0.4188	73	66	-7
Belize	0.4150	76	71	-5
El Salvador	0.4034	79	80	+1
Ecuador	0.3924	82	85	+3
Bolivia	0.3863	88	78	-10
Suriname*	0.3474	105	..	..
Paraguay	0.3408	109	75	-34
Guatemala	0.3391	111	109	-2
Honduras	0.3301	113	124	+11
Nicaragua	0.3216	121	112	-9
Average	0.4558			

Note: Suriname was not online in 2003.

Leading an emerging trend in Latin America to make internet resources more citizen-oriented, Chile exemplifies "one stop shopping" http://www.gobiernodechile.cl which provides citizens with direct access to a variety of online services (see box).

Chile is also one of the only Latin American countries with fully functional website resources for English speakers (http://www.chileangovernment.cl/). *Chile's online e-government offerings rank among the world's best practice models because they not only provide a variety of citizen services and information, but do so in a user-friendly fashion that encourages citizen use.*

Chile's online e-government offerings rank among the world's best practice models because they not only provide a variety of citizen services and information, but do so in a user-friendly fashion that encourages citizen use.

In South and Central America, the greatest improvement was made by **Venezuela** (0.489) in the past year which was reflected in the jump from 93rd position in 2003 to 56th in 2004. A new national web portal was established in 2004 http://www.gobiernoenlinea.ve. A strong commitment to education is reflected in vast improvements in its education online services http://www.me.gov.ve which now rival those in the top 20 in the world. In addition to basic information the government offers interactive features such as user registration capability, a poll and open discussion forum, and a clear statement/policy encouraging public participation in education policy development.

Box 9
Chile e-government services: a simple and effective approach

Simplicity summarizes Chile's approach to e-government http://www.gobiernodechile.cl. The country homepage provides citizens with direct access to a variety of online services and information, including a National Online Employment Database (http://www.infoempleo.cl/) and an Interactive Consumer Affairs Center (http://www.gobiernodechile.cl/consumidor/index_orien_consumidor.asp).
In addition to direct links to these services, Chile's homepage provides user-friendly information on the President's daily agenda, one-click access to current legislation and important documents, easy access to regional governments and national ministry sites, and the list of services goes on and on. While many country websites provide this information, Chile has tailored the national homepage so that all online services and critical information are citizen friendly and one click away.

Colombia offered one of the most improved sites in the region http://www.gobiernoenlinea.gov.co for a one stop-shop e-government portal. **Honduras** made strides this past year advancing to 113th in 2004. Whereas in 2003 only the national site and one ministry were fully functional in Honduras this was expanded in 2004 as evidenced by their e-government online initiatives. Most impressive was the provision of education sector services to the citizen (http://www.se.gob.hn), where in addition to extensive information the user can find user-registration, a poll, an open ended discussion forum as well as a policy or statement encouraging participation. An example of an innovative exercise in education is the interactive map feature that shows where the schools are located in the country. **Brazil** has also made great improvements in its online services for the public. A one-stop-shop http://www.e.gov.br offers a good model for countries of the region. It is accompanied with an extensive e-procurement portal at http://www.comprasnet.gov.br.

Despite progress in the region, several countries in South and Central America remain at the initial few stages of developing their e-government programs with limited information on official websites and no links to Ministries where sectoral information could be available.

Caribbean

Countries of the Caribbean region continued to occupy ranks within the 59-120 range which placed them about average in the global rankings. A few countries among the top improved their positions marginally. Half of the countries of the region were above the world average. **Jamaica** (0.479) is the regional leader in the Caribbean followed by **Trinidad and Tobago** (0.467) and the **Bahamas** (0.465). While being placed in the bottom half of the rankings, **Barbados** http://www.barbados.gov.bb made the most significant improvements from 2003 to 2004 jumping 11 positions in the global rankings. Efforts at consolidation were reflected in the national site, which now provides several Stage II features including a government officials contact directory and various online forms for downloading in PDF format. The highlight, however, was the fact that Barbados offers a transactional presence albeit through the post office which is quite a feat for low scoring country. It is indicative of the commitment to e-services online in the country and bodes well for the future of e-government. Barbados exemplifies what countries can do even with limited resources.

Table 3.9
E-government readiness rankings: Caribbean

	Index 2004	Global ranking in:		
		2004	2003	change
Jamaica	0.4793	59	61	+2
Trinidad and Tobago	0.4670	61	65	+4
Bahamas	0.4649	62	64	+2
Saint Lucia	0.4616	64	59	-5
Barbados	0.4563	65	76	+11
Saint Kitts and Nevis	0.4231	72	67	-5
Dominican Republic	0.4111	77	60	-17
Dominica	0.3681	98	..	..
Antigua and Barbuda	0.3657	99	92	-7
Grenada	0.3588	102	100	-2
Cuba	0.3478	104	88	-16
Saint Vincent & St. grenadines	0.3239	119	111	-8
Average	0.4106			

Note: Dominica did not have an online presence in 2003.

Western Asia

The performance of countries belonging to Western Asia was mixed. While a little more than one third of the countries managed to stay in step with the rest of the world in terms of their e-government programs, the rest slipped behind. Iraq rejoined the online world community, though with a provisional portal.

Israel (0.681) had the highest e-government readiness in the region. Since 2003 it maintained its position in the world even advancing one point at 23rd. It was the only country from the region in the top 25 global leaders. The difference between Israel and **Bahrain** (2nd in the region) was large at 23 points. **Cyprus** (0.519), **Turkey** (0.489) and the **United Arab Emirates** (0.474) remained among the top 5 in the region and clustered around the 50th position in the global rankings.

Table 3.10
E-government readiness rankings: Western Asia

	Index 2004	Global ranking in:		
		2004	2003	change
Israel	0.6805	23	24	+1
Bahrain	0.5323	46	46	0
Cyprus	0.5189	49	51	+2
Turkey	0.4892	57	49	-8
United Arab Emirates	0.4736	60	38	-22
Jordan	0.4347	68	63	-5
Lebanon	0.4163	74	69	-5
Qatar	0.4005	80	77	-3
Armenia	0.3919	83	86	+3
Azerbaijan	0.3861	89	94	+5
Saudi Arabia	0.3858	90	105	+15
Georgia	0.3784	94	99	+5
Kuwait	0.3649	100	90	-10
Iraq a)	0.3566	103	..	..
Oman	0.2884	127	98	-29
Syrian Arab Republic	0.2644	137	133	-4
Yemen	0.1948	154	151	-3
Average	0.4093			

a) = Iraqi website was hosted by the Coalition Provisional Authority at the time of the Survey research. See Box.

As with most leading e-government sites and countries, Israel http://www.gov.il has both e-government and ICT policy and planning strategies available online for the benefit of citizens. A linked portal provides a one-stop shop for forms. However, the country's greatest online asset is arguably the "e-Payment Service" portal, http://www.ecom.gov.il, which does an excellent job of integrating all transactional capabilities offered across ministries and beyond. Using a great overview design of offerings users find online fee/tax/fine payments, license renewals, publications available for purchase as well as links to the post office, electric and phone billing sites. *This portal is a clear example of the value that good design, integration and information architecture for easy access can add to technology and software applications.*

Among others which posted gains in 2004 were **Saudi Arabia** (0.386), which improved its position by 15 points; and **Armenia** (0.392; 83rd), **Azerbaijan** (0.386; 89th), and **Georgia** (0.378; 94th).

Saudi Arabia http://www.mofa.gov.sa illustrates an approach followed by many countries in initial stages of e-government the world. Saudi Arabia does not have a true national government site or portal, but its overall sectoral presence online has expanded and improved dramatically in 2004. Whereas its overall e-government development is limited to initial stages notable improvements have taken place in information provision in Labor http://www.mol.gov.sa, Education http://www.moe.gov.sa, and Health, http://www.moh.gov.sa. Saudi Arabia is methodically moving down the path toward an integrated system of government sites that lacks only one thing – a true national portal.

Box 10
The Special Case Of Iraq

As reported in World Public Sector Report 2003, Iraq had online presence in early 2003; however, it was discontinued in April 2003 when the survey assessment was undertaken.

In 2004, Iraq offered a measured online presence via the Coalition Provisional Authority (CPA) website at http://www.cpa.gov. The site met all the technical requirements of what constituted a government site according to the research methodology. While it was acknowledged that this site could change or might become unavailable altogether it did meet all the technical requirements as to what constituted a government site. It was assessed along with the rest.

The measured site(s) for Iraq, though temporary, gave some valuable information and had notable features. The entry site offered mirror language versions in Arabic and English, procurement information, including instructions on how to bid via email, weekly reports, up-to-date press releases, as well as several fact sheets, background documents and laws.

Due to the dissolution of the CPA, the site(s) surveyed are, as of this writing, no longer being updated; however, the homepage notes that it will remain available for historical purposes until June 30, 2005. Meanwhile, Iraq's National Communications and Media Commission has petitioned the US-based Internet Corporation for Assigned Names and Numbers (ICANN) for control of the Iraq country domain (.iq).

There was a little progress in some other countries but not sufficient for them to keep in step with the rest of the world and maintain their relative position. Turkey, Lebanon, Kuwait, Syrian Arab Republic and Yemen all fortified their e-government services to the people but fell behind other countries in the world which are aggressively pursuing e-government and ICT development for capacity building and outreach for all.

A few countries of the region failed to maintain their momentum in 2004 and actually declined in total score in 2004. These include Oman (-29), UAE (-22), Jordan (-5), and Qatar (-3). One of the more solid countries for web presence in the 2003 Survey, Oman in 2004 declined 29 places in the global ranking. Its national site, www.omanet.com, and accompanying site for government tenders, www.tenderboard.gov.om, were highlighted as best practices in the 2003 Global E-Government Survey. However, neither of these sites was available during the 60-day survey period. [33] Neither were the Health, Welfare and Finance sector sites. Whereas countries should – and do – undertake site revisions, redesigns and major upgrades, it should be kept in mind that an important aspect of service delivery is building trust. Consistency, reliability and continuation of service to the citizen, however limited, will go a long way in providing assurance of commitment.

[33] Attempts were made throughout the period. After the survey period had closed, the Tenderboard site did open/work, but that the main site continued not to open correctly

In 2004, Egypt launched a new e-government central services portal, http://www.egypt.gov.eg/english/default.asp, which is a major first step in coordinating and integrating government information and services. Available in both Arabic and English, the user-friendly portal targets citizens, foreigners and businesses alike while offering services ranging from basic information to online payments. Facilities include requesting a birth certificate, paying a phone bill and renewing vehicle licenses online. Currently there is information related to more than 700 services on the portal and officials say they hope to add one new service a month to the site, aiming to have the majority, if not all, of government services online by 2007.

A major undertaking, three years in the making and a key part of Egypt's evolving e-government strategy, the creation of the central Egypt services portal is definitely a move in the right direction to integrate all government services into one online site. However, the new site has not been well integrated with or promoted at other Egyptian government sites; the integration of the site into the overall government online presence was non-existent during the survey period and as of the time of this writing. It is no doubt impressive that Egypt has reached such a stage of e-government maturity, but by overlooking the Best Practice of integrating the service portal into the overall government framework Egypt in effect failed to score additional points in the survey. The site simply could not be found or accessed by going online to other government websites – a user would have to have prior knowledge of the portal itself.

This underscores an important point. *Countries need to develop their e-government portals keeping in mind outreach, delivery and usability. Whereas a move towards specialized portals is commendable it should also be integrated within the official government portal.* There are many examples of the various approaches for integrating specialized portals and other government websites into an overall web *system*. For example, Malta has a services portal, which is a one-stop for services, integrated and linked to its national government site.

South and Central Asia

The governments of the region seem to adhere to a model of sustained and paced across-the-board e-government and ICT development.

The performance of the countries in the South & Central Asia region was unique inasmuch as *all* countries registered an improvement in absolute terms compared to last year. However, in the case of some countries the progress was slow to moderate, resulting in relative declines when assessed against other countries of the world. *The governments of the region seem to adhere to a model of sustained and paced across-the-board e-government and ICT development.*

Continuous efforts at consolidation of e-government websites and programs were made in South & Central Asia resulting in major improvements in the global rankings of about half of its countries, most notably in Kyrgyzstan, Kazakhstan and Pakistan. The region as a whole, though, was well below the world average e-readiness with some of the countries among the least e-ready countries in the world.

In 2004, **Kyrgyzstan** (0.447) did a remarkable job in improving its national web presence. It became the leading riser in the Survey, advancing 44 places in the global rankings. It also became the regional leader in South and Central Asia. It was

followed by **Kazakhstan** (0.434; 69th) at 2nd position in the region. Both of these countries have invested heavily in designing e-strategies and programs with an outreach message.

Kyrgyzstan's e-government initiative at http://www.gov.kg is an example of the *provision of e-services according to indigenous priorities and development plans*. Many of its e-government sites were repositories of greater information and services than was available previously in 2003. At the same time the country fortified its efforts to promote participatory services on more than half of the public sector sites surveyed. It added several portals including an ICT portal/section, http://www.ict.gov.kg. This is especially notable given Kyrgyzstan's economic status and relatively recent establishment of independent statehood.

Kyrgyzstan's e-government initiative at http://www.gov.kg is an example of the provision of e-services according to indigenous priorities and development plans.

Table 3.11
E-government readiness rankings: South and Central Asia

	Index 2004	Global ranking in:		
		2004	2003	Change
Kyrgyzstan	0.4468	66	110	+44
Kazakhstan	0.4344	69	83	+14
Maldives	0.4106	78	79	+1
Uzbekistan	0.3965	81	..	..
India	0.3879	86	87	+1
Sri Lanka	0.3748	96	84	-12
Turkmenistan	0.3409	108	106	-2
Iran, Islamic Rep. of	0.3282	115	107	-8
Pakistan	0.3042	122	137	+15
Nepal	0.2807	132	130	-2
Bangladesh	0.1788	159	159	0
Bhutan	0.1590	165	161	-4
Afghanistan	0.1337	171	168	-3
Average	0.3213			

Kazakhstan (http://www.president.kz) jumped 14 points in the global rankings surpassing India, Pakistan and other countries of the region with larger populations and more established institutional structures. Like other countries of the region, transactional and networked services are limited in Kazakhstan. However, the labor services provided online were improved and included an online open discussion forum (http://www.enbek.kz).

Pakistan's relatively new national portal – *Pakistan.Gov* (http://www.pakistan.gov.pk) aims at progressively making all services and information accessible through the portal. Emulating some best practices in the developed world it employs the tagline "The Official Web Gateway to the Government of Pakistan" aiming at a true one-stop citizen service in the future. Pakistan's improved position in the global rankings by 15 points is also explained by the establishment and further development of an associated e-forms portal, http://www.forms.gov.pk, which is a well developed site that displays the country's long-term vision of an integrated portal.

Pakistan's strategy of e-government development is a simple and illustrative model of steady incremental e-government development: In the first phase it sought to integrate all services and information across agencies in one place – a national portal. Second it consolidated all forms and government materials and made it available online in a standardized format for ease of use of the citizen. The next phases in the strategy are still under implementation. For example, while the forms portal has a huge number

Pakistan's strategy of e-government development is a simple and illustrative model of steady incremental e-government development.

of forms they are currently all in printable PDF format but not submittable online yet. Given its clearly outlined integration strategy and upcoming initiatives, which are also available at the site, Pakistan should continue its relative improvement in coming years.

Considerable progress was noted in the case of **Uzbekistan** (0.397)**.** Whereas Uzbekistan had no online presence in 2003 it has started to offer a central government information web portal, http://www.gov.uz, which is rich enough in information and services to place it 81st in the world index. While the site is "working in test mode" and as of the close of the survey period only provided modest information, it nevertheless represents a step forward. The government's efforts at ameliorating language barriers are evident from the mirror national site which provides content in native Uzbek, Russian, as well as English. Even at this pilot stage, the site encourages feedback with a web comment form, and includes clear and accessible contact information.

The new initiatives in e-government development by the government of Uzbekistan responds to the growing number of internet users in the country. The number of Uzbek users has doubled in the recent past. However around 73 percent of users are concentrated in the capital city of Tashkent and depend on internet café's for access. In a country of approximately 25 million, more than 100 cafes have sprung up in the Uzbek capital, compared with only one each in other smaller towns such as Karakalpakistan and the Surkhandarya Oblast. [34]

The very fact that Uzbekistan has gone from no web presence to a sophisticated central government portal approach in less than one year is a significant accomplishment in and of itself; it is also a clear illustration of what countries can accomplish in the utilization of e-government if they expend even modest levels of resources and planning efforts.

Other countries in South Central Asia are also in the process of putting their e-government systems in place. The e-Sri Lanka Action Plan (http://www.esrilanka.lk/) is expected to deploy e-government concepts with an emphasis on productivity and competitiveness, promote markets for employment generation, and enable socio-cultural integration of towards poverty reduction and the improvement of the quality of life and opportunities for all. The e-Sri Lanka project aims at building the implementation capacity, information infrastructure; developing ICT human resources, modernizing government; delivering citizen services, and leveraging ICT for economic and social development, through public-private partnerships.

[34] World IT Report.
http://www.worlditreport.com/main/index.ie.php3?sid=93619&lang=e&dir=home

Box 11
Afghanistan's Efforts at promoting ICT for development

Communications is considered the cornerstone of building a better Afghanistan by the new government. In October 2002, the Ministry published a national Telecommunications Development Strategy that outlines the key infrastructure development initiatives the Government seeks to broaden the base of the telecommunications infrastructure and bring it in line with requirements of the modern world (http://www.moc.gov.af/mocdoc/TelecomsDevStrategy-IGoct02.pdf).

The government has approved a sector development action plan; put in place a progressive policy and regulatory roadmap; and attracted an estimated $130 million in private investment. In October 2003, Afghanistan approved a comprehensive Telecommunications and Internet Policy in line with the Government's overall economic development and market liberalization goals. Throughout 2004 the Ministry of Communications will begin implementation of several major projects.

Source: Ken Zita. 'Afghanistan Telecom Brief'.
http://topics.developmentgateway.org/ict/rc/filedownload.do?itemId=1005701

However despite improvements, countries of the South and Central Asia region are far behind the world in almost all aspect of access to ICT for development. Despite progress, the lack of infrastructure and education is the most serious barrier to further expansion of e-government and ICTs for development. The enabling environment in many countries of the region is characterized by irregular or non-existent electricity supplies, especially outside large cities, telephones remain luxury items and internet access is available to only the privileged few in the upper income brackets. South and Central Asia is home to about 25 percent of the world's population but has a GDP per capita equal to 10 percent of the world average and 1.6 percent of the United States [35]. An estimated 30 percent of the 1.5 billion people in the region live in poverty on less than a dollar a day. [36] A major effort by the various stakeholders is called for if e-government and ICT for development is to harness opportunity for all in this region.

Oceania

Australia (0.838) is the regional leader among the group comprising Oceania with an e-government readiness at twice the world average. Together with **New Zealand** (0.781) they are among the top 25 global leaders in e-government.

Whereas a few countries improved their rankings the majority of Member States in Oceania, as a region, lost out to greater efforts in other regions of the world.

[35] UN Statistics Division database. http://unstats.un.org/unsd/snaama/SelectionQuick.asp
[36] Calculated from the World Bank PovCal database.
http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp

Table 3.12
E-government readiness rankings: Oceania

	Index 2004	Global ranking in:		
		2004	2003	change
Australia	0.8377	6	3	-3
New Zealand	0.7811	13	14	+1
Fiji	0.3912	84	68	-16
Samoa	0.3793	92	117	+25
Tonga	0.3781	95	82	-13
Solomon Islands	0.2700	134	122	-12
Papua New Guinea	0.2406	142	136	-6
Vanuatu	0.1618	164	162	-2
Micronesia *	0.0456	175	42	-133
Marshall Islands	0.0447	176	172	-4
Palau	0.0425	177	173	-4
Nauru *	0.0351	178	121	-57
Average	0.3006			

Note: The lower rank of Micronesia and Nauru is on account of their not reporting some key indicators which comprise the index.

The speed with which Australia redesigned the portals underscores how rapidly e-government developments take place, including complete re-designing and re-branding of even complex national portals as countries continue to enhance, refine, and standardize their online initiatives.

Overall, only the top two countries in the region, Australia and New Zealand, have e-government readiness indices above the global mean. The regional e-government readiness declined in Oceania from 0.351 in 2003 to 0.300 in 2004. The performance of several countries including Fiji (0.391), Tonga (0.378), Solomon Islands (0.270) and Papua New Guinea (0.241) was worse in absolute terms in 2004. In other cases, moderate efforts of countries such as Palau and Nauru were overtaken by countries elsewhere leading to a relative decline in their global rankings.

Like other top e-government countries in the developed world, Australia has merged its two overlapping portals, (http://www.fed.gov.au and http://www.australia.gov.au.), into the *Australia.Gov* integrated portal with a single entry point for all government information and services for citizens. [37] The speed with which Australia redesigned the portals underscores how rapidly e-government developments take place, including complete re-designing and re-branding of even complex national portals as countries continue to enhance, refine, and standardize their online initiatives.

Australia is home to several best practices and offers one of the most impressive online provisions of information and services. Its public sector online services include an amazing sub-portal for education, http://www.education.gov.au/, which is second to none. It also offered a national consultation website focused on schooling, http://www.nefs.dest.gov.au/, which is still online at this writing although the consultation period had ended. Finally, the Australian jobs portal, http://www.workplace.gov.au, continues in 2004 to be one of the best one-stops anywhere in the world and has even been improved. Providing comprehensive and up-to-date information about everything relating to the workplace, it is definitely a best practice in its genre.

[37] During the formal research period, Australia offered two, somewhat overlapping entry portals: http://www.fed.gov.au and http://www.australia.gov.au. At the time of this writing, however, the Fed.Gov portal has been merged into the Australia.Gov portal.

The New Zealand national site, http://www.govt.nz, is the model of a "classic" portal, which contains little stand-alone information or services, but rather guides citizens to useful government links and services in an easy-to-find manner. In 2004 the site added a formal online consultation facility which is an example of a best practice. *New Zealand has taken extra efforts to actively encourage and promotes its use to citizens, and does so not only at the national site, http://www.govt.nz/participate, but across all ministries and sub-sites. This kind of integrated implementation and promotion puts the online consultation section in an altogether different league, one shared by only a few other e-government innovators and leaders.*

Exemplifying a model approach to further access to education and skill development, the New Zealand government is strongly committed to improving the level and outreach of online educational information and services.

Exemplifying a model approach to further access to education and skill development, the New Zealand government is strongly committed to improving the level and outreach of online educational information and services. The Ministry of Education, which increased its appropriation for 2003/04, is investing in the development of innovative web portals, including e-learning initiatives in the tertiary sector. One innovative education portal, http://www.studylink.govt.nz/, allows students to apply online for financial assistance, including student allowance, student loan, or bursary payment. Another initiative is the Te Kete Ipurangi – the Online Learning Center, http://www.tki.org.nz – which is New Zealand's bilingual education portal and a project of the Ministry of Education. Also notable is the country's informative e-government portal, which provides a range of information about current initiatives as well as strategy documents (http://www.e-government.govt.nz).

Compared to 2003, **Samoa** http://www.govt.ws has improved its web presence visibly and its national site offers a neat homepage that is kept very up-to-date. Further, the much improved presence now includes information for all ministries, although only a few are afforded their own website. Most notable of those is the Ministry of Finance, which now has its own branded site, http://www.mof.gov.ws, that includes fundamental information, such as the national budget, and a range of basic online services such as printable forms. Even so, while Samoa ranks 4th in Oceania, it is far behind the two regional leaders, Australia and New Zealand, but well on track towards incremental e-government development and utilization.

Africa

While a few countries deemed regional leaders generally improved or maintained their global positions, the countries at the bottom e-government readiness in Africa trailed behind the rest of the world. With the e-government readiness rankings of 42 of the 45 countries below the world mean, the majority of the countries of the region were among the bottom 40% of all countries.

Despite belonging to the least e-ready region in the world, 15 out of 45 countries in Africa registered an improvement in their rankings; 26 declined in relative rankings. D.R. Congo and Côte d'Ivoire came online in 2004 even though their offerings remained limited. Even though at the lower end**, t**he largest gain was posted by Swaziland which jumped from 120th position in 2003 to 101st in 2004. Similar improvements were noted in the case of Malawi (+7), Congo (+ 7), and Mozambique (+7), among others.

In Africa, **Mauritius** (0.506) became the regional leader edging out South Africa this year which lost 10 places in the global ranking. **South Africa** (0.490), **Seychelles** (0.426); **Botswana** (0.383); **Swaziland** (0.365); **Cape Verde** (0.344) and **Uganda** (0.329) were among the top 10 in the region.

Notably **Mauritius** http://www.gov.mu was the only country in Africa with a developed online transactional presence illustrated by the new, Taxpayer Department, http://ltp.gov.mu/, which offered plenty of services, including e-filing of taxes after users register online. Many of the public services portals offer effective informational sites. The Labor ministry, http://labour.gov.mu/, features a "Live Vacancies" Job Bank for employment seekers, which was up-to-date. The Finance ministry offered at the time of this assessment e-filing of taxes. In 2004 further improvements were reflected in establishment of a pre-budget consultation website at http://mof.gov.mu/prebudget/prebudget.htm. Inviting the views of the citizen the government states '... our aim is to democratize further the budgeting process by reaching out to a broader spectrum of stakeholders. Underlying our political philosophy is the conviction that citizens in all walks of life should be given the opportunity to make constructive proposals on policy issues….' Related documents such as the legislation, government accounts, and the draft Budget were provided for the user. Overall, Mauritius has made great progress in all aspects of e-government, including the transactional and networked presence stages and duly deserves to be called the best in Africa.

Even though **South Africa** (http://www.gov.za) lost its dominant position in the region to Mauritius in 2004, it continued efforts at further development of e-government. The national site was being refurbished (as of the Survey period) and e-services were improved with the introduction of a central services portal, http://www.services.gov.za. South Africa's creation of this central services portal with its obvious mission of consolidating information and services across departments bodes well for its national web presence in future surveys, and more important, for its e-government efforts in the future.

Table 3.13
E-government readiness rankings: Africa

	Index 2004	Global ranking in:		
		2004	2003	change
Mauritius	0.5055	51	52	+1
South Africa	0.4902	55	45	-10
Seychelles	0.4259	70	73	+3
Botswana	0.3827	91	101	+10
Swaziland	0.3647	101	120	+19
Cape Verde	0.3442	107	113	+6
Uganda	0.3290	114	119	+5
Namibia	0.3272	116	104	-12
Lesotho	0.3250	117	102	-15
Algeria	0.3248	118	91	-27
Tunisia	0.3227	120	108	-12
Gabon	0.3002	124	123	-1
Congo	0.2970	125	132	+7
Kenya	0.2959	126	118	-8
Zimbabwe	0.2833	130	116	-14
United Rep. Of Tanzania	0.2830	131	135	+4
São Tomé and Principe	0.2774	133	128	-5
Malawi	0.2697	135	142	+7
Egypt	0.2653	136	140	+4
Morocco	0.2641	138	131	-7
Cameroon	0.2561	139	129	-10
Rwanda	0.2511	140	138	-2
Nigeria	0.2485	141	145	+4
Ghana	0.2369	143	139	-4
Senegal	0.2328	145	147	+2
Togo	0.2309	146	143	-3
Sudan	0.2308	147	146	-1
Madagascar	0.2214	148	144	-4
Benin	0.2204	149	141	-8
Mozambique	0.2029	150	157	+7
Angola	0.1998	151	148	-3
Djibouti	0.1967	153	153	0
D.R. Congo	0.1885	156	..	..
Comoros	0.1826	157	155	-2
Burkina Faso	0.1819	158	164	+6
Côte d'Ivoire	0.1729	160	..	..
Sierra Leone	0.1720	161	167	+6
Gambia	0.1710	162	158	-4
Mauritania	0.1696	163	160	-3
Burundi	0.1567	166	152	-14
Guinea	0.1423	168	165	-3
Chad	0.1399	169	..	..
Ethiopia	0.1365	170	166	-4
Mali	0.0956	172	163	-9
Niger	0.0623	173	170	-3
Average	0.2528			

Botswana's sites do not display any advanced online transactional features but they do prove that even incremental implementation of e-government can be highly successful if done professionally and strategically. While the national site, http://www.gov.bw, has remained virtually the same as in 2003, overall Botswana established the Independent Electoral Commission (IEC) presence, "The Road to 2004 General Elections" website, http://www.iec.gov.bw. Clearly linked from the main national site, it offers brief but clear descriptions on the voting process, including accompanying pictures, as well as registration instructions and complete

statistics. The development of such a site is a positive step towards greater government transparency and citizen participation alike. In 2004 the Finance Ministry started offering a stand-alone site, http://www.finance.gov.bw. Complete with a feedback form up front and several documents available for download, including tax forms, this site contributes to the greatly enhanced overall web presence of Botswana, which continues to improve one step a time.

Swaziland implemented and promoted a single entry access domain this year entitled the "online information portal" at http://www.gov.sz. Access to services was improved with five ministries online (except for education) compared to only one in 2003. The site features "Government tenders" which hints at a planned move to online procurement; however, the section contained no information or services as of the time of this writing. In **Malawi** the preliminary and static website of 2003 was expanded into an official government portal http://www.malawi.gov.mw in the past year with Ministries of Education, Health and Finance online.

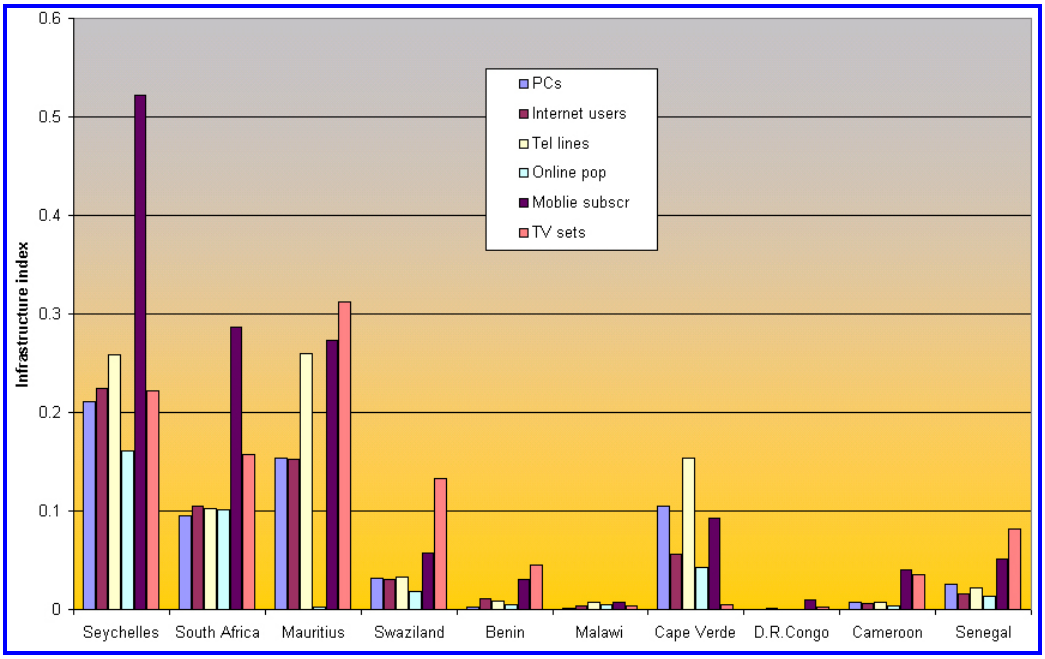
Some other countries are in the process of developing their programs. **Congo's** national site, http://www.congo-site.cg, is proof that incremental development can greatly enhance a country's web presence. Since launching the preliminary government site in 2003 Congo has made considerable gains in solidifying basic informational services online. While it is essentially the same site as in 2003, Congo added new and important information and features such as explicit contact information for the Ministry's of Education, Health and Finance. It also implemented an open-ended discussion forum and a number of other useful features. These modest, but important, undertakings have enabled Congo to quickly rise in the bottom half of the rankings, and promise to keep Congo on a path toward greater e-government utilization in the future.

Despite progress in e-government programs, access remains a serious issue in Africa with wide disparities between, and among, countries. The overall average e-government readiness index of 0.253 of Africa is only 61 percent of the world average and 29 percent of North America. So along with achievers there were a few countries, which did not perform well. Among others, **Namibia** (-12), **Lesotho** (-15), **Algeria** (-27), Cameroon (-10), and **Burundi** (-14) declined in 2004.

One of the primary sources of uneven performance in Africa can be traced to a wide disparity in basic infrastructure. Access to the internet in Africa remains limited. Of the 770 million people in Africa, one in every 150, or approximately 5.5 million people in total, now uses the internet, there is roughly one internet user for every 200 people, compared to a world average of one for every 15 people, and a North American and European average of about one in every 2 people. [38] As can be seen from the Graph 3.3 the lack of telecommunication infrastructure in Africa remains a serious constraint to the rapid adoption of e- government for all despite the spread of the Internet in the last few years.

[38] 'The African Internet - A Status Report'. http://demiurge.wn.apc.org/africa/afstat.htm

Graph 3.3
Access to ICT in Africa, selected countries 2004



In summary, the patterns of e-government development across the world illustrate the following:

i. To ensure ease of navigation leading e-government ready countries have adopted an integrated portal approach. Though many variants of this model exist the underlying theme reflects the governments' commitment to facilitate access to the citizen by making all information and services available through one-stop shop sites. Linked to the government online portals are the multiple specialized one-stop portals. The examples presented below illustrate some best practice approaches from around the world.

ii. Consolidation of e-government programs has taken the route of promoting awareness about policies and programs, approaches and strategies to the citizen, which lay down the foundation of an informed knowledge society. More and more information about education, health and employment is online.

iii. To expand citizen use of ICTs in development these governments are making public sector e-government websites accessible in the local language, interesting, and increasingly easy to use.

iv. The movement towards a knowledge society is evident in these governments' efforts to engage multi stakeholders in government decision-making. These governments have expanded participatory services online through the use of innovative specialized portals encouraging citizen feedback on important economic and social policy issues.

v. Broad trends of e-government development around the world in 2004 reaffirm that political ideology, economic and social systems; level of development; resource availability, human and technological infrastructure; institutional framework and cultural patterns all have a bearing on how, and how well, an e-government initiative is utilized.

Examples of some best practice approaches in the world

Country	*Best practice model for:*	*Location*
USA	One-stop portal of all recalls announced by the government	http://www.recalls.gov
USA	One stop shop for government forms	http://www.fedforms.gov
USA	Government Benefits	http://www.govbenefits.gov
USA	Student Aid	http://studentaid.ed.gov
USA	Employment	http://www.usajobs.opm.gov
USA	E-government	http://www.egov.gov
Canada	Canada's Business and Consumer Site,	http://www.strategis.ic.gc.ca
Canada	Job Bank	http://www.jobbank.gc.ca
Republic of Korea	The one-stop site for e-procurement	http://www.g2b.go.kr/
Singapore	True e-services one stop portal	http://www.ecitizen.gov.sg
Singapore	Comprehensive Government Consultation	http://www.feedback.gov.sg
Chile	A user friendly, Simple and effective approach	http://www.gobiernodechile.cl
Chile	Online Claims Center for Human Rights Violations	http://www.gobiernodechile.cl/defensa_ciudadano/defensa_ciudadano.asp
Chile	Interactive National Education Information Center	http://600.mineduc.cl
Brazil	One stop-shop portal	http://www.e.gov.br
Israel	All encompassing e-Payment Service	http://www.ecom.gov.il
Australia	Education	http://www.education.gov.au/
Australia	Comprehensive Job information	http://www.workplace.gov.au
New Zealand	Integrated portal	http://www.govt.nz
New Zealand	Innovative portal for online application of student loans	http://www.studylink.govt.nz
New Zealand	Innovative bi-lingual online Learning Centre,	http://www.tki.org.nz
Mauritius	Live Vacancies" Job Bank	http://labour.gov.mu/
Botswana	The Road to 2004 General Elections	http://www.iec.gov.bw

Chapter 4

IV. Web Measure Assessment

All across the world countries are adopting the use of ICTs to provide information, knowledge and services to their people. How well they fare is, among other things, not only a function of willingness and commitment but also the extent of diffusion of the ICT infrastructure and proliferation of education and skills throughout the society. Some of these composite patterns were captured in the e-government readiness rankings in the previous chapter.

Devoid of the context of access indicators, the web measure index is an assessment of how the countries use their e-government websites alone.

Notwithstanding the importance of access to infrastructure and the know-how of using ICTs in a country's readiness for the knowledge society, it is important to assess, in isolation, the governments willingness and ability to employ ICT for the provision of basic services. The web measure index is an assessment of this ability. Devoid of the context of access indicators, it is an assessment of countries on the basis of how they are using their e-government websites alone.

The following table shows the top 25 countries ranked by web measure index with the US as the comparator. It should be noted that ranks pertain to web measure assessments and are slightly different from the overall e-government rankings in the previous chapter which are based on a composite index comprising web measure, infrastructure and human capital assessments.

The first point to note is that except for 4, all of the top 25 countries are the same which made it to the list of the top 25 E-government readiness index presented in Chapter III. This indicates that the *global leaders have had a strategy of concurrent development of their e-government programs along with investment and expansion in technological and human development infrastructure.*

…global leaders have had a strategy of concurrent development of their e-government programs along with investment and expansion in technological and human development infrastructure.

Secondly, some countries, with developing economies and economies-in-transition, have made an incredible effort at improving e-government services. Although the majority of countries in the top 25 list are from industrialized economies, a number of developing countries are also rated as the best global e-government websites. Singapore (0.969), the Republic of Korea (0.945); Chile (0.994) and Malta (0.737) stand out as examples in 2004.

Effective investment in – and planning for – e-government programs in some other developing countries have also placed them in the vanguard in 2004 pushing France, Iceland, Luxembourg and Switzerland out. Four out of 5 countries, all from South & Central America, Mexico (0.783), Argentina (0.642); Colombia (0.641) and Brazil

(0.637) were in the top 25. Even though it slipped in ranking in 2004, Mexico's e-government services were rated better than Sweden, Belgium, New Zealand and the Netherlands. A few of the greatest advances are given in Graph 4.4.

Table 4.1
Web measure index 2004: top 25 countries

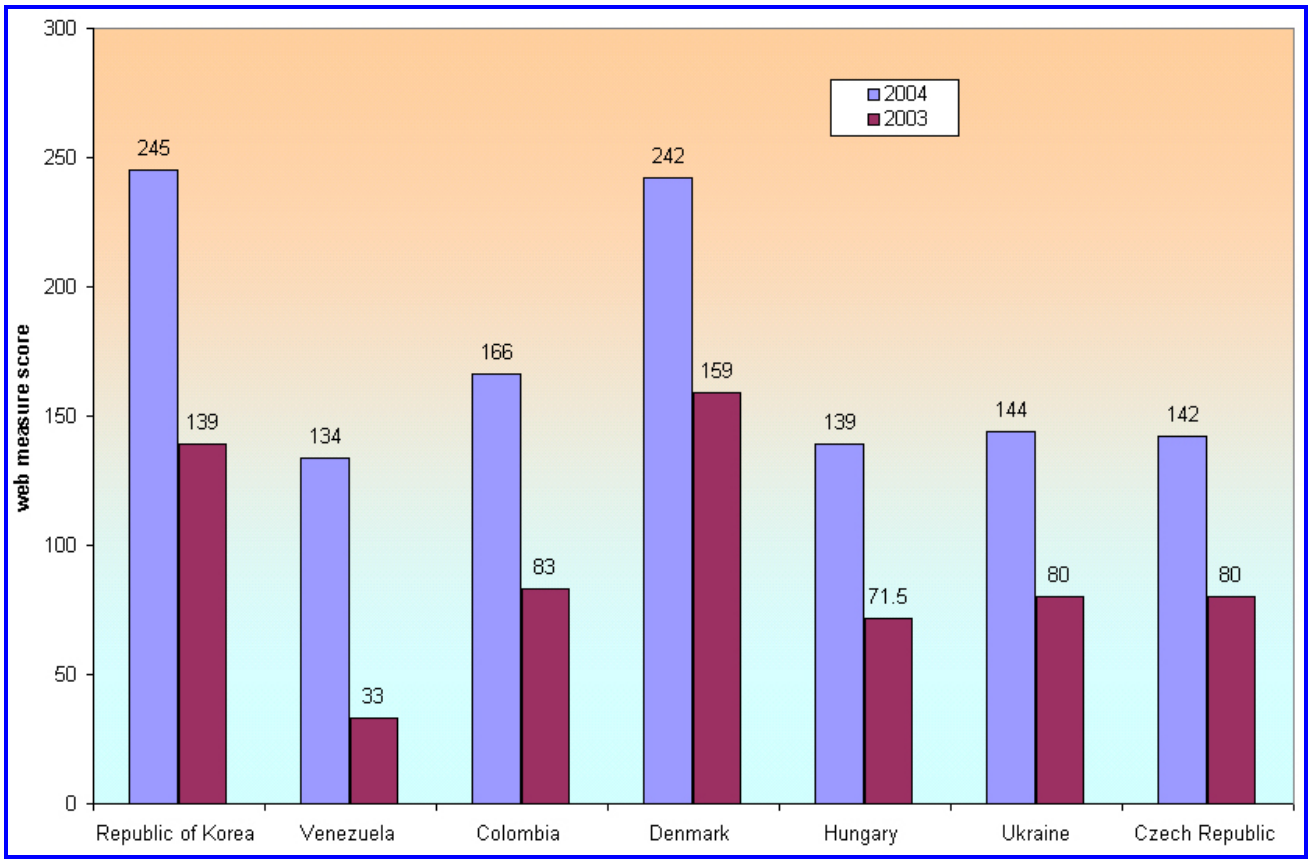
	Country	Index 2004
1	U S A	1.0000
2	United Kingdom	0.9730
3	Singapore	0.9691
4	Republic of Korea	0.9459
5	Denmark	0.9344
6	Chile	0.8842
7	Canada	0.8726
8	Australia	0.8301
9	Finland	0.8069
10	Germany	0.7954
11	Mexico	0.7838
12	Sweden	0.7722
13	Belgium	0.7722
14	New Zealand	0.7413
15	Malta	0.7375
16	Netherlands	0.7181
17	Estonia	0.6988
18	Austria	0.6988
19	Israel	0.6911
20	Norway	0.6873
21	Ireland	0.6564
22	Argentina	0.6429
23	Columbia	0.6409
24	Brazil	0.6371
25	Japan	0.6293

However, the fact that some of these South & Central American countries do not qualify for the overall e-government readiness index shows that despite considerable improvements in expanding and consolidating their e-government portals the effective outreach and access eludes the majority of the populations. With limited human and technological infrastructure support, many countries, which invest in e-government, tend to lose out in the set of world comparative rankings when assessed for overall e-readiness.

Whereas it is important to focus on improving access to service delivery, e-government programs must be placed in – and run concurrently with – an integrated framework aimed at improving infrastructure and educational skills.

This points to an important lesson in e-government and ICT for development planning. *Whereas it is important to focus on improving access to service delivery, e-government programs must be placed in – and run concurrently with – an integrated framework aimed at improving infrastructure and educational skills.* Countries may lose out on overall e-government readiness and their development goal of achieving access to all if the progress is not evenly balanced. For example Mexico, which ranked 11th among the top 25 in assessment of its e-government program alone, was ranked 30th when ranked by the composite e-government readiness index.

Graph 4.1
Greatest advances in e-government, 2004



IV.1 Online Features Of E-Government Programs

The importance of e-government online continued to grow as indicated from more countries opting to come online. In 2003, a total of 173 countries out of 191 countries were online in some form. This year's survey grew by a total of five countries to 178.

No online presence
Central African Republic; Democratic People's Republic of Korea; Equatorial Guinea; Eritrea; Guinea-Bissau; Haiti ; Kiribati; Liberia; Libyan Arab Jamahiriya; Somalia; Tajikistan; Tuvalu; Zambia

Out of those, seven have added an online presence in the past year: Chad, Côte d'Ivoire, Democratic Republic of the Congo, Dominica, Iraq, Suriname, and Uzbekistan. Two countries included last year were not online: Somalia and Zambia. For Somalia, no official government URL could be identified while the Zambian national portal did not open during the research period.

As in 2003, there was not much evidence of a linear progression in e-government stages. The majority of countries were found to be within the first three stages though some had sporadic features in the next two stages as well. The experience of most countries in progressing from one stage to the next was not strictly additive.

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Table 4.2
Online profile of UN Member States: year on year progress

	2004	*2003*	*Change*
UN Member States	**191**	**191**	**..**
With a government website presence	178	173	+5
With a single entry portal	63	45	+18
With online transactions provision	38	33	+5

Tracking the progress of the UN Member States from 2003 to 2004, a comparison of the overall profile of countries indicates that whereas 173 countries had a web presence a little more than one third maintained an integrated single entry portal, and only around 21 percent provided online transactions.

Table 4.3
Some common stage II characteristics of country websites

	2004	2003
Integrated single entry portal	35	26
Sources of archived information (laws, policy documents, etc.)	92	90
Databases (e.g., web access to/downloadable statistics)	85	79
Public services (true services and/or substantive service information)	37	36

Percent of countries

The above table indicates steady progress in the provision of key (Stage II-Enhanced presence) features during the past year. About one third of the countries have started to provide comprehensive integrated national portals, which provide a one-stop-shop window for easy access to all public services. Among these the example of Singapore stands out which has an integrated national portal linked to specialized e-services and e-government portals. In some other instances a separate e-government site/portal was a citizen services one-stop site and it was very well integrated into – and a part of – a 'national' portal site, while other times it was a stand-alone website, not integrated or even linked from a national site. Generally, specific 'e-government' portals focused only on the country's e-government policies, plans, regulations, etc. rather than actually providing any e-services.

Rapid progress in the initial stages of e-government development has led to other features being added in 2004. Around 85 to 92 percent of all countries online now provide some of the databases and or laws, policies and other documents. However, only about one third of all countries provided public services online: almost the same as last year.

Where a country does not score on Stage I but scores on Stage II it generally implies no integrated portal, no links to ministries or other national sites and limited static information on the national page. Among several others, examples of these countries are Paraguay, Qatar, and Turkmenistan. Still others have taken a step-by-step approach to building the national portal and adding services and products in a gradual fashion so that their e-government development programs almost mirror a

linear pattern. Sierra Leone, Micronesia, Bangladesh, and the Republic of Moldova have built up their presence in stages I to III but have not yet arrived at a more enhanced stage.

Broad trends … around the world in 2004 reaffirm that political ideology, economic and social systems; level of development; resource availability, human and technological infrastructure; institutional framework and cultural patterns all have a bearing on how, and how well, an e-government initiative is utilized.

As was stated in the last survey, the stage model of e-government is not necessarily additive. Broad trends of e-government development around the world in 2004 reaffirm that political ideology, economic and social systems; level of development; resource availability, human and technological infrastructure; institutional framework and cultural patterns all have a bearing on how, and how well, an e-government initiative is utilized. For example, many countries 'choose' to endow their official websites with public service delivery and public policy decision making facilities in line with their priority of engaging in an interactive dialogue with the citizen; others do not.

IV.2 Stages Of Services Delivery By Country

Despite considerable advancement, the progress appears to have been confined to the top echelon countries. Table 4.4 provides a breakdown of the number of top, mid-range and lowest scoring countries in 2004. A scant few – 18 out of 178 countries – were in the highest scoring 66-100 percent utilization bracket with another 47 in the mid range. One hundred and fourteen – or more than two thirds of all UN Member States – were in the bottom one third utilization category (see Graph 4.2). Details on all Member States appear in Appendix table.

Overall, countries reached ever closer to … enhancing e-government services online with the top 10 countries offering between 76-95 percent of the services and products measured in this survey. Compared to … last year this indicates major progress in moving towards more interaction in providing services and the opportunity for the citizen to participate in public policy decision making.

Overall, countries reached ever closer to their goals of enhancing e-government services online with the top 10 countries offering between 76-95 percent of the services and products measured in this survey. Compared to the range of 60-87 percent last year this indicates major progress in moving towards more interaction in providing services and the opportunity for the citizen to participate in public policy decision making.

Furthermore the gap between the top 15 was reduced; Argentina which was 15th in 2003 utilized around half of the potential in 2003. In 2004, Argentina had improved its services moderately to 63% of the full potential but had slipped to the 21st position. Malta, which had the 15th position in 2004, had already enhanced its services to provide 70 percent of the total.

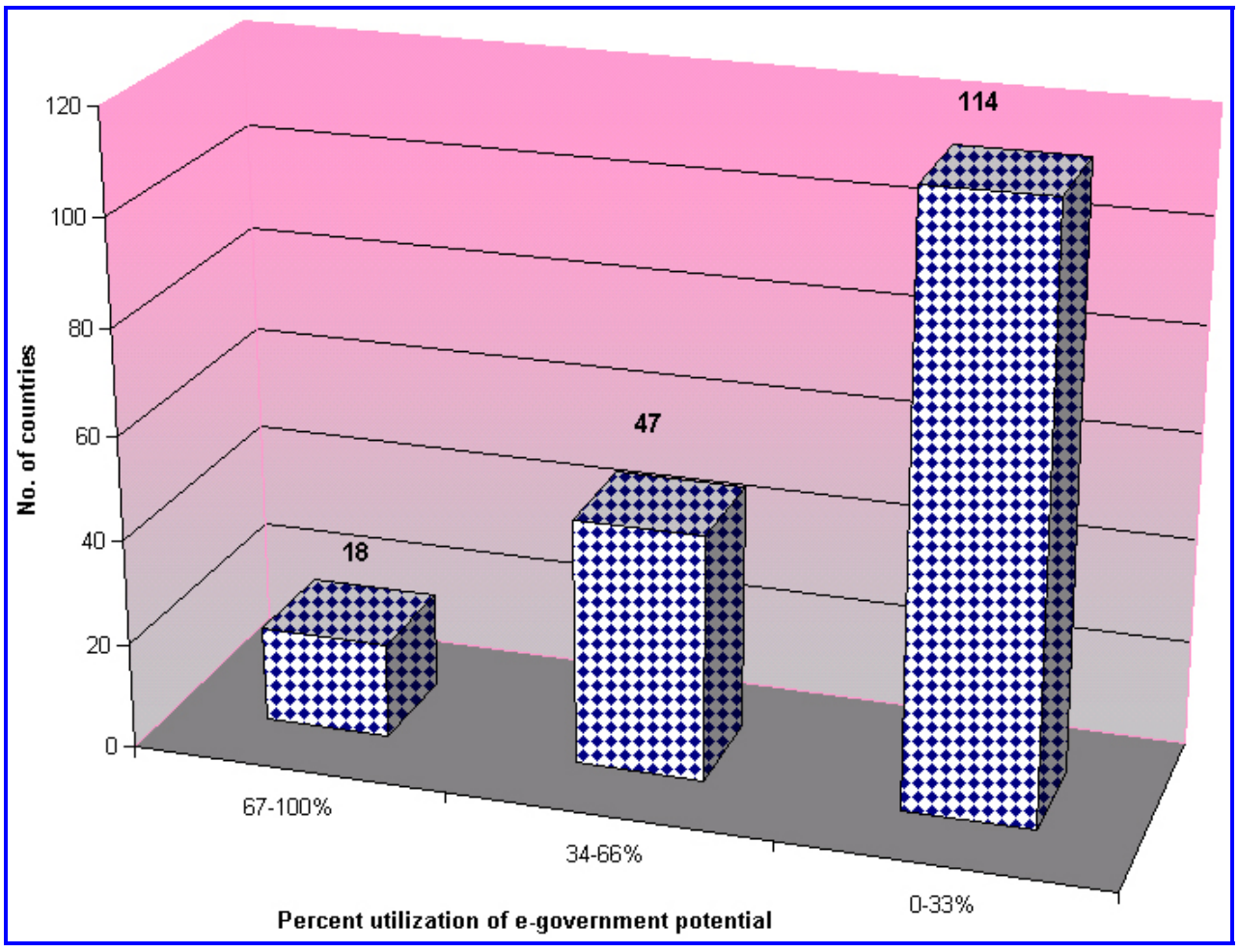
Table 4.4
Scores by delivery stages, selected countries

Stage	I	II	III	IV	V	Total I-V
Top scoring countries (percent utilization = 67 -100%)						
United States of America	100	100	100	93	78	95
United Kingdom	100	98	94	93	78	92
Singapore	100	95	99	85	78	92
Republic of Korea	100	100	100	71	69	89
Denmark	100	95	95	80	70	88
Chile	100	94	89	71	65	84
Canada	100	99	87	56	67	82
Australia	100	93	92	61	44	78
Finland	100	93	94	56	33	76
Germany	100	91	93	56	33	75
Mexico	100	90	83	41	56	74
Belgium	100	90	81	41	54	73
Sweden	100	100	80	27	50	73
New Zealand	100	90	82	32	44	70
Malta	100	97	85	29	30	70
Mid-range scoring countries ((percent utilization = 34 - 66%)						
Austria	88	94	77	29	28	66
Israel	100	92	75	39	22	65
Norway	100	98	71	20	31	65
Argentina	100	90	74	29	24	63
Brazil	100	85	69	44	13	60
Japan	100	92	64	27	19	59
Philippines	100	74	70	27	20	56
India	100	74	70	17	17	54
France	100	91	40	15	24	51
Thailand	88	79	50	0	37	50
Pakistan	100	75	52	0	11	45
China	75	66	46	0	6	38
Kyrgyzstan	100	64	35	2	15	37
Russian Federation	100	57	39	0	19	37
Spain	100	69	39	0	0	37
Lowest scoring countries ((percent utilization = 0 - 33 %)						
Jordan	88	49	46	0	2	33
Indonesia	100	53	19	0	26	31
Saudi Arabia	0	55	31	0	11	29
Sri Lanka	100	37	30	7	4	26
Cyprus	75	39	23	0	4	22
Barbados	88	26	18	10	4	19
Iran (Islamic Republic of)	63	24	18	0	2	15
Namibia	75	10	20	0	0	12
Egypt	0	21	10	0	0	9
Bangladesh	88	15	0	0	2	8
Oman	0	8	7	0	0	5
Syrian Arab Republic	0	9	6	0	0	5
Guinea	13	2	5	0	0	3
Zimbabwe	13	5	0	0	0	2
Mali	0	1	2	0	0	1

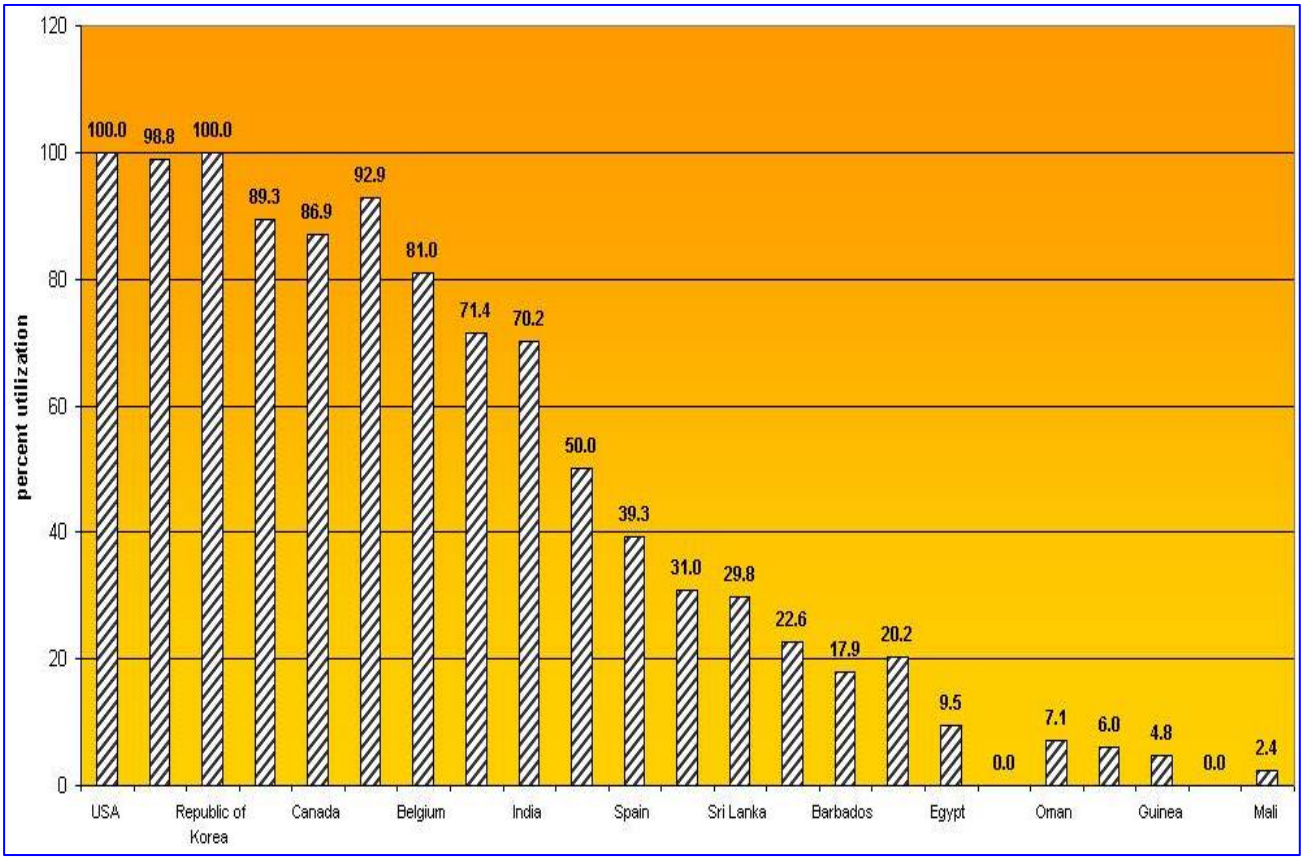
Note: For the complete set of countries by groups see Annex table.

The greatest progress was made in stages III, IV and V. In 2004, except for 6 countries (Bangladesh, Saint Vincent and the Grenadines, Grenada; Comoros, Zimbabwe and Niger) all of the remaining 172 countries provided some of the interactive services in Stage III on their e government websites, albeit with wide differences. Whereas countries in the top utilization bracket such as the United States, the United Kingdom, Singapore and the Republic of Korea provided 100 (or close to a 100) percent of interactive services, Mauritania, Togo and Burundi provided a mere 2 percent. Graph 4.3 presents a breakdown of the percentage of countries providing interactive (stage III) features online.

Graph 4.2
E-Service delivery utilization



Graph 4.3
Interactive services, selected countries



Another measure of the progress in 2004 was that the number of countries offering some of the two-way interaction features of Stage IV rose from 28 in 2003 to 38 in 2004. Among the top 5 countries, the United States, United Kingdom, Singapore and Denmark further increased the availability of transactional services with their utilization ratios rising to 80 -93 percent. Graph 4.5 presents the progress in various transactional services for the top 15 countries. As can be seen the most spectacular jump was in the performance of Belgium where transactional services on the government website jumped from a mere 2 percent in 2003 to 41 percent in 2004. No less spectacular were Korea, New Zealand and Finland.

Notwithstanding this improvement, *a fuller spectrum of transactional services online, however, has remained limited to mostly the developed countries*. Whereas more than three fourths of countries (170 countries) allow for down loading of forms for services such as drivers license, etc., only 18 percent (32 countries) offer the citizen the facility of making payment by a credit card. Graph 4.4 below gives a detailed picture of the number of countries providing the various interactive features.

…a fuller spectrum of transactional services online, however, has remained limited to mostly the developed countries.

Graph 4.4
No. of countries providing Interactive and transactional features

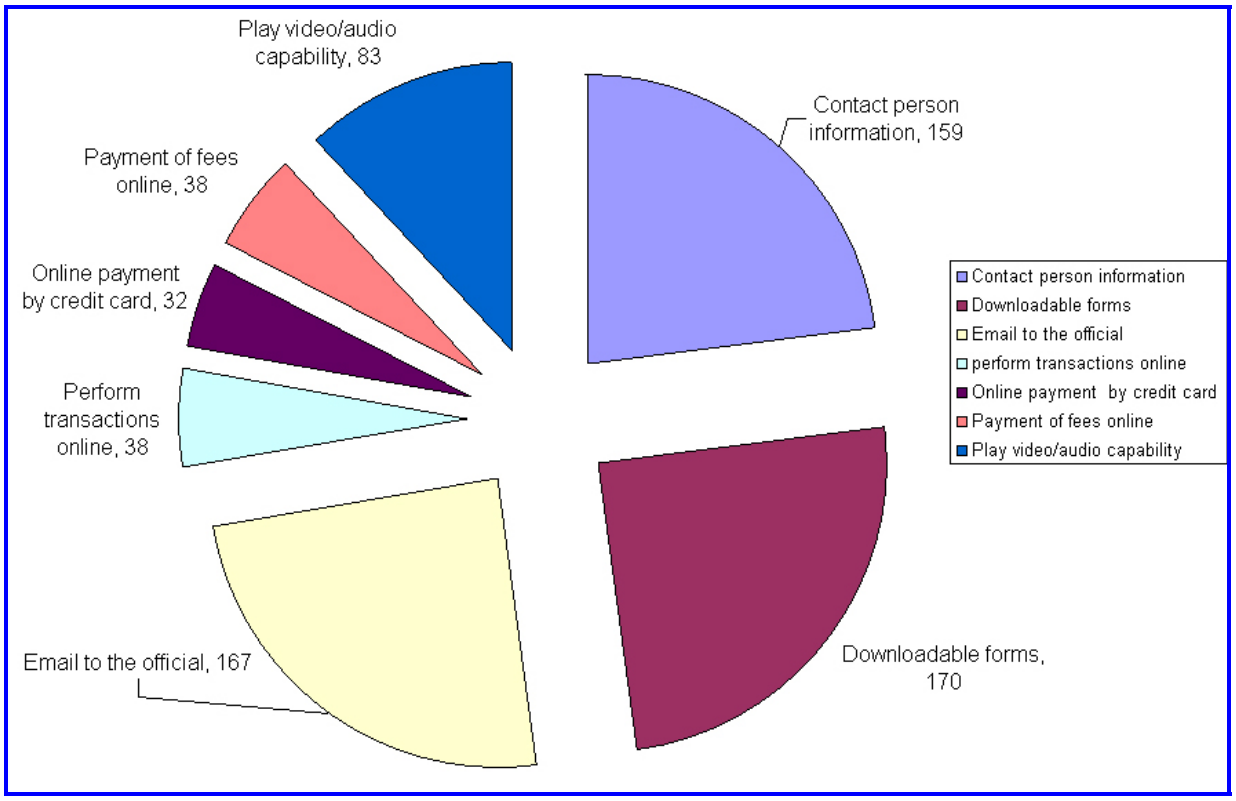


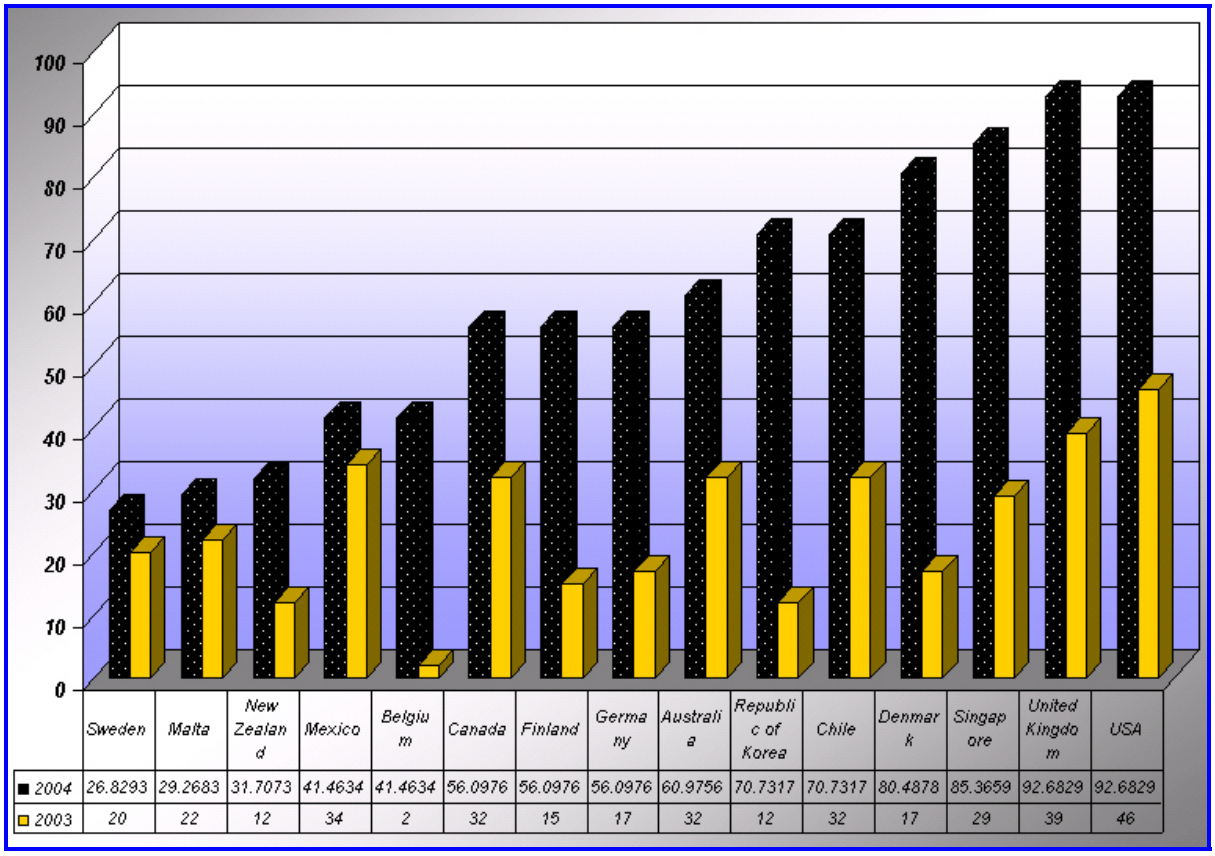
Table 4.6 presents the 38 countries that offer Stage IV features in descending order of the number of online transactions available on the national and the six ministry sites. United States, United Kingdom, the Republic of Korea and Singapore offered several transactions online including payment for taxes, violations/penalties, postal services on both their national and ministry sites. Others less so. Some were in the very initial stages of offering any kind of service online. For example, in Sri Lanka the payment of postal services was being offered in a pilot program only with the option of payment by credit card.[39]

Table 4.5
Countries offering online transactions

	Country
1	United States
2	United Kingdom
3	Singapore
4	Republic of Korea
5	Chile
6	Canada
7	Denmark
8	Israel
9	Australia
10	Belgium
11	Brazil
12	Finland
13	New Zealand
14	Argentina
15	Germany
16	Ireland
17	Mexico
18	Netherlands
19	Sweden
20	Austria
21	Estonia
22	Japan
23	Malta
24	Mauritius
25	Norway
26	Philippines
27	United Arab Emirates
28	Uruguay
29	Barbados
30	France
31	India
32	Malaysia
33	Romania
34	Greece
35	Guatemala
36	Italy
37	Panama
38	Sri Lanka
	21% of total countries

[39] Since then the pilot phase has ended. The site at http://www.lanka.net/slpost was not operational at the time of writing this survey.

Graph 4.5
Transactional services: top 15 countries



	Sweden	Malta	New Zealand	Mexico	Belgium	Canada	Finland	Germany	Australia	Republic of Korea	Chile	Denmark	Singapore	United Kingdom	USA
2004	26.8293	29.2683	31.7073	41.4634	41.4634	56.0976	56.0976	56.0976	60.9756	70.7317	70.7317	80.4878	85.3659	92.6829	92.6829
2003	20	22	12	34	2	32	15	17	32	12	32	17	29	39	46

A comparison of progress

In 2003 the top 14 countries provided services in all 5 stages; in 2004 this had doubled, with the top 28 countries providing some services across all 5 stages. Some countries seemed to have focused on improving enhanced public governance and efficiency by focusing on providing more two way services online. For example, in 2003 Netherlands and Argentina, which ranked 11th and 31st provided zero transactional services to its citizens; in 2004 a full 27% and 29% of the transactional services, respectively, were online in these two countries.

An important finding of last year's Survey was that not many countries utilized the full potential of e government to provide information and services to their citizens. *This still holds for the majority of the countries.*

An important finding of last year's Survey was that not many countries utilized the full potential of e government to provide information and services to their citizens. This still holds for the majority of the countries.

What is different in one year is that the handful of developed countries, which until last year were providing only some transactional services, surged forward. Their utilization levels rose tremendously.

Government website assessment in the lowest 40 countries

Of the 114 countries, the bottom 40 showed little progress. In 2003 the lowest 43 countries had 10 percent or lower utilization of the full potential of e-government (see table below). This remained more or less the same in 2004 with 41 countries still utilizing 10 percent or less. The online profile of these countries indicates that their e-government initiatives are limited to providing basically static national websites with some links to other ministerial sites and a few downloadable features. Most of these were not frequently updated. Where provided, the range of interactive services remained limited to some downloading, and phone, fax and email contact information. None of these 40 countries provided any transactional services and most had a very rudimentary networked presence at best.

Table 4.6
Countries with lowest percentage utilization
Range 0 - 10 %

	Stage	I	II	III	IV	V	Total I-V
1	Paraguay	0	20	13	0	0	10
2	Solomon Islands	0	15	18	0	0	10
3	Egypt	0	21	10	0	0	9
4	Sierra Leone	75	11	8	0	6	9
5	Micronesia (Federated States of)	75	11	11	0	0	9
6	Cuba	50	17	6	0	0	9
7	Marshall Islands	38	8	14	0	4	9
8	Republic of Moldova	75	10	7	0	4	8
9	Qatar	0	17	8	0	0	8
10	Bangladesh	88	15	0	0	2	8
11	Gabon	0	14	10	0	0	7
12	Gambia	38	10	7	0	4	7
13	Madagascar	38	9	7	0	6	7
14	Mauritania	88	9	2	0	4	7
15	Dominica	0	9	8	0	6	7
16	Turkmenistan	0	10	7	0	4	6
17	Djibouti	13	8	8	0	2	6
18	Lao P.D.R	0	6	12	0	0	5
19	Democratic Republic of the Congo	13	10	4	0	2	5
20	Nauru	0	8	8	0	0	5
21	Yemen	0	9	7	0	0	5
22	Ghana	0	9	6	0	0	5
23	Oman	0	8	7	0	0	5
24	Suriname	0	8	7	0	0	5
25	Syrian Arab Republic	0	9	6	0	0	5
26	Togo	38	8	2	0	2	5
27	Saint Vincent and the Grenadines	0	10	0	0	6	4
28	Vanuatu	25	6	6	0	0	4
29	Bhutan	0	5	7	0	2	4
30	Côte d'Ivoire	0	9	1	0	2	4
31	Antigua and Barbuda	25	0	8	0	0	3
32	Burundi	25	6	2	0	0	3
33	Grenada	13	9	0	0	0	3
34	Comoros	63	2	0	0	2	3
35	Ethiopia	0	6	2	0	0	3
36	Guinea	13	2	5	0	0	3
37	Zimbabwe	13	5	0	0	0	2
38	Mali	0	1	2	0	0	1
39	Niger	0	3	0	0	0	1
40	Sao Tome and Principe	0	0	2	0	2	1
41	Chad	13	0	1	0	0	1

In summary, the patterns emerging from the above assessment are the following:

i. E-government programs are built on the foundations of advanced platforms of access opportunities.

ii. Despite improvements, mature Stage III to V online services remain limited to mostly the developed countries.

iii. Still not many countries are utilizing the full potential of e-government to provide information and services to their citizens.

iv. Whereas it is important to focus on improving access to service delivery, e-government programs must be placed in – and run concurrently with – an integrated framework aimed at improving infrastructure and educational skills.

v. To improve Access-for-Opportunity countries must recognize the centrality of ICTs in all development planning and encourage the use of ICTs by making more services available through their e-government initiatives.

Chapter Five

V. The Extent of E-Participation

Qualitative assessment surveys, despite carrying an inherent risk of subjectivity, are useful inasmuch as they inform about the usefulness of the information and services provided. Whereas the web measure index assesses the availability of information and services online, the e-participation index measures 'how useful' are these services and frequently they appear. In particular, the index attempts to qualify if these tools and materials are conducive to an online deliberative and participatory process between the government and the citizen.

Table 6.1 presents the e-participation rankings for the top 20 countries. **United Kingdom** scores the highest followed by the **United States** (0.934); **Canada** (0.902) and **Singapore** (0.836).

Whereas the web measure index assesses the availability of information and services online, the e-participation index measures 'how useful' are these services and frequently they appear.

It is interesting to note that, by and large, the rankings closely mirror the e-government readiness and the web measure index underscoring that this same group of developed economies, along with a few developing countries, is in the vanguard of incorporating ICT into the overall pattern of development for all. Barring a few newcomers the same set of countries shuffle among the top 20 positions. Building on an existing solid infrastructure and human capital base, their e-government and ICT action plans are aimed at expanding the reach – and utilization – of information and services towards the goal of a knowledge economy. Notwithstanding **Colombia,** (0.623) **Belgium** (0.607)**, Malta** (0.459) and **Austria** 0.443) which have been in the process of expanding the outreach of their e-government programs recently succeeded in consolidating their participatory services to citizens and improving the quality and quantity.

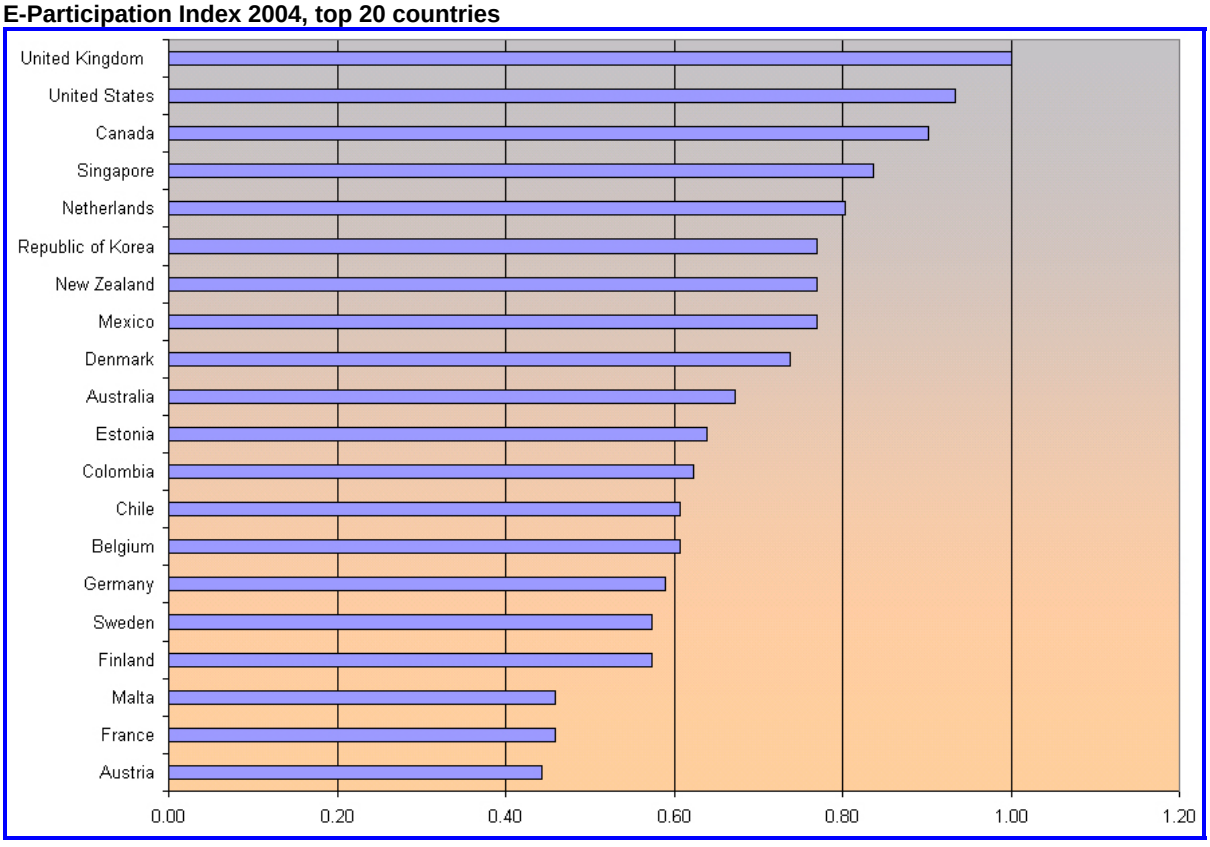
Individual country rankings should be considered within the perspective of the overall development perspective. Investments and consolidation of e-government programs may result in improving the performance and ranking of a country in the year that such services become available pushing others down. Year over year marginal gains/losses in rankings are less meaningful than an overall assessment of where the country is headed in terms of its ICT development and the focus of e-government action plan.

As in terms of the quantity, the quality of e-participation services offered differs across countries. Only a handful of countries appear to have invested in providing quality participatory services. Most still relied on expanding technical features which would allow some online feedback.

Table 5.1
E-Participation Index 2004: Top 20 countries

Country	Index	Rank 2004	Rank 2003	Change
United Kingdom	1.000	1	1	0
United States	0.934	2	2	0
Canada	0.902	3	3	0
Singapore	0.836	4	13	+9
Netherlands	0.803	5	7	+2
Mexico	0.770	6 (tie)	9	+3
New Zealand	0.770	6 (tie)	5	-1
Republic of Korea	0.770	6 (tie)	12	+6
Denmark	0.738	7	15	+8
Australia	0.672	8	8	0
Estonia	0.639	9	4	-5
Colombia	0.623	10	56	+46
Belgium	0.607	11	37	+26
Chile	0.607	11 (tie)	3	-8
Germany	0.590	12	11	-1
Finland	0.574	13 (tie)	21	+8
Sweden	0.574	13 (tie)	10	-3
France	0.459	14 (tie)	7	-7
Malta	0.459	14 (tie)	32	+18
Austria	0.443	15	61	+46

Graph 5.1
E-Participation Index 2004, top 20 countries



The quality of 'what is provided' appears to have a relationship with the income level of the country. High income countries invest in improving the relevance and quality of information and services. Table 5.2 shows that 64 percent of the high income and 36 percent of the upper middle income countries provided above average e-participation services. On the other hand, the quality and relevancy of the participatory services provided by 71 percent of the lower-middle income and an overwhelming majority of low income countries were below the average.

The quality of 'what is provided' appears to have a relationship with the income level of the country. High income countries invest in improving the relevance and quality of information and services.

Table 5.2
E-participation by income group

	Number of Countries		*Percentage of Countries*	
Income Class	**Above Mean**	**Below Mean**	**Above Mean**	**Below Mean**
High Income (n = 39)	25	14	64%	36%
Upper Middle Income (n = 36)	13	23	36%	64%
Lower Middle Income (n = 55)	16	39	29%	71%
Low Income (n = 61)	4	57	7%	93%
Total Countries	**58**	**133**	**30%**	**70%**

**Note: Two countries, Nauru and Tuvalu, are not members of, and therefore not included in, the World Bank dataset. In the absence of GNI data GDP is used. Nauru has a GDP per capita of USD 5000 while Tuvalu USD 1100.
Income Source: http://www.worldbank.org/data/countryclass/countryclass.html
Income group: Economies are divided according to 2003 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $765 or less; lower middle income, $766 - $3,035; upper middle income, $3,036 - $9,385; and high income, $9,386 or more.

In terms of measuring 'how well' are individual countries doing, Table 5.3 shows there are only 2 countries – the United States and the United Kingdom – in the world which have e-participation scores falling in the top third when judging the quality and the relevance of the e-participation initiatives. Another 15 (or 8%) were in the mid range while what a large 75 percent of countries put out was of little relevance or had mediocre quality.

Table. 5.3
Quality and relevance of E-participation

	67 – 100 %	*34 – 66 %*	*1 - 33%*	*No score*
No of countries	2	15	133	28
% of countries	1.12	8.4	74.7	15.7
No of countries online 178				

Top 1/3rd = 67 – 100 %
Middle = 34- 66 %
Lowest 1/3 = 1-33 %
No score = Countries scored a zero on e-participation

A caveat and a reminder about this analysis is in order. First, the measurement of willingness, quality and relevancy above rests primarily on website assessments. Second, at this early stage of website development in nations around the world, constructing a survey instrument covering all the possible features of political e-participation is not possible since the results are likely to be zero or very close to zero for the overwhelming majority of countries. Therefore, the instrument and consequently the results are tuned to reality, as it exists. For example, as in last year's Survey, the government attempt to use ICT to engage citizens is assessed more in the consultative rather than in the direct decision-making process. Third, the survey

What a country chooses to provide is a function of both the willingness and ability to do so. As such it is related not only to the level of development, financial resources, it also reflects its political willingness to engage the citizen in public policy decision making and consultation.

instrument assumes existence of e-participation at a rather rudimentary level. And finally the comparative ranking of countries is purely for illustrative purposes.

Table 5.4 gives percentage relevancy of some other counties. As the table shows several countries scored well in providing government information to citizens about the benefits of e-information, such as documents, tools for dissemination of timely information or listings of events for issue-specific topics open to citizen participation. The substantive quality went down in what was provided for e-consultation and informing citizens of ways to provide input, choice of topics for online discussion and real-time online access for citizens to documents produced as part of a decision-making process. This feature also captured citizen usage, and quality of discussion as judged by the content on discussion forums/lists, web casts/meetings, list-servs, etc., between citizens and the government. While the USA and the United Kingdom provide on average 70-75 percent relevant and timely information tools for citizen e-consultation, countries such as Singapore provided 63 percent and the Republic of Korea 50 percent of the tools and material relevant to e-consultation. The proportion ranged from 0-25 percent in the lowest group of countries.

Table 5.4
Quality and Relevance of e-participation, selected countries

	e-information	*e-consultation*	*e-decision making*	*Total*
	%	%	%	%
		67 - 100 percent		
United Kingdom	80	75	63	73
United States	80	70	54	68
		34 - 66 percent		
Canada	85	60	58	65
Singapore	70	63	50	61
Netherlands	85	53	46	58
Mexico	65	60	42	56
New Zealand	65	60	42	56
Republic of Korea	80	50	46	56
Denmark	85	45	42	54
Australia	75	38	46	49
Estonia	75	43	29	46
		1 - 33 percent		
France	70	25	17	33
Malta	60	20	33	33
Philippines	55	18	17	26
Indonesia	30	15	17	19
Argentina	55	5	8	18
Brazil	65	3	4	18
Kyrgyzstan	30	13	8	15
Pakistan	25	0	21	12
Mauritius	15	13	4	11
India	25	0	13	10
Kazakhstan	20	5	8	10
Malaysia	30	0	4	8
China	15	0	8	6
Kenya	5	5	4	5
Mauritania	10	0	0	2

What a country chooses to provide is a function of both the willingness and ability to do so. As such it is related not only to the level of development, financial resources, it also reflects its political willingness to engage the citizen in public policy decision making and consultation.

As noted above, in terms of consideration of citizen input into public policy processes the top scorers were the developed countries. The United Kingdom had 63% of the relevant substantive features online while the United States had around 54%. Though Canada scored less in citizen decision making, it scored 2nd on citizen participation in decision making.

Some developing countries showed surprising results. Malta (33%), Pakistan (21%) and India (13%) all scored higher than other countries in their group on decision making. Interestingly, both Pakistan and India had zero services allowing for *formal* citizen consultation on specific policy issues but a high 21 percent and 13 percent in providing input tools for citizen participation in decision making in general. Graph 5.2 gives a typology of countries by key participatory features. Whereas around one third conduct online polls, as Graph 5.2 indicates less than a quarter of the countries have a policy of encouraging citizen feedback on government public policy. Even less (11%) have a provision for online allowing citizen feedback.

A deeper analysis into the typology of countries providing participation services reveals that a total of 43 countries have an official policy of encouraging citizen participation in public policy making. Their intent is evident from their online statements to the effect. These are listed below in Table 5.5.

Graph 5.2
Countries encouraging online feedback and consultation

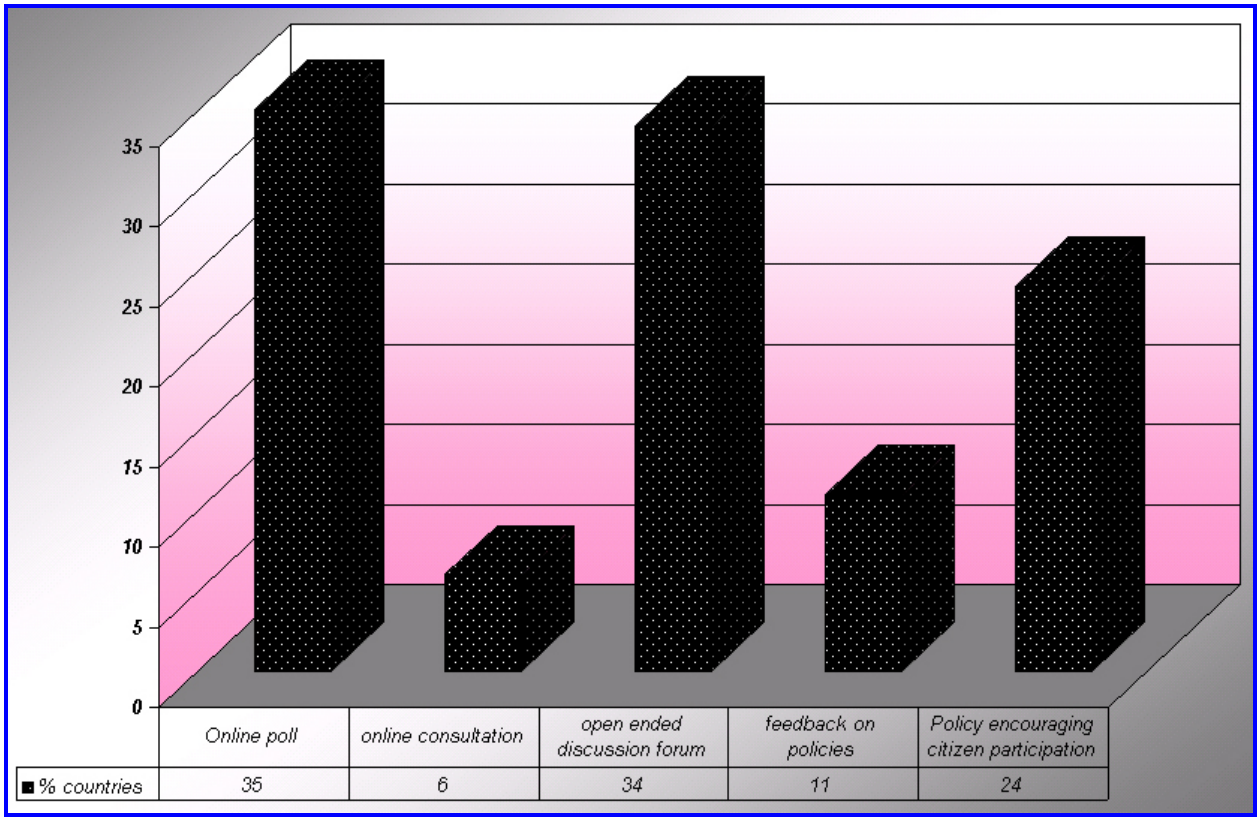


Table 5.5
Countries with a policy of encouraging citizen participation

1	Argentina
2	Australia
3	Austria
4	Belarus
5	Belgium
6	Bulgaria
7	Cambodia
8	Canada
9	Chile
10	Colombia
11	Denmark
12	El Salvador
13	Estonia
14	Finland
15	France
16	Honduras
17	Hungary
18	India
19	Indonesia
20	Israel
21	Kenya
22	Latvia
23	Malta
24	Mauritius
25	Mexico
26	Mongolia
27	Netherlands
28	New Zealand
29	Panama
30	Philippines
31	Republic of Korea
32	Russian Federation
33	Singapore
34	Slovakia
35	Sweden
36	Switzerland
37	Thailand
38	Turkey
39	Ukraine
40	United Kingdom
41	United States of America
42	Uruguay
43	Venezuela
	24 % of total countries

Many countries encourage participation but provide limited relevant and qualitative mechanisms to allow user feedback.

Only 20 – or 11 percent – had an actual provision for user feedback on citizen participation.

Many countries encourage participation but provide limited relevant and qualitative mechanisms to allow user feedback. For example, Israel, Venezuela, Thailand and Turkey, among others, have clear policies maintaining they encourage citizen participation, but they do not provide any online mechanisms to do so. Only 20 – or 11 percent – had an actual provision for user feedback on citizen participation. Eighteen out of these belong to the top 20 countries by e-government readiness and the e-participation indices. Kenya and Mongolia are a surprise inclusion in this list but point to the commitment of the governments (see Table 5.6 below).

Even fewer countries encourage online consultation. Only 6 percent provide the relevant background of proposed legislation, issue briefs or other components of an initiative or other regulatory material as part of the consultation mechanism. A similar percentage provides a specific feedback mechanism for the consultation purpose directly to the government agency in charge and state that government will take submissions regarding the comments into consideration.

Table 5.6
Countries allowing feedback on policies

1	Australia
2	Belgium
3	Canada
4	Chile
5	Denmark
6	Estonia
7	Finland
8	Germany
9	Hungary
10	Kenya
11	Mauritius
12	Mexico
13	Mongolia
14	Netherlands
15	New Zealand
16	Peru
17	Republic of Korea
18	Singapore
19	United Kingdom
20	United States
	11 % of total

Table 5.7 lists countries which provide online consultation. Even within this small group the United States, United Kingdom, and Singapore are far advanced in soliciting citizen views for public policy making inasmuch as consultation facilities exist on their Ministry/sector sites or link to a consultation portal, which is home to all consultations across the government, including the ministries in question. These are truly Best Practices in e-participation.

Among this small group are a few of the developing countries whose performance in this respect is significant. Countries such as Chile, Estonia, and Mauritius, even though still in the initial stages of e-government development, provide online facilities for feedback on policies and mechanisms for consultation with the government on public policy issues.

Table. 5.7
Countries providing online consultation facility

	Country
1	Australia
2	Canada
3	Chile
4	Denmark
5	Estonia
6	Finland
7	Mauritius
8	New Zealand
9	Singapore
10	United Kingdom
11	United States of America

…the distribution of e-participation across countries remains highly skewed with its potential under exploited.

Finally, the distribution of e-participation across countries remains highly skewed with its potential under exploited. For the most part, the majority of countries, especially developing countries, are not yet providing any meaningful qualitative or relevant services to encourage deliberative participatory dialogue on public policy decision making.

PART TWO

ACCESS-FOR-OPPORTUNITY FRAMEWORK

Chapter VI

VI. Access-for-Opportunity

Many policy makers and e-government observers alike have recently focused attention on the issue of the Digital Divide. One of the key arguments supporting the idea that a Digital Divide not only exists, but is growing, maintains that the increased use of ICT for everything from the delivery of public services and information to online shopping benefits only those who have the means to own, or at least "access," new technology. In turn, this widens the already large gap – the Divide – between e-haves and e-have-nots across the globe.

Real access provides opportunities for economic development, especially in the evolving global knowledge based economy.

There is certainly some merit to this argument, and the work of those seeking to bridge the Digital Divide is worthy of support. Others, however, seek to slow down, or, indeed, halt the progress of e-government initiatives and other ICT development on the basis that such development is increasing the Digital Divide. This "devolutionary" argument requires a much more careful analysis. Those who take this stance sometimes ignore the growing body of empirical research and anecdotal evidence suggesting that the issue of access is much less about the technology alone, but includes access to educational, social and cultural resources that directly and indirectly facilitate the effective take-up and utilization of ICT for development, including e-government.

Real access provides opportunities for economic development, especially opportunities in the evolving global knowledge based economy. Nations that ignore or fail to provide sufficient resources for access development – not simply ICT infrastructure, but all the key access elements as described below – are potentially risking a large part of their economic futures.

Technology infrastructure is a necessary, but not a sufficient, condition for real access.

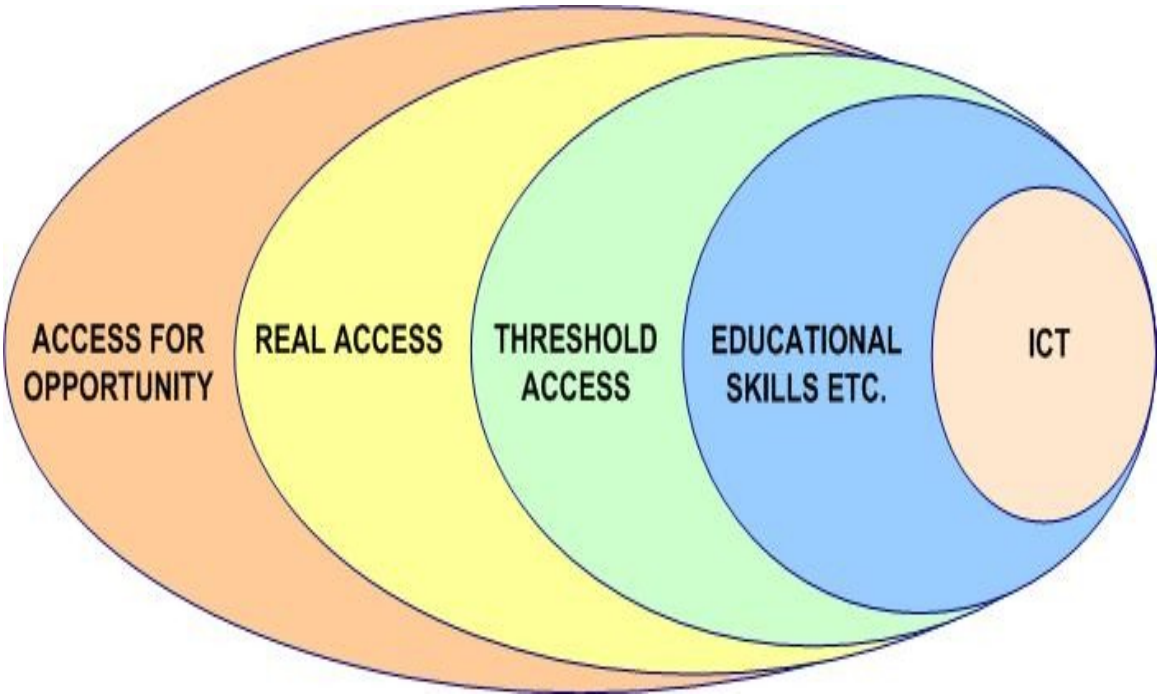
VI.1 The Emerging 'Access-for-Opportunity' Framework

Efforts related to ICT for development traditionally have focused on technology infrastructure issues and the related access to the physical infrastructure. The common thinking is that if developing nations could somehow get to the same infrastructure level as developed nations, their citizens, businesses and governments could finally gain "access" and partake of the economic bounty being created by the global knowledge economy. One of the shortcomings of this approach, however, is that the required investments in technology infrastructure – especially land-based infrastructure associated with creating physical networks – is often prohibitively

expensive for most developing nations, even as the relative costs of such infrastructure continue to decrease over time. Technology infrastructure is a necessary, but not a sufficient, condition for **real access**.

Access must be blended with relevant and culturally appropriate content for onward transmuting into knowledge.

Access-for-Opportunity Framework



The ***Access-for-Opportunity Framework*** lays out the parameters of what is 'real access' and how it translates into opportunity and empowerment.

It maintains that physical access to ICT is only the first step towards building real access which leads to opportunity. Access must be blended with relevant and culturally appropriate content for onward transmuting into knowledge. The blended knowledge is processed and utilized to create opportunity for economic and social empowerment.

All of this needs to be supported by an integrated framework of laws and regulation; institutions and processes; and commitment, encouragement and involvement of government, the private sector and the civil society.

VI. 1.1. *Access for Acceleration Model*

Within this framework the **Model of Access-Acceleration**, outlined below, maintains that the *technology infrastructure needs to reach some threshold level in a given nation for access to start accelerating, but only as long as other access-supporting economic, social, educational, and cultural elements are in place.* Under this approach, the more prepared a nation is, in terms of its educational, cultural and social support structure, the better

off it will be when technology infrastructure finally reaches the threshold access point. Only when a nation reaches the access-acceleration point will it be able to effectively and fully participate in the global knowledge based economy, thereby reaping the greatest economic, social and quality of life rewards for its citizens.

From a policy standpoint, the Access-Acceleration Model supports the idea that efforts to provide real access must be broad based, combining work across the policy spectrum and must include government leaders at the highest levels. If efforts are limited to a technology focus, and only involve technology experts and technology interests, they will fail. This model helps explain real access, and at the same time provides guidance for those seeking to reduce disparities and providing real access on both a national and a global level.

There is a threshold level of "real access" which, when attained, will allow the subject to enter a state of accelerated access.

This chapter presents a model which would be useful to increase real access to ICT. Whereas an important part of the *Access-Opportunity Framework*, the model does not deal in depth with the legal, institutional and regulatory requirements necessary to build the supportive environment for real access and opportunity which merit stand alone inquiry and research.

Access-Acceleration Model Defined

The Access-Acceleration Model rests on a basic premise: There is a threshold level of "real access" which, when attained, will allow the subject to enter a state of accelerated access. The threshold level of access is comprised of threshold levels of each of the following key access elements:

1. ICT Infrastructure
2. Penetration of Technology Tools/Devices
3. Government Leadership Supportive of Technology
4. Education Directly Supportive of Technology
5. Culture of Technology
6. Global Language of Technology

Once a threshold level of access…is attained by a nation, it enters a state of "accelerated access," whereby access for the population leads to greater opportunities and consequently a desire, indeed a need, for more real access.

The threshold levels for each of the access elements are not absolute – rather, they relate to, and impact with, one another so that a high level of one may allow for a lower level of another while still providing an overall threshold level of access. The relative mix can – and does – vary, but the overall elements must combine in such a way as to reach the total threshold level of access. Once this threshold level of access to ICT is attained by a nation, it enters a state of "accelerated access," whereby access for the population leads to greater opportunities and consequently a desire, indeed a need, for more real access. Threshold access, in turn, drives educational, social and cultural changes directly related back to ICT access, which once again drives the desire and need for an even higher level of technology access, which in turn drives new educational, social and cultural changes, and so on. Thus, **real** access continues to accelerate as each of the component elements continue to evolve, becoming ever more refined and supportive of access to ICT.

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ACCESS FRAMEWORK DEFINITIONS

⇒ ***Access threshold*** = A *static cut off point* where the mix of technological, economic and social systems begin to blend together to provide a synergy which allows positive feedback cycles of technology for the utilization of knowledge which allow for greater economic and social opportunity. Beyond the access threshold a country enters the accelerated access phase.

⇒ ***Accelerated Access*** = A *dynamic* changing optimal mix of technology, educational skills, economic and societal conditions which come together at any given point in time to produce threshold access which in turn leads to real access.

⇒ ***Real Access*** = The *equilibrium* level of access whereby an individual has the requisite availability of technology, educational skills, culturally appropriate and relevant content in his/her language of choice at an affordable cost.

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The access-acceleration model can be applied to any discrete unit of society, for instance an individual, a family, a community, a business, an industry sector, a government agency, a specific government sector (e.g., public health, education, economic development) a municipality, and so on. The speed with which any unit "accelerates" access towards the state of *real access* is a function of the speed with which the related technological, educational, cultural and social access elements can evolve in such a way as to support overall technology access and utilization within a supportive regulatory, legal and institutional framework.

While some countries, individuals, businesses and even some industry sectors have reached mature stages of, most of the global population, most units of government and the public sector in general are lagging. At an even broader level, only a handful of nations, all within the developed world, can be considered to have reached this state of access-acceleration. The vast majority has not yet reached real access or even a threshold level of ICT infrastructure needed to enter the acceleration stage, and most are similarly lagging in the other critical access elements – thus, even with major investment in technology infrastructure, these nations would still have major impediments to effective access.

Summary of the Critical Elements of Access

Following are brief descriptions of each of the critical elements of access which, taken together, are the basis for the overall level of access.

1. ICT Infrastructure

ICT infrastructure is by far the most studied and most clearly defined element of access. Simply put, real access requires some final "connection" for a user: logging on to a computer that connects to the internet through a dial-up connection, broadband connection, etc.; or using a mobile device to connect to the internet via wireless connection that depends on a physical network of transponders and routers; or simply having a land line telephone hardwired to a physical system that can be utilized for access. Establishing physical infrastructure tends to require heavy capital investments; these costs are generally recouped through individual service connectivity fees, utility rates, and the like.

2. Penetration of Technology Tools

The basic "tools" associated with new information technology are evolving at a dizzying rate. The television, radio and land-line telephones were long considered the basic tools that end users needed or desired for access. With the emergence of the internet, the personal computer has fast become the new baseline tool for access, and newer devices such as mobile/handheld computers, mobile phones, hybrid mobile devices (all-in-one phones, PDAs, music players, etc.), portable global positioning systems (GPS), and other devices are spreading just as fast. Some core set, if not all, of these tools for access must be widely available throughout a country, must be affordable to the majority of the population, and must have at least first tier support and maintenance locally available in order to reach the required access threshold.

3. Government Leadership Supportive of Technology

Public proclamations of support of e-government and ICT for development are a generally good first step to demonstrate government leadership and support in the area. However, a more concrete indicator of government technology leadership is the formal creation and public disclosure of a national e-government plan or policy, or some similar formal policy documentation. Other clear indicators, which often take longer to develop and put in place, are the establishment of the formal legal and regulatory frameworks required for a country to effectively enter the global electronic market, allowing citizens and business to confidently conduct business online and governments to provide public services and information electronically. These legal and regulatory frameworks often follow the creation of national e-government or similar policies.

Evidence that government and policy leaders are being educated and trained to strategically utilize technology for the betterment of society is another indicator, potentially more important over the longer term, of government leadership in support of technology. Witness the almost overnight emergence of courses in e-government, digital democracy, and other government and technology courses at prominent universities across the United States, Europe, Australia, Japan and to a lesser extent elsewhere. The leading schools of public policy, public administration, public health, law, political science and other public sector domains are rapidly

infusing technology awareness, management and strategy – not to be confused with technical computer training – into more traditional areas of policy study. The next generation of public sector managers and leaders graduating from these schools will no doubt change the way government "works" even more dramatically than current changes.

4. Education Directly Related to Technology

An assumption here is that a generally good public education system must be in place for other, more specialized, education and training to be put in place. Education directly related to technology includes the spectrum from technical computer and technology training, to the integration of computers and technology awareness into traditional subject area curriculum. The latter approach is a far more sophisticated, difficult, yet effective way of educating large groups of the population on how to think about and utilize technology as a part of daily life, thus making technology a part of the cultural fabric of a nation and its people.

5. Incorporation of an Emerging Global Culture of Technology

The incredible growth of the internet along with other communications technologies has resulted in a powerful "cultural" effect: technology itself has a bias reflecting the culture of developed nations and regions, the areas with the richest consumer markets for technology and the areas that drive the design and production of technology, even if its actual manufacture often occurs in less developed areas. Similarly, the vast bounty of information and content provided on the internet, over the broadcast spectrum, and through other communications media is produced – some argue controlled – by interests in developed nations. The challenge and opportunity is for nations to accept and incorporate this culture of technology into their own cultures, while at the same time nurturing a local culture of technology that will facilitate the creation of local content, local information markets, etc. This balancing act is admittedly difficult, but certainly not impossible.

6. Incorporation of Emerging Global Language of Technology

The *lingua franca* of the electronic world currently is English, and individuals who do not have some English language skills are going to be at a relative disadvantage to those who do. In general, individuals who only have English language proficiency will be at a relative disadvantage to those who have English proficiency along with one or more other language proficiencies. Thus, similar to the challenge related to the emerging culture of technology, the challenge and the opportunity for nations is to begin incorporating English language acquisition alongside native language training. Unless users have some knowledge of the English language – regardless of how good machine translators become – they will be shut out from large segments of the information wealth available in the electronic world.

VI.1.2. Taxonomy of Countries According To Access-Acceleration Model

The following sections describe the general access characteristics of countries according to a three tier classification: *Access Accelerators; Access Builders; and Access Seekers.*

It is acknowledged that not all developing countries in Group II: Access Builders and Group III : Access Seekers will have the exact same parameters laid out in the model. There are wide differences between the countries and each one's trajectory to development will depend on whether they have the institutions, reforms and programs in place to take advantage of the ICT revolution. However in the interest of brevity they have been grouped under two major headings: Access Builders and Access Seekers.

A. Access Accelerators

Access Accelerators are those few countries that have attained the threshold level of access – across all key access elements – and as a result are experiencing a variety of economic development opportunities facilitated by accelerated access.

Access Accelerators are those few countries that have attained the threshold level of access – across all key access elements – and as a result are experiencing a variety of economic development opportunities facilitated by accelerated access.

The majority of population (75-90%) has access to physical infrastructure and possesses the necessary educational skills to use ICTs. Costs of physical infrastructure, including variable cost; is affordable; educational skills are geared towards re-tooling skills to enable users to take advantage of new ICTs; English language is spoken and understood; the cultural content of the society promotes knowledge acquisition. The concept of lifelong learning spurred by e-learning is an associated requisite. A supportive legal, regulatory and policy framework is in place.

B. Access Builders

Whereas 50-75 % of the population has potential access to a computer and associated network; only a minority (5-10%) of the population in Access Builders countries has real access. Usage is limited to the top income groups in the country due to high cost of access (both initial investment and variable costs); lack of educational skills, lack of local language or local interest content available; and in some instances barriers imposed by the government.

Whereas 50-75 % of the population has potential access to a computer and associated network; only a minority (5-10%) of the population in Access Builders countries has real access.

Countries in this group are just starting to build the foundation for ICT related economic development. In these countries, physical infrastructure is still the driving force leading to access, although in certain instances individual access elements are more fully developed than others. Similar to the numbers for access to physical infrastructure, only a quarter or less of the population owns or has access to technology tools.

The majority of individuals, businesses, civil society organizations and governments are not yet driving and creating access opportunities – and the resultant economic development opportunities – rather they are more reactive to ICT and the other access elements. In general, the benefits of incorporating ICTs into the mainstream business and leisure activities are known and promoted in these countries, but actual

usage is limited to top income groups due to the impediments to access highlighted below.

While some countries in this category do display exceptional governmental leadership in the form of formal proclamations, e-government plans and the like, most do not have such formal plans and policies. Further, virtually none of the countries in this category have the full range of legal, policy and regulatory frameworks required for successful ICT related economic development, and in a few instances governments have actually erected barriers to or strict controls on access.

With a few exceptions, the populations of most countries in the Access Builders category do not yet have the language/cultural skills required to fully participate in the various electronic "markets." Similarly, users in these countries are just starting to create and make local interest content available electronically. Even so, these local interest efforts are generally not yet of the quality expected by global users of the internet.

C. Access Seekers

The *Access Seekers* category is comprised largely of the lower and low income countries. For many of these countries especially, there is some strength to the argument that putting resources toward closing the Digital Divide should take a backseat to feeding or providing health care for the populace.

The ***Access Seekers*** category is comprised largely of the lower and low income countries. For many of these countries especially, there is some strength to the argument that putting resources toward closing the Digital Divide should take a backseat to feeding or providing health care for the populace. This again begs the argument, however, that if ICT related economic development can leapfrog the development process itself and improve the quality of life in these countries, then some investment should be made in incorporating ICTs into development. The large majority of the population in these countries is not connected physically to a network; in many cases, connectivity in the traditional sense is not even being planned for the foreseeable future, and the key access elements are all at critically low levels. These countries are in danger of being marginalized as the global knowledge based economy continues to develop and expand; nations in the Access Seekers category will potentially be left behind if the public and private sectors do not quickly act to bolster each of the key access elements.

There appears to be little evidence of government leadership support, other than occasional proclamations and some standout national e-government/ICT plans. There is a virtual absence of formal legal, policy and regulatory frameworks to support electronic commerce and other electronic activities.

To be sure, individual demonstration projects have shown some level of success connecting individuals and communities using newer, less costly technologies such as wireless technologies, but widespread implementation of these types of programs would still require large investments from the government or private sector.

Access Seekers have virtually no capabilities to create local interest content of any sort, let alone on a scale and of the quality that could become a valuable part of the developing electronic world. Similarly, lack of language skills and resources prohibits these countries from being able to fully participate in and utilize the information exchange and commerce readily available through electronic media.

Detailed characteristics of the three groups are presented below.

Access-Acceleration Typology

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A. Group I: Access Accelerators

1. Access to Physical Infrastructure:

- Mature physical infrastructure including deep penetration of telecommunications infrastructure.
- Widespread internet access, including high levels of broadband connectivity;
- Access availability to 75-95% of the population.
- Costs for connectivity, including variable costs, are a fraction of monthly per capita income.

2. Penetration of Technology Tools/Devices:

- 75-90% of population own or have easy access to basic technology tools such as computers (desktop and portables), televisions, phones (land lines and mobile devices), personal digital assistants (PDAs), etc.
- Demand for newer and more technologically advanced devices such as hybrid mobile devices (phone, PDA, email/internet, music, etc.), portable global positioning systems (GPS), and others drives continues to drive a vibrant consumer technology market.
- Growing awareness of, and attention to, special access needs of existing underserved and hard-to-serve groups in the population, e.g., disabled, seniors, youth, rural, poor.

3. Government Leadership Supportive of Technology:

- Clear evidence of government commitment and support for ICT for development.
- Government plans to utilize technology to better serve and inform citizens and to move towards a knowledge society.
- Supportive legal, regulatory and policy frameworks (e.g., policies and laws dealing with electronic commerce, electronic public information, digital contracts, cyber crime, and Internet taxation, e-learning) are in place.

4. Education Related to Technology:

- General Education: Universal access to public education; mature public education system running through secondary and often post-secondary institutions; available private education system parallel to public system.
- Skills Education: Educational skills geared towards re-tooling skills to enable users to take advantage of new ICTs; communication skills, including English language training,
- E-Learning: Widespread access to e-learning through formal distance education and online training programs, and through less formal, collaborative e-learning programs facilitated by government, business, civil society organizations, and communities.
- Individuals, educational institutions, businesses and governments create e-learning markets and industries.

5. Incorporation of Emerging Culture of Technology:

- Capabilities to produce and manage significant amounts of electronic content and information locally.
- Producers and consumers of electronic information, goods and services.

6. Incorporation of Emerging Language of Technology:

- General Literacy: Around100% literacy rates.
- English Language Acquisition: English is either the native language or it is widely spoken and understood.

B. <u>Group II: Access Builders</u>

1. Access to Physical Infrastructure:

- Less than twenty-five percent of the population has real access to a network.
- Cost of access—both initial investment and variable costs tend to be very high.
- Pace and level of infrastructure development and implementation is uneven, varying from country to country depending on the nature of the telecommunications environment (e.g., government monopoly, public subsidy, competitive market, etc.), and the potential consumer and business markets available.

2. Penetration of Technology Tools/Devices:

- Only a quarter or less of the population owns or has access to now basic technology tools such as computers and mobile devices.

3. Government Leadership Supportive of Technology:

- Supportive legal, regulatory and policy frameworks (e.g., policies and laws dealing with electronic commerce, electronic public information, digital contracts, cyber crime, Internet taxation, e-learning) are in not yet in place.
- Do not have the full range of legal, policy and regulatory frameworks required for successful ICT related economic development, and in a few instances governments have actually erected barriers to or strict controls on access.

4. Education Related to Technology:

- General Education: Public education system is in place, but lack of resources limits outreach.
- Skills Training: Technical skills training programs are fairly well developed, but often they operate outside of the general educational system. Technical skill training is not integrated into educational system and/or standard curriculum.
- E-Learning: Utilized by and available to only the top businesses and high income individuals. Some evidence of government promotion of e-learning, but in general these programs tend to be scattered and appear not to be well resourced or planned.

5. Incorporation of Emerging Culture of Technology:

- No culture of the language/cultural skills required to fully participate in the various electronic "markets."

- Local content beginning to be available electronically.

6. Incorporation of Emerging Language of Technology:

- General Literacy: Literacy rates vary from country to country, but tend to be significantly lower than those of nations in the Access Accelerators category.
- English Language Acquisition: Some evidence of broadening acquisition of English language skills, especially in the business and government sectors, but still probably not on a scale required to reach the threshold level.

C. Group III: Access Seekers

1. Access to Physical Infrastructure:

- Physical infrastructure is minimal.
- Physical connectivity remains prohibitively expensive, on an individual access basis (personal purchase of a single access point) and on an infrastructure investment basis (government or private sector investment in large-scale infrastructure).
- The private sector has remained largely on the sidelines.

2. Penetration of Technology Tools/Devices:

- The vast majority of the population has no access to new technology tools such as computers and mobile devices.
- Access to more traditional tools such as television, radio and land-line phones is somewhat higher, but still critically low.
- Large segments of the population lack even a familiarity with new technology tools.
- The business sector access to technology and use of technology tools is not yet considered a necessity.

3. Government Leadership Supportive of Technology:

- Little evidence of government support for national e-government/ICT plans.
- Virtual absence of legal, policy and regulatory framework to support electronic commerce and other activities.
- Governments have erected barriers to access.

4. Education Related to Technology:

- General Education: Inadequate public education system, in terms of facilities, learning resources and human resources—teachers, administrators, etc.
- Skills Training: Only available in specialized situations, or when related to specific economic development projects, e.g., technology training centers for developing nations. Not at all integrated into cultural/social fabric.
- E-Learning: Virtually non-existent except for wealthiest and most educated segments of population, or limited to e-learning demonstration programs in select areas.

5. Incorporation of Emerging Culture of Technology:

- No capabilities to create local interest content.

- Lack of language skills prohibits participation and utilization of information exchange and commerce through electronic media.

6. Incorporation of Emerging Language of Technology:

- General Literacy: Literacy rates are among the lowest around the globe.
- English Language Acquisition: Other than among the highest income classes in these nations, the general population has no resources available to acquire English language skills, and the government and society at large has little ability to do more than encourage language acquisition.

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The *Access-Acceleration Model* illustrates an important point: rapid progress in ICT for development can lead to greater access and opportunity for nations and peoples.

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In the globalized world, the distance between governments, businesses and the citizen with real access (the e-haves) has reduced irrespective of their geographical location. At the same time the communication and distance between the government and those, with no-access no-skills and no-prospects (e-have-nots) is increasing. Countries where the majority of population has, or has the potential of achieving, real access are already at the stage of utilizing knowledge for increasing opportunity i.e. the opportunity for economic gain; the opportunity for social empowerment; and the opportunity for societal improvement.

Those where the majority lacks a real access, and do not possess skills to translate information/knowledge affordable through ICT, are below the threshold level of transmuting information into new knowledge and using that knowledge for opportunity. These countries form a ring around the world and these groups, across the globe, are the ones who are likely to be truly marginalized in the information society. As countries progress in expanding and consolidating their infrastructure and human capital base the key issue is at what speed will the populations of Group II and III enfold into the environment of Group I. Or will they?

The Access-Acceleration Model can be used not only to analyze ICT initiatives within a sector, community or country, but also to compare and categorize different knowledge societies. Based on their key access parameters like connectivity, content, capacity and culture, the countries of the world can be grouped into the three Model categories for analysis.

VI.2 Existing Worldwide Disparity in achieving Access

Access disparity can be divided into:

- *Global access-divide* which exists between higher income developed regions of the world and the lower income developing regions of the world.
- *National access-divide* which exists between higher income developed countries and lower income countries
- *Local access-divide* which exists within countries

These divides are not only on the basis of a disparity in access to infrastructure and telecommunications as is commonly assumed in the arguments on digital divide. They can encompass one or many of the following:

- inadequate access to digital tools,
- poor supply of electricity,
- high cost of online access relative to local purchasing power,
- lack of awareness about or skills related to ICTs,
- lack of local relevance of online services,
- lack of local language content and tools,
- concerns over security and reliability of ICT infrastructure,
- lack of supporting legal protection for online transactions,
- poor participation in global standards councils,
- undue control over local media and institute measures to filter internet content,
- un-sustainability of many ICT pilot projects,
- unequal playing field for telecommunication and data communication operators.[40]

Access-opportunity divide then comprises, among other: income divide telecommunication access-divide, education and skill access-divide, language access-divide; content access-divide and affordability divide.

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In a special focus on 'Access-for-Opportunity' this chapter explores in depth the various aspects of the lack of ***real access*** for development. With the model as the backdrop the following sections offer insights into clear patterns of the access-opportunity divide. In doing so it relies on the UN Global E-government Survey 2004 database supplemented by data from other relevant sources. It presents a snapshot picture in time of Member States' infrastructure availability, ICT penetration; and the level of education and skill development. By presenting a comprehensive set of issues which make up the access-divide, it seeks a better understanding of the challenges to nation states stemming from the challenges which make up the access-divide.

1. Access divide and income

There is a functional relationship between the development level of a country and the extent, and type of, ICT and e-government services it provides. As income per capita decreases so does the maturity and sophistication of the services offered on the web. Table 6.1 shows the high income countries, with Gross National Income (GNI) per capita more than US$ 9386 provide 54 percent of the overall services across all stages. The 55 lower middle income countries with GNI ranging from $766-3035 provide, on average, around half of the services of high income countries. But the low income countries are extremely far behind in development of their e-government information and services network. Collectively they provide a little more than 10 percent of the potential services using the ICTs.

[40] Dr. Madanmohan Rao. 'The nature of the information society:
A developing world perspective' http://www.itu.int/osg/spu/visions/developing/paper1.html
P 11.

The e-readiness of the lower middle and low income countries is also much weaker in terms of mature stages; in particular both provide hardly any transactional services. Moreover whereas the networked services are limited to a few developed countries, lower middle income and low income countries are way behind them providing only 8 percent and 3 percent of these respectively. For example, the per capita GDP of South & Central Asia and Africa, which is home to most low income countries and to more than one third of humankind, is under 2 percent of North America.[41] In South & Eastern Asia, where close to another one third of the world population lives, the purchasing power is 3.2 percent of the of North America. The percentage of people living in poverty on $1 a day in these regions ranges from 10-46 percent. [42] Income disparities are stark in these and other regions of the world. Consequently, investment in ICTs is low to begin with rendering many of these countries in the Access Seekers category.

Table 6.1
E-government development by Income Classification
Percent of the maximum services

Income Group	*I*	*II*	*III*	*IV*	*V*	*Total*
High Income (n = 39)	86	74	60	27	27	54
Upper Middle Income (n = 36)	68	46	38	7	12	32
Lower Middle Income (n = 55)	65	39	30	2	8	25
Low Income (n = 61)	50	16	14	1	3	11

* The table includes all 191 Member States including those with no web presence in order to have a more accurate income group comparison; n= no. of countries in the class.
**Note: Two countries, Nauru and Tuvalu, are not members of, and therefore not included in, the World Bank dataset and so are excluded from this analysis.
Income Source: http://www.worldbank.org/data/countryclass/countryclass.html
Income group: Economies are divided according to 2003 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $765 or less; lower middle income, $766 - $3,035; upper middle income, $3,036 - $9,385; and high income, $9,386 or more.

Low income, and poverty are interlinked with a lack of access to modern technology in many developing countries.

The inter-linkages between low income, poverty and lack of access to modern technology are apparent when one compares the extent of technology penetration in low income households across income groups in many developing countries. For example, in Panama the wealthiest 10 percent of the population has around 74 percent of the telephones compared to around 2 percent for the bottom quintile. According to one research study on the functional relationship between income per capita and PC use in 161 countries over the 1999-2001 period, each $1000 increase in per capita income leads more than a one percentage point increase in the number of PCs per capita. [43] However the study attributes the global digital divide between rich and poor countries equally to income and lack of telecommunications. It finds that while 53.4 percent of the gap between the United States and Sub-Saharan Africa PC use can be explained by income difference between the two a high 40.7 percent of the gap was attributed to disparity in telecommunications infrastructure. [44]

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[41] GDP/capita and population figures from UN DESA. Statistics Division see ****
[42] More specifically, 10% in South East Asia; 30% in South Asia and 46% in Sub Saharan Africa. See UNDESA. http://unstats.un.org/unsd/mi/mi_worldregn.asp

[43] Menzie D. Chinn and Robert W. Fairlie. 'The Determinants of the Global Digital Divide: A Cross-Country Analysis of Computer and Internet Penetration'. P 10.http://papers.ssrn.com/sol3/papers.cfm?abstract_id=510182
[44] Ibid. p 22.

Table 6.2
Teledensity by Income, selected countries

Country	Poorest quintile	Wealthiest quintile	% of urban HH with telephones	% of rural HH with telephones
Nepal	0	11.0	10.4	0.11
Panama	1.7	73.8	57.4	9.27
South Africa	0.6	75.0	45.7	4.71

Source: The Networking Revolution: Opportunities and Challenges for Developing Countries. InfoDev Working Paper Series. The World Bank Group. June 2000. p18.

The state of e-government readiness in a country is a function of the combined level of its economic, technological and human resource development. Weak access to ICT-for-Opportunity and its counterpart the digital divide between e-haves and e have-notes remains a serious issue in many of these countries. Inequities in telecommunication and human capital development within these populations pose serious constraints on the use of e-government for knowledge and empowerment of the people.

The e-government programs across countries reflect low income and investment in ICTs. Income disparity is reflected in the disparity in their e-government programs as well. Table 6.3 shows these disparities as they are reflected in the web scores of the region. [45] The important point to note is the extent of the difference in scores between the developed high income countries in North America and Europe and those in Africa and South Asia. Africa is the lowest scoring region. With an average score of 31.9, fifty three countries of Africa have, collectively, a mere 13 percent of the average access of 2 countries in North America. To isolate the effects of aggregation, the scores are bifurcated by sub-regions in Africa as well. All sub-regions of Africa have low scores. 'Middle Africa' (comprising Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and Sao Tome and Principe) has the lowest score of 18.1 or only about 7 percent of the highest scoring sub-region of North America. The highest sub-region in Africa (home to Botswana, Lesotho, Namibia, South Africa, Swaziland) is only 1.5 times more than the Caribbean – the lowest scoring sub-region in the Americas and only slightly higher than South and Central Asia, the lowest scoring sub-region in Asia. The region of South and Central Asia itself (comprising Bangladesh, Bhutan, India, the Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan and Uzbekistan) is only slightly better. At an average score of 61.4 its 1.5 billion peoples enjoy only about two thirds of e-services available to the weakest e-ready countries of Europe.

[45] Sub regional classification is taken from the United Nations Statistics Division official classification of regions as of March 8, 2004. Accessed June 22, 2004. See UN Statistics Division. http://unstats.un.org/unsd/methods/m49/m49regin.htm

Table 6.3
Disparity in government websites among regions of the world

Sub-region	No. of countries	Total score	Avg score	Notes	Countries *
Eastern Africa	17	534	31.4		Burundi, Comoros Djibouti ; Eritrea Ethiopia; Kenya Madagascar; Malawi; Mauritius Mozambique Rwanda Seychelles Somalia Uganda United Republic of Tanzania Zambia Zimbabwe
Middle Africa	9	163	18.1	Lowest scoring sub-region	Angola Cameroon Central African Republic Chad Congo Democratic Republic of the Congo Equatorial Guinea Gabon Sao Tome and Principe
Northern Africa	6	226	37.7		Algeria Egypt Libyan Arab Jamahiriya Morocco Sudan Tunisia
Southern Africa	5	359.5	71.9		Botswana Lesotho Namibia South Africa Swaziland
Western Africa	16	407.5	25.5		Benin Burkina Faso Cape Verde Côte d'Ivoire Gambia Ghana Guinea Guinea-Bissau Liberia Mali Mauritania Niger Nigeria Senegal Sierra Leone Togo
Africa	53	1690	31.9	Lowest scoring region	
Caribbean	13	598	46.0		Antigua and Barbuda Bahamas Barbados Cuba

Sub-region	No. of countries	Total score	Avg score	Notes	Countries *
					Dominica Dominican Republic Grenada Haiti Jamaica Saint Kitts and Nevis Saint Lucia Saint Vincent and the Grenadines Trinidad and Tobago
Central America	8	757.5	94.7		Belize Costa Rica El Salvador Guatemala Honduras Mexico Nicaragua Panama
Northern America	2	485	242.5	Highest scoring sub-region	Canada United States of America
South America	12	1350.5	112.5		Argentina Bolivia Brazil Chile Colombia Ecuador Guyana Paraguay Peru Suriname Uruguay Venezuela
Americas	35	3191	91.2		
Eastern Asia	5	561	112.2		China Democratic People's Republic of Korea Japan Mongolia Republic of Korea
South-central Asia	14	860	61.4		Afghanistan Bangladesh Bhutan India Iran (Islamic Republic of) Kazakhstan Kyrgyzstan Maldives Nepal Pakistan Sri Lanka Tajikistan Turkmenistan Uzbekistan
South-eastern Asia	11	1013	92.1		Brunei Darussalam Cambodia Indonesia Lao People's Democratic Republic Malaysia

Sub-region	No. of countries	Total score	Avg score	Notes	Countries *
					Myanmar Philippines Singapore Thailand Timor-Leste Viet Nam
Western Asia	17	1079	63.5		Armenia Azerbaijan Bahrain Cyprus Georgia Iraq Israel Jordan Kuwait Lebanon Oman Qatar Saudi Arabia Syrian Arab Republic Turkey United Arab Emirates Yemen
Asia	47	3513	74.7		
Eastern Europe	10	1213	121.3		Belarus Bulgaria Czech Republic Hungary Poland Republic of Moldova Romania Russian Federation Slovakia Ukraine
Northern Europe	10	1792	179.2		Denmark Estonia Finland Iceland Ireland Latvia Lithuania Norway Sweden United Kingdom of Great Britain and Northern Ireland
Southern Europe	13	1194	91.8		Albania Andorra Bosnia and Herzegovina Croatia Greece Italy Malta Portugal San Marino Serbia and Montenegro Slovenia Spain The former Yugoslav Republic of Macedonia

Sub-region	No. of countries	Total score	Avg score	Notes	Countries *
Western Europe	9	1288	143.1		Austria Belgium France Germany Liechtenstein Luxembourg Monaco Netherlands Switzerland
Europe	42	5487	130.6	Highest scoring region	
Oceania	14	728	52.0		Australia Fiji Kiribati Marshall Islands Micronesia (Federated States of) Nauru New Zealand Palau Papua New Guinea Samoa Solomon Islands Tonga Tuvalu Vanuatu
Oceania	14	728	52.0		

* Note: Sub regional classification is taken from the United Nations Statistics Division official classification of regions as of March 8, 2004. Accessed June 22, 2004. See UN Statistics Division. http://unstats.un.org/unsd/methods/m49/m49regin.htm

2. Disparity in Access to ICT Infrastructure

Access to physical infrastructure by all is imperative for ICTs to yield the full potential. However access to basic infrastructure remains, at best, limited to cities and large towns in most low income developing countries impeding access.

Table 6.4
Correlation analysis

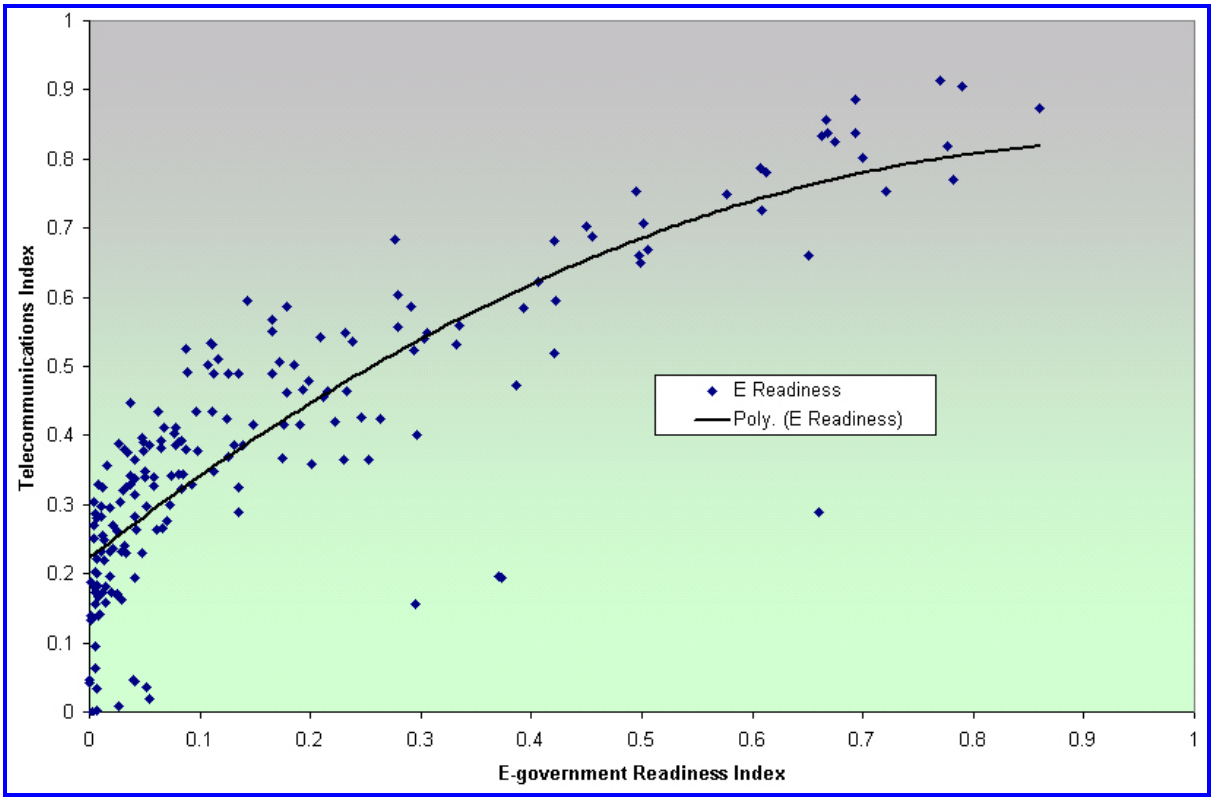
Key Access indicator	Correlation Coefficient
Telecom Index	0.750
Human Cap Index	0.547
PC Index	0.685
Internet users Index	0.702
Tel lines Index	0.629
Online pop	0.746
Mobile subs	0.706
TV sets	0.636

A correlation coefficient measures the relationship between two data sets independent of the unit of measurement. A positive correlation exists when movements in one variable are associated with movements, in the same direction, of the other. Table 6.4 gives correlation coefficients of the e-government websites

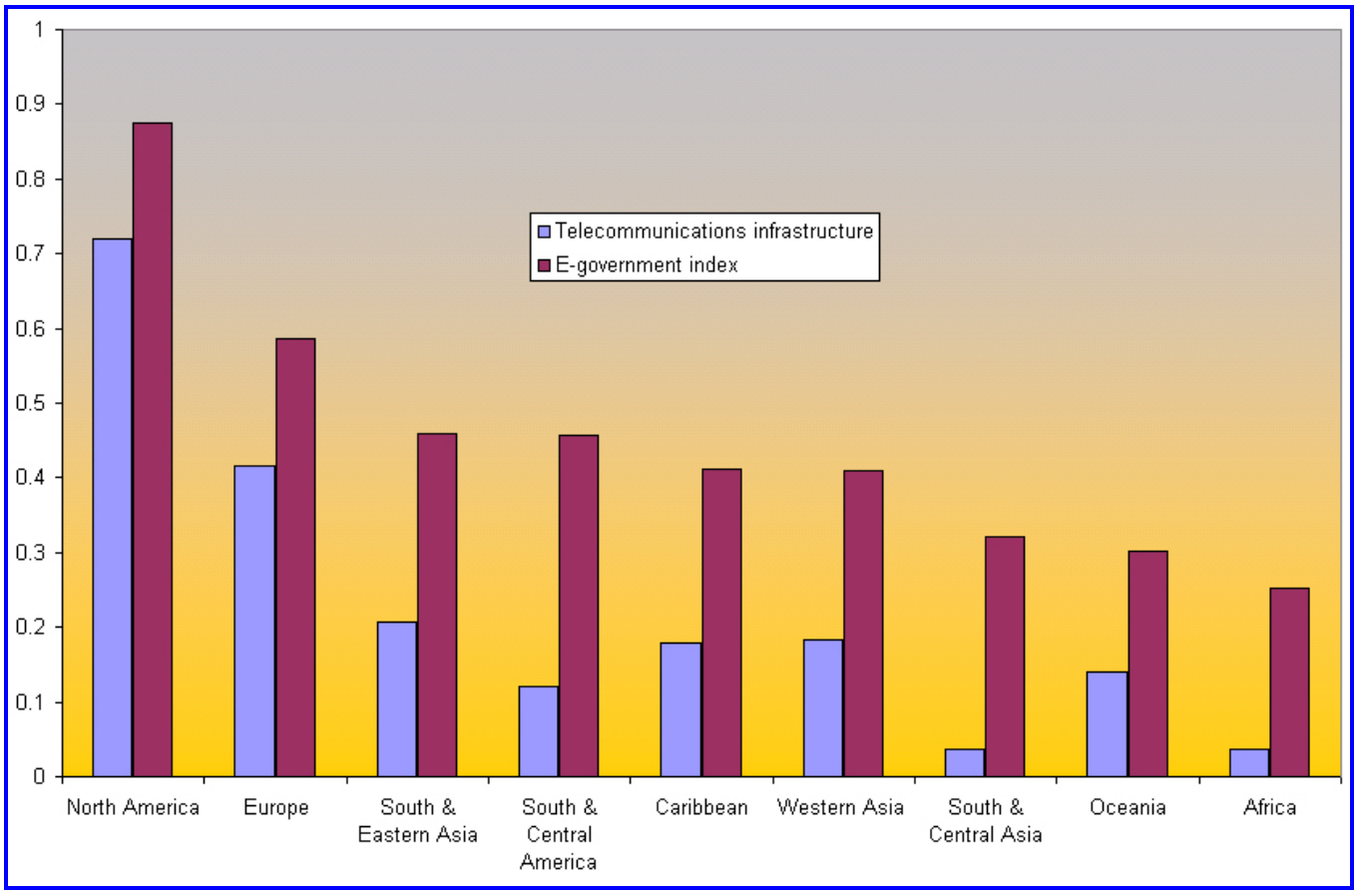
across the world with key access indicators. As can be seen from the table the correlation coefficients for online population, internet users, and mobile are high indicating that generally a country's website development is positively linked to the level of these key access indicators. The correlation with the human development appears weaker than the telecommunications indicators perhaps because it is not the total educational level but the technology related skills which are of greater importance in the educational content.

Telecommunication infrastructure is the platform on which ICT development is built. High income countries which have already put in place extensive communication infrastructure have found it easier to take advantage of the new technologies. On the other hand, countries where telecommunications reforms, including privatization of telecommunication industry, are still in its infancy remain far behind. Graph 6.1 shows strong linkages between greater telecommunication access and higher states of e-government readiness. The disparities across various regions of the world are indicative of the **global access-divide.**

Graph 6.1
Interlinkages between Telecommuncations and E-government



Graph 6.2
Global Access Divide 2004



Africa and South Asia are the two regions which have the lowest access to infrastructure and the weakest e-government program outreach and extent. Both Africa and South & Central Asia regions had an average telecommunication access of 5 percent compared to North America and 9 percent compared to Europe. And this was in comparison to current levels in North America and Europe, which are not yet at 100 % ICT access for all. South & Central America (17%); Oceania (19%); Caribbean (25%) were somewhat better but not much.

Africa and South Asia are the two regions which have the lowest access to infrastructure and the weakest e-government program outreach and extent.

Table 6.5
Regional access indicators, selected countries
Persons per technology

Country	PCs	Internet users	Tel lines	Online population	Mobile subscribers	TV sets
Africa						
Mauritius	8.6	10.1	3.7	769.2	3.5	3.3
South Africa	13.8	14.7	9.4	14.2	3.3	6.6
Seychelles	6.2	6.9	3.7	8.9	1.8	4.7
Ethiopia	666.7	1347.7	188.7	5000.0	1428.6	166.7
Mali	714.3	425.2	188.7	384.6	200.0	58.8
Niger	1666.7	783.1	526.3	909.1	714.3	27.0
South and Eastern Asia						
Republic of Korea	1.8	1.8	2.0	1.9	1.5	2.8
Singapore	1.6	2.0	2.2	1.9	1.3	3.3
Japan	2.6	2.2	1.8	2.3	1.6	1.4
Cambodia	500.0	459.6	384.6	1250.0	36.2	125.0
Lao P.D.R.	303.0	368.9	89.3	588.2	100.0	19.2
China	36.2	21.7	6.0	27.9	6.2	3.2
South-central Asia						
Kyrgyzstan	78.7	33.5	12.9	90.9	96.2	20.4
Kazakhstan	0.0	63.9	7.7	166.7	15.6	4.1
Maldives	14.0	18.7	9.8	50.3	6.7	26.3
Bangladesh	294.1	652.7	196.1	909.1	123.5	58.8
Pakistan	238.1	97.3	40.0	117.6	117.6	6.8
India	138.9	62.8	25.1	149.3	82.0	12.0
Bhutan	69.0	69.1	35.2	5000.0	0.0	166.7
Western Asia						
Israel	4.1	3.3	2.1	5.8	1.0	3.0
Oman	26.7	14.1	11.9	22.6	5.8	1.8
Syria	51.5	77.5	8.1	285.7	42.6	14.9
Yemen	135.1	194.9	36.0	1111.1	47.4	3.5
Bahrain	6.2	4.0	3.8	4.7	1.7	2.2
Cyprus	3.7	3.4	1.5	5.1	1.7	6.5
Europe						
Denmark	1.7	2.0	1.5	1.6	1.2	1.2
United Kingdom	2.5	2.4	1.7	1.7	1.2	1.1
Sweden	1.6	1.7	1.4	1.5	1.1	1.0
TFYR Macedonia	0.0	20.6	3.7	20.4	5.6	3.7
Rep. of Moldova	57.1	29.3	6.2	294.1	13.0	3.4
Albania	85.5	256.7	14.0	294.1	3.6	8.1
Caribbean						
Jamaica	18.6	4.4	5.9	26.8	1.9	5.2
Trinidad & Tobago	12.6	9.4	4.0	9.7	3.6	2.9
Bahamas	0.0	5.2	2.5	17.8	2.6	4.1
Grenada	7.6	7.1	3.2	17.2	14.0	2.7
Cuba	31.4	93.6	19.6	93.5	625.0	4.0
South and Central America						
Chile	8.4	4.2	4.3	5.0	2.3	3.5
Mexico	12.2	10.2	6.8	29.6	3.9	3.5
Argentina	12.2	8.9	4.6	9.6	5.6	3.1
Guatemala	69.4	30.0	14.2	66.7	7.6	16.4
Honduras	73.5	39.7	20.8	156.3	20.5	10.4
Nicaragua	35.8	59.7	31.3	238.1	26.5	14.5
Northern America						
United States	1.5	1.8	1.5	1.7	2.0	1.2
Canada	2.1	1.9	1.6	1.9	2.7	1.4
Oceania						
Australia	1.8	2.1	1.9	1.8	1.6	1.4
New Zealand	2.4	2.1	2.2	1.9	1.6	1.8
Papua New Guinea	17.0	72.9	85.5	36.5	370.4	52.6

Source: From the UN Global E-government Survey 2004 Infrastructure database based on ITU Telecommunications data.

Infrastructure access-divide goes beyond differences in infrastructure access between regions. A review of key infrastructure indices in a region reveals the extent of **national access-divide** within countries, especially in the regions of Africa, South Central Asia and to a lesser extent South Eastern and Western Asia.

⇒ In Africa in 2002 the number of dialup internet subscribers was close to 1.7 million: of the total subscribers, North Africa and South Africa are responsible for about 1.2 million, leaving about 500,000 for the remaining 49 Sub-Saharan African countries. [46]

⇒ In Africa, Mali, Ethiopia and Niger there is one phone line for every 200-500 persons.

⇒ In South Asia, one in a thousand persons was online in Bangladesh compared to 10 times more in Kyrgyzstan.

⇒ In South Eastern Asia, in the Republic of Korea every 2nd person was an internet user and had a telephone in stark contrast to Cambodia where more than 300 persons shared a telephone line while only 1 in 1250 was online.

⇒ The distribution of PCs in the population in the Republic of Korea, Singapore and Sweden is 84-98 percent of that in the United State but in the United Kingdom is 61 percent.

⇒ Within Europe, the availability of telephone lines in Denmark is only slightly higher than in the United Kingdom but is around 9 times greater than Albania.

⇒ In Western Asia, every 6th person is online in Israel compared to one in 286 in neighboring Syria and five times more in Yemen in the region.

These differences indicate the unequal access of ICT which is the primary cause of access-divide. This translates into a lack of opportunity for development. Part of the problem is that in most developing countries the telecommunications infrastructure is concentrated in the capital cities whereas the majority of the population lives outside them. For example, in over 15 countries in Africa, including Cote d'Ivoire, Ghana and Uganda, over 70 percent of the lines are still located in the largest city. [47] As in other access indicators, the developed economies are far in advance of the developing countries in terms of their availability of internet availability, the online population and other indicators.

The impact of a lack of pervasive national telecommunications infrastructure is directly translated into a lack of online access in both the basic services through the e-government programs and the vast body on information and knowledge available on the World Wide Web. In terms of global access these disparities are vast. First only around 12 percent of the world population is currently online. Even though with growth rates in excess of 100 percent in many developing regions of the world, such as South and Eastern Asia, issues of poverty and income result in, at best, a very few people with online access.

[46] The African Internet - A Status Report. http://demiurge.wn.apc.org/africa/afstat.htm
[47] The African Internet - A Status Report. http://www3.sn.apc.org/africa/afstat.htm

Further evidence of this **telecommunication access-divide** is available from the following: whereas the world internet user population rose from 530 million in 2001 to 795 million in 2004 and even though much of the recent growth took place in Asia, Latin America and parts of Europe, around 30 percent of the global online population is in two developed countries – the United States & Canada alone. The 5.1 percent of the population of North America has around 69 percent of the internet share and forms more than 28 percent of all users of the internet (see Graph). Worst off is Africa. Of the 893 million inhabitants of Africa a mere 1.5 percent have access to the internet. Countries which make up the region popularly known as the Middle East are not much better.

Table 6.6
Access Indicator by Region

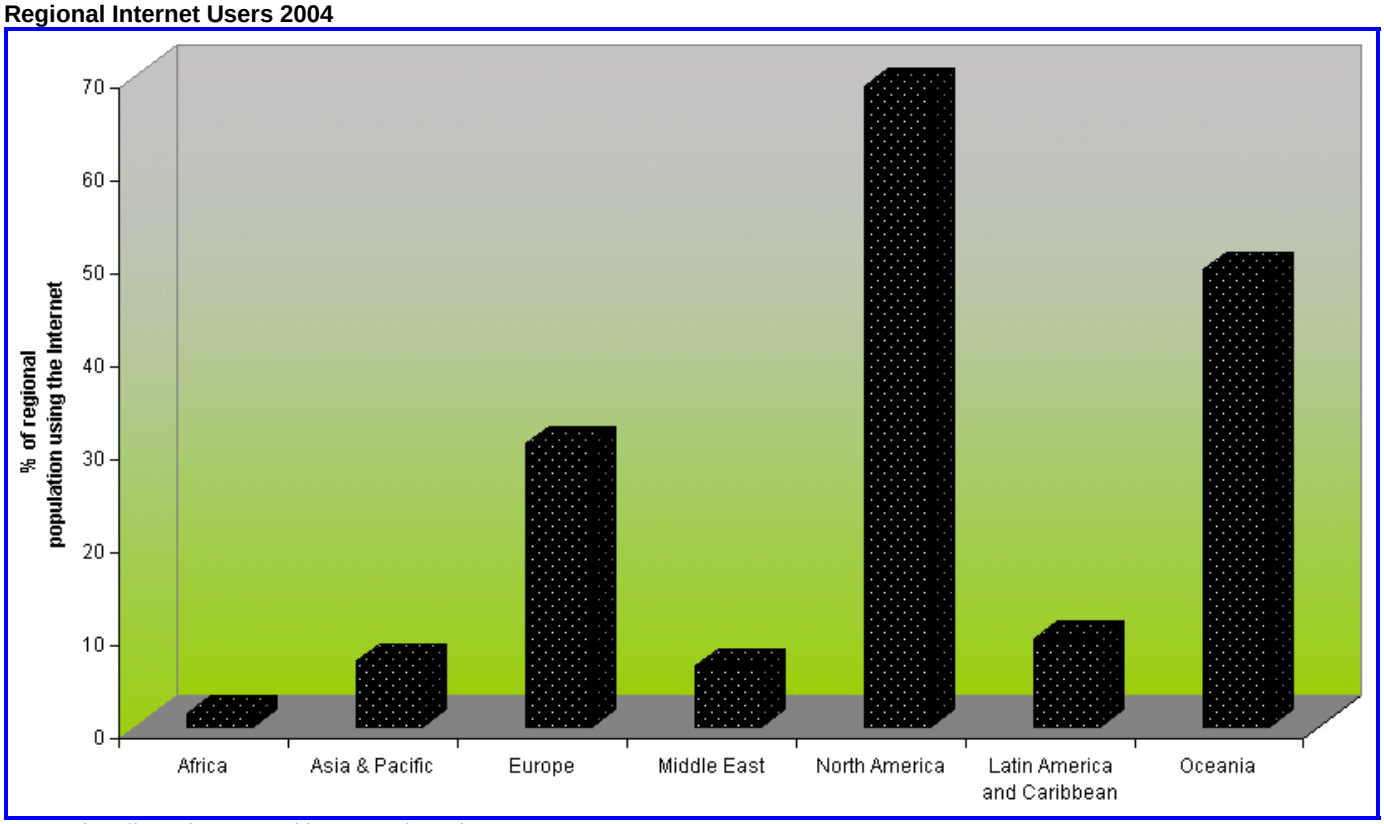
Region	*Population Million a)*	*Internet usage Million b)*	*% of regional population using internet*	*% of world population using internet*
Africa	893.2	12.2	1.4	1.5
Asia & Pacific	3607.5	252.6	7.0	31.8
Europe	730.9	222.2	30.4	28.0
Middle East	258.9	16.8	6.5	2.1
North America	325.2	223.8	68.8	28.2
Latin America and Caribbean	541.8	51.2	9.4	6.4
Oceania	32.5	15.9	49.1	2.0
World Total	6390.2	794.8	12.4	100.0

a)= 2004 Estimates
b)= latest available data
Source: InternetWorldStats.com. http://www.internetworldstats.com/stats8.htm

Barriers to access are not limited to lack of infrastructure. Even groups and populations who have physical connectivity and the educational skills may nevertheless encounter other forms of barriers. The typology of real access is also a function of existing disparities in access by gender, demographics, rural-urban and of marginal groups on the fringes of mainstream society. For example, because educational levels are lower for women in developing countries then men they their access opportunities are likely to be lower. This is particularly true of access to internet. In 2000-2001 the proportion of female internet users among the 39 countries for which data was available ranged from 51 percent in the US to 35 percent in Indonesia. [48]

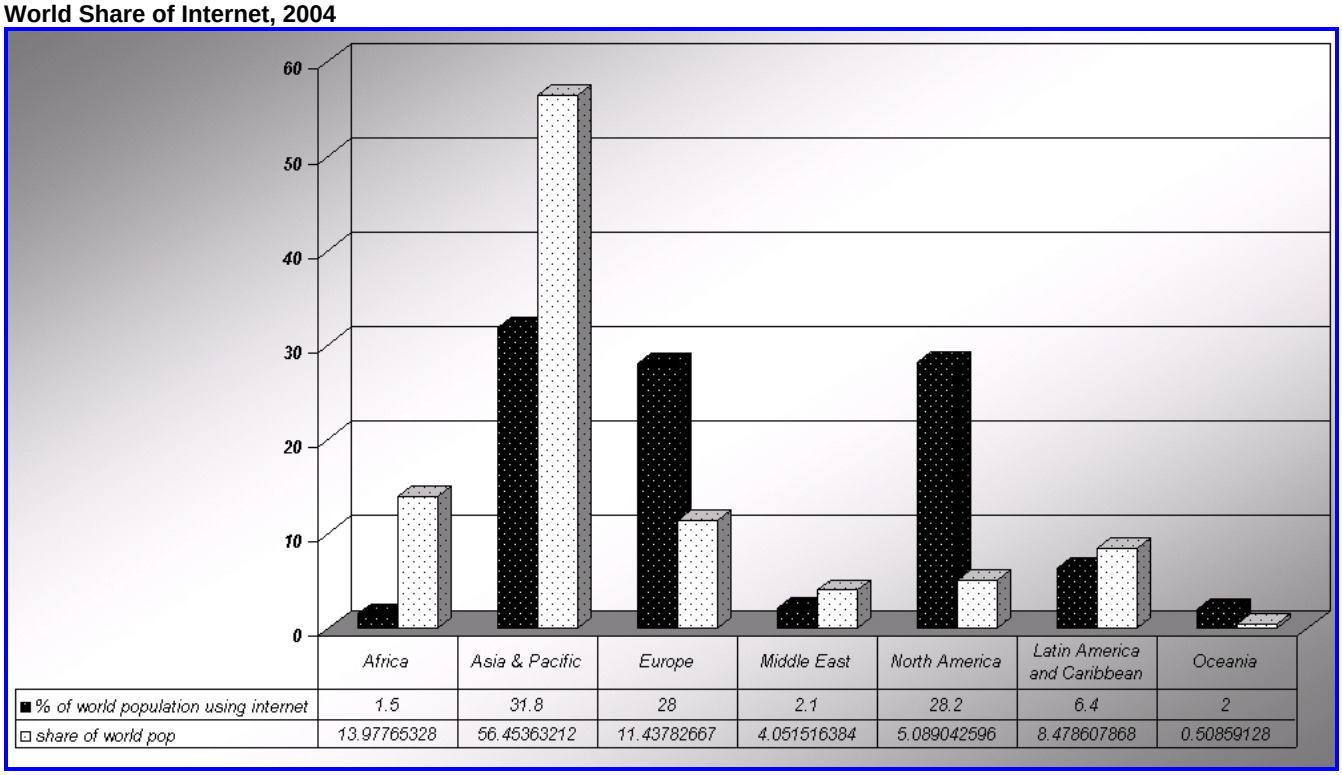
[48] http://www.itu.int/ITU-D/ict/statistics/at_glance/f_inet.html

Graph 6.3
Regional Internet Users 2004



Source: http://www.internetworldstats.com/stats.htm

Graph 6.4
World Share of Internet, 2004



	Africa	Asia & Pacific	Europe	Middle East	North America	Latin America and Caribbean	Oceania
■ % of world population using internet	1.5	31.8	28	2.1	28.2	6.4	2
□ share of world pop	13.97765328	56.45363212	11.43782667	4.051516384	5.089042596	8.478607868	0.50859128

Finally, access to reliable and cost-effective technology systems and platforms at the national government level, let alone at the local level, is also an issue related to ICT infrastructure access. As the Note on Open Source Software in the Box below illustrates, for example, choices of technology platforms by central governments can impact not only how national e-government systems are implemented, but indirectly impact technology access and related choices of individuals, governments and other organizations in society. The imperative is that governments must remain ahead of the "technology curve" as they make technology choices that may have far-reaching and potentially unintended consequences for society.

The UN Global Survey 2004 assessed what type of operating systems countries are using for their e-government websites across the world. (See below).

Box 12
A Note on Open Source Software and National E-Government Websites

The emergence of "open source" web technology has resulted in new choices for the operating systems and web servers that are the technology foundation of all websites and online systems. In the e-government arena, especially at the national level, it has also created somewhat of a controversy: nations find themselves choosing between "open source" technology, most often associated with the Linux operating system and Apache web servers; and the traditional Microsoft platforms (Windows based operating systems and IIS web servers) and the offerings from IBM and Sun (e.g., Solaris, Unix, others).

Open source has been heralded as more cost-effective--open source offerings are generally available free of charge, at least initially--and potentially more secure than the traditional competitors, although there is enough conflicting research and anecdotal evidence that the jury is still out on both of those claims. In the case of Microsoft based technologies, the choice of technology platforms often appears to be more about politics and philosophy than actual technical pros and cons, with decision makers falling into distinct camps. These national level decisions have huge implications in terms of how e-government services are rolled out, impact on the specific technology providers and the technology market overall, and on the resources required for governments to maintain and support their e-government systems.

In any case, the technology platform decision for national governments and agencies will become increasingly important as more public services, information and communications are moved online in the future, and the open source issue will continue to play a major role in how technology platforms evolve.

The summary table below shows that in 2004, open source technologies were installed in support of national government websites more often than any other specific type of system. Open source operating systems (Linux, Free BSD, others) commanded 47% of the national government operating system market. Windows based platforms were not far behind at 36%, with Solaris finishing a distant third at 13%. Others, including Unix and Mac operating systems, were used in only 4% of the installations. For web servers, the free Apache web server was installed in 51% of the national government web systems, with Microsoft IIS farther behind with 33% of the installations. Netscape, Lotus Domino, and other web servers combined were used in 16% of the national government web installations.

Box 12 (cont.)

2004 UN Global E-Government Survey
National Web Server Hosting Technology

Operating System	# of Countries	% of Total
Linux/FreeBSD/Open Source	84	47%
Windows (98/NT/2000/2003)	64	36%
Solaris	23	13%
Other/Unix/Mac/Not Available	7	4%
Total Countries	**178**	**100%**

Web Server	# of Countries	% of Total
Apache	91	51%
Microsoft IIS	58	33%
Netscape	8	4%
Lotus-Domino	4	2%
Other/Not Available	17	10%
Total Countries	**178**	**100%**

Note: Web server technology assessment was conducted on August 3, 2004. 13 Countries do not have websites.

3. Inequality in education and knowledge

In a knowledge society, human capital plays a decisive role, and the capacity to learn matters more than the level of knowledge. [49] Among the characteristics of knowledge society are that lifelong training is essential; explicit knowledge needs to be codified and distributed; and innovation is a permanent feature.

Along with physical infrastructure, educational and technical skill development forms the platform for effective connectivity. One cross country study finds that a one year increase in average schooling results in a one percentage point increase in PC penetration. [50]

[49] Jean-Eric Aubert and Jean-Louis Reiffers. (ed.) The World Bank. 'Knowledge Economies in the Middle East and North Africa: Toward New Development Strategies'. p 21. http://topics.developmentgateway.org/knowledge/rc/filedownload.do~itemId=377316

[50] Menzie D. Chinn and Robert W. Fairlie. 'The Determinants of the Global Digital Divide: A Cross-Country Analysis of Computer and Internet Penetration'. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=510182

Most of the developed countries, with Access Accelerator features, have already put in place systems for educational advancement and knowledge processing in line with the dictates of what a knowledge society.

Most of the developed countries, with Access Accelerator features, have already put in place systems for educational advancement and knowledge processing in line with the dictates of what a knowledge society. Of those in the lead are the OECD countries where an estimated 8 percent of GDP is being spent on knowledge related investment initiatives.

Box 13
Trends in Knowledge and Innovation in the OECD Countries

At about 8 percent of GDP, knowledge-related investment (comprising R&D, software, and public education) is equal to investment in equipment. It has grown much faster than GDP and has tended to replace classical investment in equipment.

Learning: The great majority of active adults have reached at least the primary and lower secondary levels of education. However, differences among countries are greater for the upper secondary cycle and higher education (in the OECD area as a whole, over 14 percent of the labor force has a university degree).

Research and development: OECD countries allocate an average 2.2 percent of GDP to R&D. Countries that are rapidly "catching up" (Korea, Ireland) have relatively high percentages (2.8 percent and 1.5 percent, respectively). The business sector tends to represent an increasing share of R&D (50 percent and more in advanced economies).

Information and communications technology: Spending on ICT rose sharply during the mid-1990s in the OECD area to more than 6 percent of GDP and more than 8 percent in the countries most actively engaged in such technologies (Australia, New Zealand, Sweden, the United States). The OECD area also has by far the greatest share of computers and over 90 percent of Internet access. As Internet penetration is closely linked to cost, the countries in which the cost of Internet access is low are also those with the most developed services.

Jean-Eric Aubert and Jean-Louis Reiffers. (ed.) The World Bank. 'Knowledge Economies in the Middle East and North Africa: Toward New Development Strategies'. p 22.
http://topics.developmentgateway.org/knowledge/rc/filedownload.do~itemId=377316

In Access Seeker category countries, education divide is a precursor to access-divide with modern ICTs being used by only those with the highest education.

In Access Seeker category countries, education divide is a precursor to access-divide with modern ICTs being used by only those with the highest education. For example, in Ethiopia where 65 percent of the overall population is not literate, 98 percent of internet users have a university degree. [51]

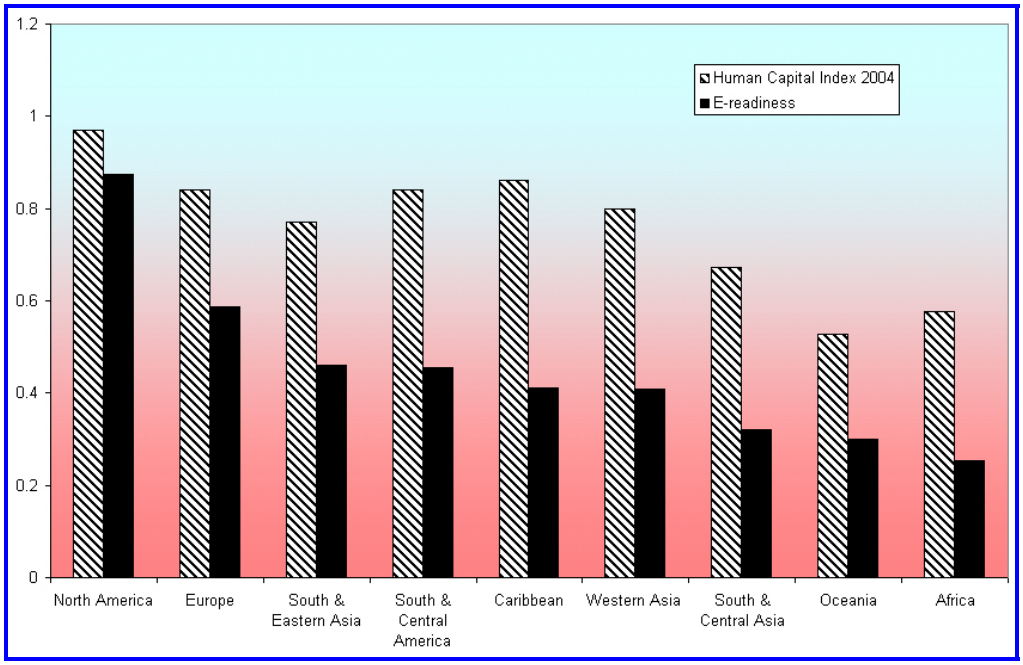
The peoples of the developing world are also becoming aware of the importance of incorporating the necessary ICTs into education. They understand that failing to do so is likely to impact on widening the existing digital disparities and mar their chances in an integrated globalized knowledge society. In an online survey conducted by the ITU sixty three percent of the responders said that adapting all

[51] Ibid. p 17.

primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances was very important.[52]

However, at present wide disparities exist in the ways countries use and employ skills and knowledge. The link between low human capital and e-government readiness is shown in Graph 6.5 below. Even though the **educational access-divide**, in general, is far less acute than the infrastructure access-divide, primarily due to decades of past investment in education in most of the world regions, considerable differences remain. Average regional human capital indices for Africa and Oceania remain half that in North America and Europe indicating that a much greater effort will be required to yield access for all.

Graph 6.5
Education Access Divide 2004



Not only do many developing societies need to upgrade their overall education they require a re-thinking of the traditional models of educational development for knowledge management and integration into the information society. Calculated from the World Bank database, Table 6.7 presents selected countries by their 'knowledge index' (KI) which reflects a country's performance based on its education, innovation and ICT. Education comprises indicators of literacy and enrolment, including secondary and tertiary enrolment both of which are important in setting the framework of lifelong learning. Innovation is the other key component illustrating 'how well' the education system is being put to use. Researchers in R&D, patent applications granted by the US Patent and Trademark Office (USPTO), and scientific and technical journal articles combine to represent the level of innovation

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[52] International Telecommunication Union
http://www.itu.int/newsroom/wtd/2004/survey/results.asp

in an economy. Information infrastructure provides the supporting conduits which carry information. [53]

Table 6.7
Educational level and Knowledge Utilization, selected countries

Country	Knowledge Index	Innovation	Education	Information Infrastructure
Finland	9.31	9.63	9.17	9.13
Norway	9.07	8.81	8.98	9.41
USA	8.95	9.39	8.43	9.03
Australia	8.81	8.62	9.14	8.67
Netherlands	8.77	8.64	8.65	9.02
UK	8.74	8.53	9.01	8.68
Belgium	8.48	8.55	8.81	8.09
Korea	8.29	8.04	7.80	9.03
Singapore	7.80	8.67	5.61	9.13
Argentina	6.37	5.97	7.13	5.99
Chile	5.98	5.39	5.72	6.83
UAE	5.55	5.75	3.37	7.52
Lebanon	5.46	5.03	5.31	6.05
Brazil	5.37	4.74	5.55	5.82
Mexico	4.81	4.57	4.61	5.24
Thailand	4.77	3.58	5.80	4.94
Saudi Arabia	4.69	5.33	3.68	5.07
Botswana	4.45	5.17	3.75	4.43
Turkey	4.38	4.21	3.40	5.53
Kazakhstan	4.29	4.00	6.30	2.56
Mauritius	4.26	2.54	3.81	6.44
Peru	4.23	2.86	5.22	4.60
Mongolia	3.89	3.27	5.50	2.88
China	3.84	4.13	3.04	4.35
China	3.84	4.13	3.04	4.35
Iran	3.58	3.33	3.42	4.00
El Salvador	3.15	2.02	3.21	4.22
Morocco	2.82	3.29	1.85	3.32
Kenya	2.45	3.55	1.88	1.92
India	2.43	3.20	2.13	1.95
Honduras	2.05	0.75	2.41	2.99
Guatemala	1.83	0.54	1.99	2.96
Zambia	1.67	2.00	1.54	1.46
Cameroon	1.48	1.52	1.69	1.23
Benin	1.36	2.42	0.72	0.94
Pakistan	1.28	1.68	0.94	1.23
Bangladesh	0.93	0.93	1.47	0.40
Malawi	0.91	1.29	0.96	0.47

KI (Knowledge Index) is the simple average of the performance of a region or country in three KE pillars: Education, Innovation and Information Communications & Technology.
Source: Calculated from The World Bank. Knowledge Assessment Matrix (KAM) database.
http://info.worldbank.org/etools/kam2004/weighted/mc.asp

Countries such as Finland, Norway, and the United States which top the list blend the right mix of education with innovation and infrastructure. These are the countries which would be termed as being past the access threshold since they 'blend' the access elements to reach the right threshold access. Still other countries

[53] Information infrastructure comprises telephone mainlines and mobile phones; computers and Internet users per 10,000 population.

are in the process of doing so. Countries such as Chile, the United Arab Emirates and Lebanon are Access Builders. As the model illustrates countries may move to access threshold with the right blend of the various access elements. For example, Kazakhstan with a medium 4.0 innovation and a low 2.56 infrastructure but a high 6.0 education index has a KI higher than Mauritius which has three times its infrastructure but around half its education and innovation index. Once countries attain the threshold level higher, 'real access' drives educational, social and cultural changes to lead to higher ICT access.

4. Lack of access to the web language: English Language domination

View these facts:

- There are approximately 287 million native English speakers and 517 million non-English speakers online. [54]
- Around 71 % of those with internet access speak a native language other than English. [55]
- Web users are up to four times more likely to purchase from a site that communicates in the customer's language. [56]
- Site stickiness is doubled when a website is translated - visitors stay for twice as long.
- Almost one-third of websites are presented in a language other than English.
- 37 million Americans do not speak English at home.

In a society where knowledge and information create wealth and social transformation language is the main vehicle for communication. In this environment the opportunity to use one's language on global information networks such as the internet determines the extent to which one can participate in the emerging knowledge society. [57]

There are two conduits to this **language access-divide** created by the dominance of English as a world language both of which, unless addressed, are likely to exacerbate disparities.

One is that the majority of ICT and technical courses, books and manuals are written in the English language. However, it is native to only eight countries: the U.S, the United Kingdom, Ireland, Canada; Australia, New Zealand, South Africa, and the Philippines and is used widely online in India. It is not widely understood in Japan, Germany, China or the Southern European countries or throughout most of South and Central America. However, an estimated 87 percent of documents on the internet are in English. [58] Also as we have seen above, increasingly e-government

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[54] See table below.
[55] Ibid.
[56] The facts appearing below are taken from WorldLingo.
http://www.worldlingo.com/resources/language_statistics.html.
[57] UNESCO.
http://portal.unesco.org/ci/ev.php?URL_ID=1536&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1085145184
[58] Kevin Taglang . 'Content and the Digital Divide: What Do People Want? '.Benton Foundation
.

The UN Global E-government Survey 2004 confirms that English continues to dominate e-government websites with 128 national websites offering English either as primary language or in addition to the native language.

information and services are being offered in English in non-English speaking countries. This has the potential of marginalizing all those who do not speak English, especially as it relates to employment, and income and opportunity. (See Box 14.)

The UN Global E-government Survey 2004 confirms that English continues to dominate e-government websites with 128 national websites offering English either as primary language or in addition to the native language.

Table 6.8
Some measures of English language domination

	Number	Percent
Total # of countries	178	100
• Countries with a national site	172	97
• National sites with English	128	72
• Countries with some Ministry sites in English	2	1
English language content websites		
All countries offering some English language content	130	73
Of these:		
1. Mirror sites in English	64	36
2. Sites with some English:		
Heavy (more than 75%)	32	18
Medium (between 25 – 75 %)	26	15
Light (0- 25 %)	8	4
No English	44	25

In an effort to quantify the English language domination this year, researchers were asked to briefly evaluate the extent of English being offered. While 64 countries have English as the primary site-language, another 68 offer English in addition to their native language, albeit to a different extent. Out of the 68, 32 offered more than 75 percent of their native language content in English as well; 26 provided roughly half while only six countries had very light use of English as the second language. Some countries such as Ghana and Kuwait did not provide English on their national site; however they both had Ministerial sites with English-language content.

Table 6.9
E-Government sites in English, selected regions 2004

Region	Total No. of countries	Government sites in English	
		Total	%
Africa	43	26	60
South and Eastern Asia	15	12	80
South & Central Asia	13	13	100
Western Asia	14	12	86
South & Central America	19	4	21

One hundred percent of the countries in South & Central Asia had some content in English, while in South and Central America the ratio is 21 percent. In South & Central Asia several countries had English as a primary language, while others such as Kazakhstan, Turkmenistan, Uzbekistan, and Iran also provided considerable

http://www.digitaldividenetwork.org/content/stories/index.cfm?key=14

content in English. The use of English in all 13 countries could be tied to the region's overall progress in e-government year over year. On the other hand only 4 out of 19 countries in South & Central America had any level of English content on their national sites. While Spanish/Portuguese are clearly the primary languages for the region it is striking that the region, as a whole, lags behind the world average in having any English content.

Notwithstanding English as the language of choice for websites, the available online content in English differs widely between countries. For example, Germany's national portal, http://www.deutschland.de, has created "mirror" pages in five languages in addition to German, including English. No matter what language is the preference of the visitor, the site will look the same and feature the same information and links. The same is the case with the Canadian portal, http://www.canada.gc.ca, which provides comprehensive mirror sites in English and French.

On the other hand, Denmark's national portal, http://www.danmark.dk, has taken a different approach. While the site offers an English version, it is completely different in content and design from the native Danish version. In Danish the user will find extensive public services and local links while the English version is clearly targeted towards business, travel, culture, studies, and other such things that would interest a citizen from another country who is likely to search for such information in the English language. Hungary's national portal, http://www.magyarorszag.hu, too, has embarked on the road to promote and inform about the country in its English language version as opposed to providing mirror pages.

With 75 percent of sites using English, and around 70 percent of these offering at least half of their national site content in English, it is clear that that English has become the language of choice for e-government.

Table 6.10
Languages of the internet
Total world population is taken to be 6330 million.

	No of speakers as primary language; million	*% of world population*	*% of world online users*	*% of web content written in each language*
English	341	5.4	39.4	68.4
Non-English	5989	94.6	70.9	32.6
Chinese	1200	19.0	14.1	3.9
Hindi	366	5.8	..	..
Spanish	358	5.7	9.0	2.4
Arabic	293	4.6	1.4	..
Portuguese	176	2.8	3.5	1.4
Russian	167	2.6	2.5	1.9
Japanese	121	1.9	9.6	5.9
German	100	1.6	7.3	5.8
French	77	1.2	3.8	3.0
Turkish	61	1.0	0.8	..
Korean	42	0.7	4.1	1.3
Ukrainian	31	0.5	0.1	..

Source: Based on data from the Global Internet Statistics. http://global-reach.biz/globstats/index.php3.
Data on No. of speakers in each language from Ethnologue http://www.ethnologue.com/country_index.asp

A second broader impact is due to the overwhelming dominance of English language content on the WWW. A non-English speaker is most likely to surf for information in his/her own language. For example, take the case of the average

person in India which houses around 15 percent of the world's population. Most of the rural populations of South Asia cannot speak English. Even though native Hindi is in the top 9 most widely spoken languages it does not have a significant share of Web content denying de facto access to millions. With negligible content in Hindi, an average native speaker in India is unlikely to find a lot of interest to him/her in either language. Users worldwide may be conversant in English, but their interest in using the internet has to happen in their own language. In an attempt to measure this interest, an online survey conducted by the ITU in May 2004 found that 53 percent of the responders said that encouraging the development of content and technical conditions to facilitate the presence and use of all world languages on the internet was very important.[59]

Box 14
India's language barrier to computing

In India, computers that work in English alone are leaving hundreds of millions of potential users out in the cold. The hundreds of millions of Hindi speakers, and the hundreds of millions on the subcontinent who speak Bengali, Urdu and other Indian languages, would like to make computers their own. But their problems start at the keyboard, since there is a big difference between Indian-languages and English when it comes to reading and writing on computers.

Keyboards designed for the English language alphabet must be adapted, with special software, so that their keys can produce Indian texts. This software constructs Indian language characters out of smaller pieces known as glyphs. For example, the South Indian Kannada language pieces together 142 glyphs in thousands of combinations to produce words based on Kannada's 49 characters.

In defining global standards for computing, the special needs of less influential nations seem to get sidetracked. To complicate matters, early researchers working on this issue in India constructed their own sets of glyphs or character pieces. This often meant that text composed on one computer could not be read on another loaded with rival software. This was a great handicap since it is the ability of computers to talk to one another that makes them such powerful tools.

As computing spreads across India, these language-based digital divisions persist even today. Recently, the South Indian states of Karnataka and Tamil Nadu pushed ahead with standards of their own. And small firms like Mithi in the central Indian city of Pune have worked out their own solution to send and receive e-mail in 11 Indian languages besides English.

BBC News. Monday, 24 December, 2001
http://news.bbc.co.uk/1/hi/sci/tech/1719346.stm

And this lack of access is not limited to Hindi-speakers. At present thousands of languages worldwide are absent from internet content and large sections of the world's population are thus prevented from enjoying the benefits of technological advances and obtaining information essential to their wellbeing and development.

[59] International Telecommunication Union
http://www.itu.int/newsroom/wtd/2004/survey/results.asp

Unchecked, this will contribute to a loss of cultural diversity on information networks and a widening of existing socio-economic inequalities. [60]

On an aggregate level, Table 6.10 shows that non-English speakers the world over may have a handicap in accessing knowledge. For example, for about 102 million Chinese only 4 % of the web content is in Chinese. Assuming 20 million of those speak English, about 82 million Chinese cannot access the information and knowledge on the WWW. Nearly 70 percent of the Web content is written in English and around 40 percent of internet users access the internet in English while only 5% of the world's population speak English as the native language.

Exclusion due to language remains a serious contributory factor in this lack of access issue. Consider a computer literate-online-native user who cannot benefit from the vast amount of information his/her government has put out in English – the government's preferred choice of online communication. Lack of local language and content is consistently cited a major constraint to usage in many countries. Dominance of English is one aspect of this **language access-divide**. Moreover, with language domination follows content and culture bias.

In nations that fall in the Access Accelerators category, English is either the native language or it is widely spoken and understood. Other global leaders, where English is not the native language, have realized this. For example, Japan is going a step further, and is in the early stages of implementing universal English as a Second Language (ESL) curriculum throughout its primary educational system. For still others there is value in following a two pronged approach to language and content development: i) encouraging the take-up of English language in schools; and ii) development of local language web based resources indigenously, especially as they relate to public provision of basic services.

5. Lack of relevant content

The arguments above hold true for content as well.

The cornerstone of a successful ICT for development strategy is effective use of ICT. No amount of supply side maneuvers and planning will help if the user does not employ the services. People are more apt to use e-government services if they can find relevant content that they are looking for. The concept of 'what is relevant' is directly related to indigenous conditions and the culture. A person in the rural areas of East Asia is likely to be interested primarily in information and services which impact his/her daily life.

The concept of 'what is relevant' is directly related to indigenous conditions and the culture.

Public and private sector websites in the US know this. Accordingly hundreds of sites display information about basic health, education and other issues of likely interest to the average American. According to one survey in the US, about half of American adults search online for 16 health topics, ranging from disease information to smoking cessation strategies. For example, health seekers go online to become

[60] UNESCO. http://portal.unesco.org/ci/ev.php?URL_ID=1536&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1085145184

For societies that are multi-ethnic and multi-cultural appropriate content could be vastly important in bridging inequalities of race, income and opportunity.

informed, to prepare for appointments and surgery, to share information, and to seek and provide support. [61]

E-information and e-services about issues such as health, education and employment; national and community level e-services are all relevant content. For societies that are multi-ethnic and multi-cultural appropriate content could be vastly important in bridging inequalities of race, income and opportunity.

There are 7 measures of market maturity for online content in a country. [62] These are:

i. total number of websites about (and published in) the country;
ii. local relevance and usefulness of this content;
iii. local language standardization and usage on the Web;
iv. amount of sub-national content (about states, provinces, cities);
v. presence of meta-content like directories and search engines;
vi. overall advertising revenues targeted at online audiences via these sites (e.g. via banner ads);
vii. the presence of third-party services from online traffic auditors, ad revenue auditors and market research groups.

Appropriate content requires an indigenous home-grown approach to ICT for development.

Appropriate content requires an indigenous home-grown approach to ICT for development. With ICT and e-government planning in the initial stages in most developing countries around the world, less attention is being paid to indigenous and culturally relevant content which needless to say requires additional financial, human and technical resources.

The resulting **content access-divide** is wide. Like in other access elements much of the content available to the user originates in the developed economies and comes with its own inherent biases. A recent survey shows that Africa generates 0.4 % of global content. If South Africa is excluded the rest of Africa generates 0.02 percent. [63] Disparities in access within a country are severe and related to the level of income and education levels. On the other hand, the United States alone produces about 40% of the world's new stored information, including 33% of the world's new printed information, 40% of the world's information stored on optical media, and about 50% of the information stored on magnetic media. [64]

A few developing countries have taken the lead in developing indigenous relevant content for populations with native speaking ability. The key objective of these initiatives is to promote the creation and use of content for their respective communities. Government sponsored initiatives in Singapore and Thailand are being pursued to develop local language content on the web. (See Box 15). In Egypt, the government is aiming to take the lead in "Arabizing" software for the

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[61] Pew Internet and American Life Project. http://www.pewinternet.org/PPF/c/5/topics.asp
[62] Dr. Madanmohan Rao. 'The nature of the information society: A developing world perspective'. Background paper for the ITU. P.9. http://www.itu.int/osg/spu/visions/papers/developingpaper.pdf
[63] The Networking Revolution: Opportunities and Challenges for Developing Countries. InfoDev Working Paper Series. The World Bank Group. June 2000. p16.
[64] Including 33% of the world's new printed information and 30% of the world's new film titles. http://www.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm#summary

Middle East region as part of its National Plan for Telecom and Information.[65] The Tamil-speaking diaspora have launched an initiative to boost the Sri Lankan Tamil language content and online tools on the internet; a similar initiative was launched by the 'Speak Mandarin' campaign in Singapore. Local language Web content initiatives have also been launched for developing country languages like Marathi in India.[66]

Box 15
Content creation in Singapore and Thailand

In Singapore, a variety of Government-sanctioned Internet-related projects have been created in Singapore to address the diversity of cultures. Specifically, the Chinese, Tamil and Malay communities have created Internet portals that promote the use of these native languages in cyberspace. http://www.itu.int/ITU-D/ict/cs/singapore/material/Singapore.pdf.

With penetration rate of just 29 percent—limited to the most affluent Thais—Internet penetration in Thailand has not yet reached critical mass. The key barrier facing most potential Internet and ICT users in the country is the lack of Thai-centric content. To address this problem and help spur interest in the Internet, companies such as Microsoft, Terra Lycos and M-Web have begun initiatives to incorporate Thai into their program and portal designs. M-Web in particular, by purchasing the most popular Thai portal, Sanook.com, intends to incorporate Thai content on its websites and browser software. Improving knowledge of the English language may also be a means for the Government to increase accessibility. http://www.itu.int/ITU-D/ict/cs/thailand/material/THA%20CS.pdf.

Source: From: http://www.itu.int/osg/spu/wsisthemes/ict_stories/Innovativeictimplementations.html

A knowledge society is not just about connectivity to the global information infrastructure then, but also about content that is accessible, the communities that congregate online and offline, the embedded and emerging cultural attitudes, the commercial and other motives behind such activities, an attitude of cooperation and lifelong learning, and a capacity for creating and governing information spaces. It is not about passively using technologies, but about actively creating and shaping the underlying technical, information and service infrastructure. [67]

6. Lack of affordability

The demand for ICT by the user is closely linked to its cost.

The demand for ICT by the user is closely linked to its cost. Even though recent years have seen a dramatic decline in the average cost of technology, it remains unaffordable for the vast majority of populations in low income developing countries and especially for those in poor households. There is a clear link between lack of affordability and access to technology. People with low incomes are also

[65] International Telecommunications Union. http://www.itu.int/osg/spu/wsis-themes/ict_stories/Innovativeictimplementations.html
[66] Dr. Madanmohan Rao. 'The nature of the information society: A developing world perspective'. Background paper for the ITU. P.8. http://www.itu.int/osg/spu/visions/papers/developingpaper.pdf
[67] Dr. Madanmohan Rao. 'The nature of the information society: A developing world perspective'. Background paper for the ITU. P.8. http://www.itu.int/osg/spu/visions/papers/developingpaper.pdf

more likely to have low levels of appropriate technological skills and lack of access to technology, both of which in turn, limit their income and opportunities. Around 60 percent of all responders in a survey conducted by one research firm said the 'cost was too high'; or they didn't know how to use the computer or did not have a computer as among the main reasons for staying offline. [68] In another statistic, around 40 percent of Peruvians said they 'either did not have a computer or could not afford Internet services'. [69]

There is a clear link between lack of affordability and access to technology. People with low incomes are also more likely to have low levels of appropriate technological skills and lack of access to technology, both of which in turn, limit their income and opportunities.

Though there is a positive functional relationship of digital access with the cost and quality of ICTs, people in many developing economies are not able to afford modern technologies. The ITU Digital Access Index (DAI) is presented below for 138 countries of the world by high, medium and low access countries. High access countries are characterized by infrastructure access for all, affordable prices, high knowledge levels with efforts being made for enhancing quality through the provision of faster access. The main criterion that distinguishes economies in this category is usage.[70] This category closely corresponds with the Access Accelerators. Countries with medium access have less availability of the same elements. On the other hand, low access countries, corresponding to the Access Seekers, have a minimal level of access characterized by the infrastructure availability to only the top few. For the majority communication infrastructure has a very high access prices.

As can be seen, countries with high DAI have high access indicators. As Table 6.11 and Graph 6.6 show countries with a high digital access index are likely to have a high quality and high affordability indices as well. The opposite is true as well. One major reason for low income countries to be found among the low DAI countries is that technology costs remain high in these countries. Fifty five low access countries had an average affordability index of 0.07 compared to 0.98 among the high access countries.

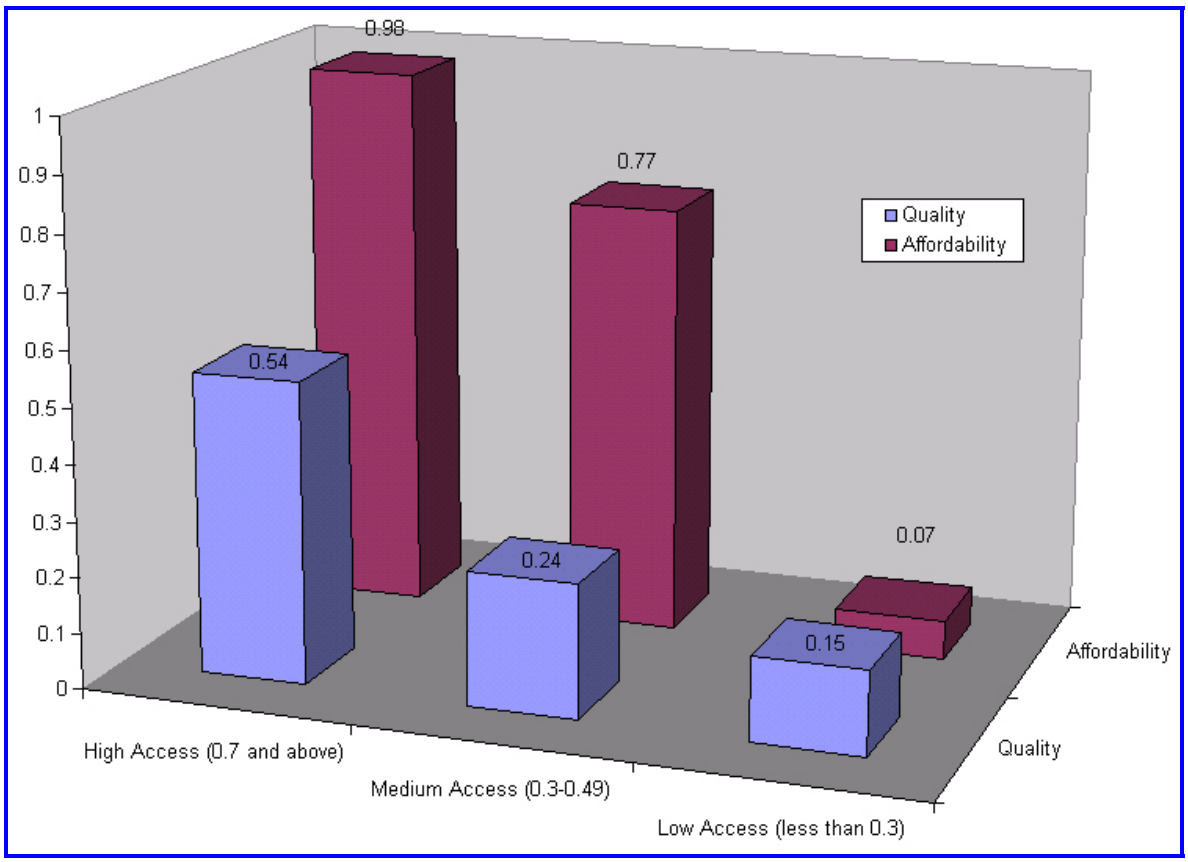
Table 6.11
Measures of affordability

Countries with Digital Access Index as:	*No. of countries*	*Affordability*	*Quality*
High Access (0.7 and above)	25	0.98	0.54
Medium Access (0.3-0.49)	58	0.77	0.24
Low Access (less than 0.3)	55	0.07	0.15

Note: On a scale of 0 to 1, highest access = 1. Internet access price as the percentage of Gross National Income per capita is used as a proxy of affordability while International Internet bandwidth (bits) per capita and broadband subscribers per 100 inhabitants are combined to form the indicator of quality.
Source: Calculated from International Telecommunications Union Digital Access Index database.
http://www.itu.int/newsarchive/press_releases/2003/30.html

[68] http://www.ipsos-na.com/news/pressrelease.cfm?id=1244&content=full
[69] International Telecommunication Union.
http://www.itu.int/newsarchive/press_releases/2003/30.html
[70] For details see World Telecommunication Development Report 2003: Access Indicators for the Information Society. Pp 99-113.

Graph 6.6
Affordability Access



More often than not, lack of affordability of the new technologies is a function of poverty. The **affordability access-divide** cuts across the global and national access-divides, and is vast. This is evident in the high cost of using the internet in many countries belonging to the lower and low income group. In African countries such as Niger the cost of a month's usage of the internet is US$97 and around 7 times the monthly income of a person. By contrast, in the United Kingdom the cost of the same is half and a mere 1 percent of the monthly income. Table 6.12 below gives the internet costs and monthly incomes per capita for the top and bottom few countries by region.

The affordability access-divide cuts across the global and national access-divides, and is vast.

There are gross access disparities in affordability within regions as well. In South and Eastern Asia, the internet costs 5 times as much in Cambodia as it does in the Republic of Korea. In the Republic of Korea itself these costs are a mere 1 percent of the monthly budget of a person compared to Cambodia where poor households are likely to spend about two and half times their monthly income on internet usage alone.

Table 6.12
Affordability indicators

Region / Country	*Cost of internet per month US$ a)*	*% of monthly GNI per capita*
Africa		
Mauritius	15.0	4.7
South Africa	33.0	15.4
Ethiopia	27.0	329.1
Mali	58.0	289.8
Niger	97.0	683.6
South and Eastern Asia		
Republic of Korea	10.0	1.2
Singapore	11.0	0.6
Japan	21.0	0.8
Cambodia	57.0	245.8
China	10.0	13.0
Lao P.D.R.	32.0	62.1
South-central Asia		
Kyrgyzstan	15.0	62.1
Kazakhstan	34.0	27.4
Bangladesh	20.0	66.8
India	9.0	21.9
Pakistan	16.0	45.7
Western Asia		
Israel	28.0	1.4
Oman	24.0	3.8
Syria	55.0	58.6
Yemen	31.0	75.3
Europe		
Denmark	18.0	0.7
United Kingdom	24.0	1.1
Sweden	22.0	0.7
TFYR Macedonia	21.0	6.3
Republic of Moldova	19.0	49.6
Albania	29.0	24.8
Caribbean		
Jamaica	17.0	1.0
Trinidad & Tobago	13.0	2.5
Grenada		
Cuba	58.0	32.2
South and Central America		
Chile	22.0	6.1
Mexico	23.0	4.6
Argentina	13.0	3.9
Guatemala	31.0	21.4
Honduras	41.0	52.9
Nicaragua	51.0	138.6
Northern America		
United States	15.0	0.5
Canada	13.0	0.7
Oceania		
Australia	18.0	1.1
New Zealand	13.0	1.1
Papua New Guinea	20.0	45.3

a)= Cost of 20 hours of use per month in 2003.
Source: The World Bank. World Development Indicators 2004. Table 5.11: The information age.
http://www.worldbank.org/data/wdi2004/pdfs/Table5_11.pdf

In summary the above chapter has outlined a model for accelerating Access-for-Opportunity presented by integrating ICTs into development. It has also shown that the majority of the developing country population of more than 5 billion faces a grave challenge from the rapid diffusion of ICTs which has created serious divides.

One of the central obstacles in ICT-for-opportunity is the current access-divide which appears across the world, not only across regions such as Africa where it is commonly perceived to exist, but also within individual countries due to the fact that in most countries only the well off currently have access to opportunity; these divides have to be bridged for regions and countries to reach full ICT-for-Opportunity capability.

In this context, those developing countries, which have in place the right mix of reforms, institutions and programs will no doubt benefit from the ICTs, but many are likely to be mired in a cycle of low income, poverty and a growing disparity in access to modern technology.

However, despite evidence of the current divide in access to opportunity between – and among – countries it should not be cause for inaction. The promise of the new technology is indeed the tremendous opportunity inherent in it. The opportunity that associated with it is the opportunity to leap frog development and provide millions with higher standards of living and greater empowerment.

Chapter VII

VII. Conclusions

Consolidation of e-government programs has taken the route of promoting awareness about policies and programs, approaches and strategies to the citizen, which lay down the foundation of an informed knowledge society. More and more information about education, health and employment is online, and other public services are fast becoming available online.

Broad trends of e-government development around the world in 2004 reaffirm that political ideology, economic and social systems; level of development; resource availability, human and technological infrastructure; institutional framework and cultural patterns all have a bearing on how, and how well, both e-government and ICT-for-development initiatives are utilized.

Many countries around the world are fortifying their e-services and expecting to leapfrog to e-health, e-learning, e-government applications, networking, and other web services. With mature infrastructure and educational systems these mostly high level economies have further advanced the scope and coverage of their e-government programs in 2004. The effort towards a knowledge society is especially evident in these governments' efforts to engage multi stakeholders in government decision-making. These governments have expanded participatory services online through the use of innovative e-participation portals and online consultation mechanisms encouraging citizen feedback on important economic and social policy issues.

In e-government program development a strong strategic consensus appears to be developing around implementing integrated portals to facilitate access to the citizen by making all government information and services available through "one-stop-shops" and e-service portals. Still, many others are taking an incremental approach to e-government service delivery with concurrent, but not necessarily integrated, advances in infrastructure and development and access outreach. Others are implementing models which focus on sustained and paced across-the-board e-government and ICT development.

However, progress is not uniform across regions, or between countries.

An important finding of the 2003 Survey was that not many countries utilized the full potential of e government to provide information and services to their citizens.

This still holds for the majority of the countries. One of the central obstacles in ICT-for-Opportunity is the current access-divide which appears globally, not only in regions such as in Africa where it is commonly perceived to exist, but also within individual countries where only the well off have access to opportunity; these divides need to be addressed in order for countries and regions to reach full ICT-for-opportunity capability.

- The 40 least e-ready countries show little relative progress compared to the developed countries which are already far advanced in their provision of public information and services and their outreach and access to citizens.

- Continued limited access to both ICT and education infrastructure in the developing countries impedes their ability to utilize the full potential of either e-government or ICTs in development.

- For citizen participation through e-government as well, progress is uneven and mostly limited to a handful of developed economies.

- Real Access-for-Opportunity is limited to relatively few countries and groups in the world. The likelihood that many developing countries and vast groups of the global population may never achieve their own knowledge society, or participate in the emerging global knowledge society, is very real.

What is clear from the 2004 Survey is that the "Access Divide," a new concept and distinguishable from the longer-lived digital divide, is fast becoming a critical issue for developing nations. The Access Model developed herein, admittedly an initial attempt to capture and conceptualize what promises to be a rich and complex theory, helps to understand the impending access crisis, and can help guide governments in their attempts to address the issue head-on.

Exploring the access-divide elements the Access Model illustrates that the majority of the developing country population of more than 5 billion faces a grave challenge from the new technological revolution. Whereas some of the developing countries which have in place the right mix of reforms, institutions and programs will no doubt benefit from the ICTs, most are likely to be mired in a cycle of low income, poverty and a growing disparity in access to modern technology.

The Road Ahead

Whereas there exists an overwhelming evidence of the current gap in access to opportunity between and among countries it should not be cause for inaction. The promise of the new technology is indeed the tremendous opportunity inherent in it – the opportunity that developing nations can leap frog development and provide millions with higher standards of living and greater empowerment.

Key imperatives for governments which emanate from the Access Model include:

Governments Need to Adopt Access-for-Opportunity as a Policy Goal: Governments must specifically identify and address issues of real access – utilizing the Access Model put forth herein – rather than on issues of technology. The end goal should be Access-for-Opportunity, rather than solely access to ICT. In this context the governments need to develop and formally adopt E-government Plans and/or similar national ICT Plans that include access goals, economic development objectives, and long term goals to achieve a knowledge economy/society.

Governments Need to Adopt Access-for-Opportunity as a Policy Goal

Governments Need to Focus on Knowledge Societies: Governments need to re-think and re-engineer their development strategies towards building knowledge societies. A renewed commitment is needed to put ICTs within an integrated development framework to leapfrog the traditional long gestation phases of development and yield rapid economic and social progress for all.

Governments Need to Focus on Knowledge Societies

Governments Need to Include ICTs in All Planning Initiatives: To improve Access-for-Opportunity countries must recognize the centrality of ICTs, and include the concept into all development planning and encourage the use of ICTs by making more services available through their e-government initiatives. The governments need to include ICT planning across all government sectors, particularly public education, public health, economic development, commerce and industry, law enforcement and security, and others – this integrated planning will lead to real E-Government and ICT for development. E-government and ICT goals should be clearly articulated in terms of economic development and quality of life enhancements for all members of society.

Governments Need to Include ICTs in All Planning Initiatives

Furthermore, the governments must follow adoption of high level E-Government and ICT policies with the development of comprehensive regulatory and legal frameworks that directly support ICT for development; key areas include e-commerce, anti-cyber-crime enforcement, digital contracts, online intellectual property and copyright protection, approaches to internet taxation and fees, adoption of international online standards, and other key areas. Governments must integrate new technology tools and the culture of technology into public education strategies and curricula at all levels. Developing nations lacking physical ICT infrastructure available to rural and semi-rural areas should develop and implement plans for wireless and other less resource intensive technologies; these governments should work closely with the private sector to establish "virtual" infrastructure that will provide access opportunities to disconnected groups and individuals.

…adoption of high level E-Government and ICT policies with the development of comprehensive regulatory and legal frameworks that directly support ICT for development;

In addition, the governments need to educate the upcoming ranks of government leaders, managers and administrators in planning and managing ICTs across all public sectors, focusing on access opportunity, economic development, and effective delivery of public information and services. National governments also need to encourage government agencies, businesses, their citizens and all of civil society to fully embrace the emerging global language and culture of technology while simultaneously facilitating the creation of quality local digital content and online services for the spread of development opportunities for all.

… governments need to educate the upcoming ranks of government leaders, managers and administrators in planning and managing ICTs across all public sectors, focusing on access opportunity, economic development, and effective delivery of public information and services.

Annex 1: Annex Tables

Table 1 E Readiness Index 2004

	Country	
1	United States	0.9132
2	Denmark	0.9047
3	United Kingdom	0.8852
4	Sweden	0.8741
5	Republic of Korea	0.8575
6	Australia	0.8377
7	Canada	0.8369
8	Singapore	0.8340
9	Finland	0.8239
10	Norway	0.8178
11	Netherlands	0.8026
12	Germany	0.7873
13	New Zealand	0.7811
14	Iceland	0.7699
15	Switzerland	0.7538
16	Belgium	0.7525
17	Austria	0.7487
18	Japan	0.7260
19	Ireland	0.7058
20	Estonia	0.7029
21	Malta	0.6877
22	Chile	0.6835
23	Israel	0.6805
24	France	0.6687
25	Luxembourg	0.6600
26	Italy	0.6598
27	Slovenia	0.6506
28	Czech Republic	0.6214
29	Poland	0.6026
30	Mexico	0.5957
31	Portugal	0.5953
32	Argentina	0.5871
33	Hungary	0.5857
34	Spain	0.5844
35	Brazil	0.5675
36	Greece	0.5581
37	Slovakia	0.5565
38	Romania	0.5504
39	Latvia	0.5486
40	Uruguay	0.5481
41	Bulgaria	0.5417

42	Malaysia	0.5409
43	Lithuania	0.5367
44	Colombia	0.5335
45	Ukraine	0.5326
46	Bahrain	0.5323
47	Philippines	0.5260
48	Croatia	0.5227
49	Cyprus	0.5189
50	Thailand	0.5096
51	Mauritius	0.5055
52	Russian Federation	0.5017
53	Peru	0.5015
54	Panama	0.4907
55	South Africa	0.4902
56	Venezuela	0.4898
57	Turkey	0.4892
58	Belarus	0.4888
59	Jamaica	0.4793
60	United Arab Emirates	0.4736
61	Trinidad and Tobago	0.4670
62	Bahamas	0.4649
63	Brunei Darussalam	0.4632
64	Saint Lucia	0.4616
65	Barbados	0.4563
66	Kyrgyzstan	0.4468
67	China	0.4356
68	Jordan	0.4347
69	Kazakhstan	0.4344
70	Seychelles	0.4259
71	Guyana	0.4243
72	Saint Kitts and Nevis	0.4231
73	Costa Rica	0.4188
74	Lebanon	0.4163
75	Mongolia	0.4152
76	Belize	0.4150
77	Dominican Republic	0.4111
78	Maldives	0.4106
79	El Salvador	0.4034
80	Qatar	0.4005
81	Uzbekistan	0.3965
82	Ecuador	0.3924
83	Armenia	0.3919
84	Fiji	0.3912
85	Indonesia	0.3909

86	India	0.3879
87	Serbia & Montenegro a)	0.3871
88	Bolivia	0.3863
89	Azerbaijan	0.3861
90	Saudi Arabia	0.3858
91	Botswana	0.3827
92	Samoa	0.3793
93	Bosnia and Herzegovina	0.3790
94	Georgia	0.3784
95	Tonga a)	0.3781
96	Sri Lanka	0.3748
97	The former Yugoslav Republic of Macedonia	0.3699
98	Dominica	0.3681
99	Antigua and Barbuda	0.3657
100	Kuwait	0.3649
101	Swaziland	0.3647
102	Grenada	0.3588
103	Iraq a)	0.3566
104	Cuba	0.3478
105	Suriname	0.3474
106	Republic of Moldova a)	0.3446
107	Cape Verde	0.3442
108	Turkmenistan	0.3409
109	Paraguay	0.3408
110	Albania	0.3400
111	Guatemala	0.3391
112	Viet Nam	0.3378
113	Honduras	0.3301
114	Uganda	0.3290
115	Iran (Islamic Republic of)	0.3282
116	Namibia	0.3272
117	Lesotho	0.3250
118	Algeria	0.3248
119	Saint Vincent & St. grenadines a)	0.3239
120	Tunisia	0.3227
121	Nicaragua	0.3216
122	Pakistan	0.3042
123	Myanmar	0.3031
124	Gabon	0.3002
125	Congo	0.2970
126	Kenya	0.2959
127	Oman	0.2884
128	San Marino	0.2882
129	Cambodia	0.2859

130	Zimbabwe	0.2833
131	United Republic of Tanzania	0.2830
132	Nepal	0.2807
133	São Tomé and Principe	0.2774
134	Solomon Islands	0.2700
135	Malawi	0.2697
136	Egypt	0.2653
137	Syrian Arab Republic	0.2644
138	Morocco	0.2641
139	Cameroon	0.2561
140	Rwanda	0.2511
141	Nigeria	0.2485
142	Papua New Guinea	0.2406
143	Ghana	0.2369
144	Lao’s, Peoples Democratic Republic	0.2329
145	Senegal	0.2328
146	Togo	0.2309
147	Sudan	0.2308
148	Madagascar	0.2214
149	Benin	0.2204
150	Mozambique	0.2029
151	Angola	0.1998
152	Monaco	0.1970
153	Djibouti	0.1967
154	Yemen	0.1948
155	Liechtenstein	0.1937
156	D.R. Congo a)	0.1885
157	Comoros	0.1826
158	Burkina Faso	0.1819
159	Bangladesh	0.1788
160	Côte d'Ivoire	0.1729
161	Sierra Leone	0.1720
162	Gambia	0.1710
163	Mauritania	0.1696
164	Vanuatu	0.1618
165	Bhutan	0.1590
166	Burundi	0.1567
167	Andorra	0.1563
168	Guinea	0.1423
169	Chad	0.1399
170	Ethiopia	0.1365
171	Afghanistan a)	0.1337
172	Mali	0.0956
173	Niger	0.0623

174	Timor-Leste	0.0463
175	Micronesia (Federated States of)	0.0456
176	Marshall Islands	0.0447
177	Palau	0.0425
178	Nauru	0.0351
	World average	0.4127

	Table 2 E READINESS INDEX DATA 2004				
	Country	Web measure	Telecom	Human Cap	E Readiness Index 2004
		Index	Index	Index	
	Weight	1/3	1/3	1/3	
1	United States	1.000	0.770	0.970	0.913
2	Denmark	0.934	0.790	0.990	0.905
3	United Kingdom	0.973	0.693	0.990	0.885
4	Sweden	0.772	0.860	0.990	0.874
5	Republic of Korea	0.946	0.666	0.960	0.857
6	Australia	0.830	0.693	0.990	0.838
7	Canada	0.873	0.668	0.970	0.837
8	Singapore	0.969	0.663	0.870	0.834
9	Finland	0.807	0.675	0.990	0.824
10	Norway	0.687	0.776	0.990	0.818
11	Netherlands	0.718	0.700	0.990	0.803
12	Germany	0.795	0.607	0.960	0.787
13	New Zealand	0.741	0.612	0.990	0.781
14	Iceland	0.568	0.782	0.960	0.770
15	Switzerland	0.591	0.721	0.950	0.754
16	Belgium	0.772	0.495	0.990	0.752
17	Austria	0.699	0.577	0.970	0.749
18	Japan	0.629	0.609	0.940	0.726
19	Ireland	0.656	0.501	0.960	0.706
20	Estonia	0.699	0.450	0.960	0.703
21	Malta	0.737	0.456	0.870	0.688
22	Chile	0.884	0.276	0.890	0.684
23	Israel	0.691	0.421	0.930	0.681
24	France	0.541	0.505	0.960	0.669
25	Luxembourg	0.429	0.651	0.900	0.660
26	Italy	0.552	0.497	0.930	0.660
27	Slovenia	0.514	0.498	0.940	0.651
28	Czech Republic	0.548	0.406	0.910	0.621
29	Poland	0.579	0.279	0.950	0.603
30	Mexico	0.784	0.143	0.860	0.596
31	Portugal	0.394	0.422	0.970	0.595
32	Argentina	0.643	0.179	0.940	0.587
33	Hungary	0.537	0.291	0.930	0.586
34	Spain	0.390	0.393	0.970	0.584
35	Brazil	0.637	0.165	0.900	0.567
36	Greece	0.409	0.335	0.930	0.558
37	Slovakia	0.490	0.279	0.900	0.556
38	Romania	0.606	0.165	0.880	0.550
39	Latvia	0.390	0.306	0.950	0.549

40	Uruguay	0.483	0.232	0.930	0.548
41	Bulgaria	0.506	0.209	0.910	0.542
42	Malaysia	0.490	0.302	0.830	0.541
43	Lithuania	0.432	0.238	0.940	0.537
44	Colombia	0.641	0.109	0.850	0.533
45	Ukraine	0.556	0.112	0.930	0.533
46	Bahrain	0.405	0.332	0.860	0.532
47	Philippines	0.591	0.087	0.900	0.526
48	Croatia	0.394	0.294	0.880	0.523
49	Cyprus	0.236	0.421	0.900	0.519
50	Thailand	0.533	0.116	0.880	0.510
51	Mauritius	0.544	0.172	0.800	0.505
52	Russian Federation	0.390	0.185	0.930	0.502
53	Peru	0.517	0.107	0.880	0.501
54	Panama	0.523	0.089	0.860	0.491
55	South Africa	0.515	0.125	0.830	0.490
56	Venezuela	0.517	0.112	0.840	0.490
57	Turkey	0.533	0.165	0.770	0.489
58	Belarus	0.382	0.134	0.950	0.489
59	Jamaica	0.409	0.199	0.830	0.479
60	United Arab Emirates	0.305	0.386	0.730	0.474
61	Trinidad and Tobago	0.328	0.193	0.880	0.467
62	Bahamas	0.299	0.215	0.880	0.465
63	Brunei Darussalam	0.266	0.233	0.890	0.463
64	Saint Lucia	0.326	0.178	0.880	0.462
65	Barbados	0.197	0.212	0.960	0.456
66	Kyrgyzstan	0.394	0.037	0.910	0.447
67	China	0.405	0.111	0.790	0.436
68	Jordan	0.347	0.097	0.860	0.435
69	Kazakhstan	0.320	0.063	0.920	0.434
70	Seychelles	0.162	0.245	0.870	0.426
71	Guyana	0.208	0.124	0.940	0.424
72	Saint Kitts and Nevis	0.116	0.264	0.890	0.423
73	Costa Rica	0.174	0.223	0.860	0.419
74	Lebanon	0.243	0.176	0.830	0.416
75	Mongolia	0.185	0.190	0.870	0.415
76	Belize	0.216	0.149	0.880	0.415
77	Dominican Republic	0.355	0.068	0.810	0.411
78	Maldives	0.243	0.079	0.910	0.411
79	El Salvador	0.394	0.077	0.740	0.403
80	Qatar	0.085	0.297	0.820	0.400
81	Uzbekistan	0.232	0.048	0.910	0.397
82	Ecuador	0.243	0.084	0.850	0.392
83	Armenia	0.251	0.065	0.860	0.392
84	Fiji	0.212	0.081	0.880	0.391
85	Indonesia	0.324	0.048	0.800	0.391
86	India	0.568	0.026	0.570	0.388

87	Serbia and Montenegro	0.336	0.131	0.694	0.387
88	Bolivia	0.255	0.054	0.850	0.386
89	Azerbaijan	0.201	0.077	0.880	0.386
90	Saudi Arabia	0.309	0.139	0.710	0.386
91	Botswana	0.293	0.065	0.790	0.383
92	Samoa	0.216	0.032	0.890	0.379
93	Bosnia and Herzegovina	0.220	0.087	0.830	0.379
94	Georgia	0.147	0.098	0.890	0.378
95	Tonga	0.166	0.048	0.920	0.378
96	Sri Lanka	0.270	0.034	0.820	0.375
97	The former Yugoslav Repub	0.124	0.126	0.860	0.370
98	Dominica	0.069	0.175	0.860	0.368
99	Antigua and Barbuda	0.035	0.252	0.810	0.366
100	Kuwait	0.135	0.230	0.730	0.365
101	Swaziland	0.263	0.041	0.790	0.365
102	Grenada	0.035	0.202	0.840	0.359
103	Iraq	0.124	0.016	0.930	0.357
104	Cuba	0.093	0.051	0.900	0.348
105	Suriname	0.050	0.112	0.880	0.347
106	Republic of Moldova	0.089	0.085	0.860	0.345
107	Cape Verde	0.181	0.081	0.770	0.344
108	Turkmenistan	0.066	0.037	0.920	0.341
109	Paraguay	0.108	0.074	0.840	0.341
110	Albania	0.162	0.058	0.800	0.340
111	Guatemala	0.317	0.051	0.650	0.339
112	Viet Nam	0.143	0.040	0.830	0.338
113	Honduras	0.243	0.037	0.710	0.330
114	Uganda	0.290	0.008	0.690	0.329
115	Iran (Islamic Republic of)	0.162	0.092	0.730	0.328
116	Namibia	0.124	0.058	0.800	0.327
117	Lesotho	0.193	0.012	0.770	0.325
118	Algeria	0.251	0.033	0.690	0.325
119	Saint Vincent and the Grena	0.046	0.135	0.790	0.324
120	Tunisia	0.154	0.084	0.730	0.323
121	Nicaragua	0.274	0.031	0.660	0.322
122	Pakistan	0.475	0.028	0.410	0.304
123	Myanmar	0.185	0.004	0.720	0.303
124	Gabon	0.077	0.073	0.750	0.300
125	Congo	0.151	0.011	0.730	0.297
126	Kenya	0.139	0.019	0.730	0.296
127	Oman	0.050	0.135	0.680	0.288
128	San Marino	0.205	0.660	0.000	0.288
129	Cambodia	0.212	0.005	0.640	0.286
130	Zimbabwe	0.019	0.041	0.790	0.283
131	United Republic of Tanzania	0.228	0.011	0.610	0.283
132	Nepal	0.336	0.006	0.500	0.281
133	Sao Tome and Principe	0.012	0.071	0.750	0.277

134	Solomon Islands	0.108	0.022	0.680	0.270
135	Malawi	0.154	0.005	0.650	0.270
136	Egypt	0.100	0.066	0.630	0.265
137	Syrian Arab Republic	0.050	0.043	0.700	0.264
138	Morocco	0.232	0.061	0.500	0.264
139	Cameroon	0.116	0.012	0.640	0.256
140	Rwanda	0.120	0.004	0.630	0.251
141	Nigeria	0.143	0.013	0.590	0.248
142	Papua New Guinea	0.120	0.032	0.570	0.241
143	Ghana	0.050	0.021	0.640	0.237
144	Lao’s, Peoples Democratic F	0.058	0.011	0.630	0.233
145	Senegal	0.290	0.029	0.380	0.233
146	Togo	0.050	0.033	0.610	0.231
147	Sudan	0.135	0.047	0.510	0.231
148	Madagascar	0.077	0.007	0.580	0.221
149	Benin	0.228	0.013	0.420	0.220
150	Mozambique	0.174	0.005	0.430	0.203
151	Angola	0.212	0.007	0.380	0.200
152	Monaco	0.220	0.371	0.000	0.197
153	Djibouti	0.062	0.018	0.510	0.197
154	Yemen	0.054	0.040	0.490	0.195
155	Liechtenstein	0.208	0.373	0.000	0.194
156	D.R.Congo	0.054	0.002	0.51	0.189
157	Comoros	0.031	0.007	0.510	0.183
158	Burkina Faso	0.292	0.014	0.240	0.182
159	Bangladesh	0.081	0.005	0.450	0.179
160	Côte d'Ivoire	0.039	0.020	0.460	0.173
161	Sierra Leone	0.100	0.006	0.410	0.172
162	Gambia	0.077	0.026	0.410	0.171
163	Mauritania	0.073	0.026	0.410	0.170
164	Vanuatu	0.046	0.029	0.410	0.162
165	Bhutan	0.042	0.014	0.420	0.159
166	Burundi	0.035	0.005	0.430	0.157
167	Andorra	0.174	0.295	0.000	0.156
168	Guinea	0.027	0.010	0.390	0.142
169	Chad	0.008	0.002	0.410	0.140
170	Ethiopia	0.027	0.002	0.380	0.136
171	Afghanistan	0.131	0.002	0.268	0.134
172	Mali	0.012	0.005	0.270	0.096
173	Niger	0.012	0.005	0.170	0.062
174	Timor-Leste	0.139	0.000	0.000	0.046
175	Micronesia (Federated State	0.097	0.040	0.000	0.046
176	Marshall Islands	0.093	0.041	0.000	0.045
177	Palau	0.127	0.000	0.000	0.042
178	Nauru	0.054	0.051	0.000	0.035

	Countries with no web presence				
179	Central African Republic	0.000	0.002	0.400	0.134
180	D.P.R Korea	0.000	0.006	0.000	0.002
181	Equatorial Guinea	0.000	0.025	0.760	0.262
182	Eritrea	0.000	0.008	0.490	0.166
183	Guinea-Bissau	0.000	0.008	0.410	0.139
184	Haiti	0.000	0.012	0.510	0.174
185	Kiribati	0.000	0.026	0.000	0.009
186	Liberia	0.000	0.003	0.000	0.001
187	Libya	0.000	0.052	0.840	0.297
188	Somalia	0.000	0.006	0.096	0.034
189	Tajikistan	0.000	0.041	0.900	0.314
190	Tuvalu	0.000	0.054	0.000	0.018
191	Zambia	0.000	0.019	0.680	0.233
a) = Data for 2000.					

	Table 3 Web measure index 2004	
		Web measure Index
	Country	Sorted
1	Afghanistan	0.131
2	Albania	0.162
3	Algeria	0.251
4	Andorra	0.174
5	Angola	0.212
6	Antigua and Barbuda	0.035
7	Argentina	0.643
8	Armenia	0.251
9	Australia	0.830
10	Austria	0.699
11	Azerbaijan	0.201
12	Bahamas	0.299
13	Bahrain	0.405
14	Bangladesh	0.081
15	Barbados	0.197
16	Belarus	0.382
17	Belgium	0.772
18	Belize	0.216
19	Benin	0.228
20	Bhutan	0.042
21	Bolivia	0.255
22	Bosnia and Herzegovina	0.220
23	Botswana	0.293
24	Brazil	0.637
25	Brunei Darussalam	0.266
26	Bulgaria	0.506
27	Burkina Faso	0.292
28	Burundi	0.035
29	Cambodia	0.212
30	Cameroon	0.116
31	Canada	0.873
32	Cape Verde	0.181
33	Central African Republic	0.000
34	Chad	0.008
35	Chile	0.884
36	China	0.405
37	Colombia	0.641
38	Comoros	0.031
39	Congo	0.151
40	Costa Rica	0.174
41	Côte d'Ivoire	0.039

		Web measure Index
	Country	Sorted
42	Croatia	0.394
43	Cuba	0.093
44	Cyprus	0.236
45	Czech Republic	0.548
46	Democratic People's Republic of Korea	0.000
47	Democratic Republic of the Congo	0.054
48	Denmark	0.934
49	Djibouti	0.062
50	Dominica	0.069
51	Dominican Republic	0.355
52	Ecuador	0.243
53	Egypt	0.100
54	El Salvador	0.394
55	Equatorial Guinea	0.000
56	Eritrea	0.000
57	Estonia	0.699
58	Ethiopia	0.027
59	Fiji	0.212
60	Finland	0.807
61	France	0.541
62	Gabon	0.077
63	Gambia	0.077
64	Georgia	0.147
65	Germany	0.795
66	Ghana	0.050
67	Greece	0.409
68	Grenada	0.035
69	Guatemala	0.317
70	Guinea	0.027
71	Guinea-Bissau	0.000
72	Guyana	0.208
73	Haiti	0.000
74	Honduras	0.243
75	Hungary	0.537
76	Iceland	0.568
77	India	0.568
78	Indonesia	0.324
79	Iran (Islamic Republic of)	0.162
80	Iraq	0.124
81	Ireland	0.656
82	Israel	0.691
83	Italy	0.552

		Web measure Index
	Country	Sorted
84	Jamaica	0.409
85	Japan	0.629
86	Jordan	0.347
87	Kazakhstan	0.320
88	Kenya	0.139
89	Kiribati	0.000
90	Kuwait	0.135
91	Kyrgyzstan	0.394
92	Lao’s, Peoples Democratic Republic	0.058
93	Latvia	0.390
94	Lebanon	0.243
95	Lesotho	0.193
96	Liberia	0.000
97	Libyan Arab Jamahiriya	0.000
98	Liechtenstein	0.208
99	Lithuania	0.432
100	Luxembourg	0.429
101	Madagascar	0.077
102	Malawi	0.154
103	Malaysia	0.490
104	Maldives	0.243
105	Mali	0.012
106	Malta	0.737
107	Marshall Islands	0.093
108	Mauritania	0.073
109	Mauritius	0.544
110	Mexico	0.784
111	Micronesia (Federated States of)	0.097
112	Monaco	0.220
113	Mongolia	0.185
114	Morocco	0.232
115	Mozambique	0.174
116	Myanmar	0.185
117	Namibia	0.124
118	Nauru	0.054
119	Nepal	0.336
120	Netherlands	0.718
121	New Zealand	0.741
122	Nicaragua	0.274
123	Niger	0.012
124	Nigeria	0.143
125	Norway	0.687

		Web measure Index
	Country	Sorted
126	Oman	0.050
127	Pakistan	0.475
128	Palau	0.127
129	Panama	0.523
130	Papua New Guinea	0.120
131	Paraguay	0.108
132	Peru	0.517
133	Philippines	0.591
134	Poland	0.579
135	Portugal	0.394
136	Qatar	0.085
137	Republic of Korea	0.946
138	Republic of Moldova	0.089
139	Romania	0.606
140	Russian Federation	0.390
141	Rwanda	0.120
142	Saint Kitts and Nevis	0.116
143	Saint Lucia	0.326
144	Saint Vincent and the Grenadines	0.046
145	Samoa	0.216
146	San Marino	0.205
147	Sao Tome and Principe	0.012
148	Saudi Arabia	0.309
149	Senegal	0.290
150	Serbia and Montenegro	0.336
151	Seychelles	0.162
152	Sierra Leone	0.100
153	Singapore	0.969
154	Slovakia	0.490
155	Slovenia	0.514
156	Solomon Islands	0.108
157	Somalia	0.000
158	South Africa	0.515
159	Spain	0.390
160	Sri Lanka	0.270
161	Sudan	0.135
162	Suriname	0.050
163	Swaziland	0.263
164	Sweden	0.772
165	Switzerland	0.591
166	Syrian Arab Republic	0.050
167	Tajikistan	0.000

		Web measure Index
	Country	Sorted
168	Thailand	0.533
169	The former Yugoslav Republic of Macedonia	0.124
170	Timor-Leste	0.139
171	Togo	0.050
172	Tonga	0.166
173	Trinidad and Tobago	0.328
174	Tunisia	0.154
175	Turkey	0.533
176	Turkmenistan	0.066
177	Tuvalu	0.000
178	U S A	1.000
179	Uganda	0.290
180	Ukraine	0.556
181	United Arab Emirates	0.305
182	United Kingdom	0.973
183	United Republic of Tanzania	0.228
184	Uruguay	0.483
185	Uzbekistan	0.232
186	Vanuatu	0.046
187	Venezuela	0.517
188	Viet Nam	0.143
189	Yemen	0.054
190	Zambia	0.000
191	Zimbabwe	0.019

Table 4 Telecommunication indicators

	Country	Internet users/1000 persons	Internet users Index	PCs /1000 persons	PC Index	Tel lines	Tel lines Index	online pop	online pop index	Moblie subscr	Mobile Subs Index	TV sets	TV sets Index
1	Afghanistan	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	14.0	0.0
2	Albania	3.9	0.0	11.7	0.0	71.4	0.1	3.4	0.0	276.3	0.3	123.0	0.1
3	Algeria	16.0	0.0	7.7	0.0	61.0	0.1	5.7	0.0	12.8	0.0	114.0	0.1
4	Andorra a)	90.0	0.1	0.0	0.0	438.0	0.4	362.6	0.5	358.0	0.3	440.0	0.5
5	Angola	2.9	0.0	1.9	0.0	6.1	0.0	5.7	0.0	9.3	0.0	19.0	0.0
6	Antigua & Barbuda	128.2	0.2	0.0	0.0	487.8	0.5	75.2	0.1	489.8	0.5	493.0	0.5
7	Argentina	112.0	0.2	82.0	0.1	218.8	0.2	103.8	0.1	177.6	0.2	326.0	0.3
8	Armenia	15.8	0.0	15.8	0.0	142.8	0.1	9.0	0.0	18.9	0.0	230.0	0.2
9	Australia	481.7	0.7	565.1	0.7	538.6	0.5	543.8	0.8	639.8	0.6	731.0	0.8
10	Austria	409.4	0.6	369.3	0.5	488.8	0.5	452.0	0.6	786.2	0.7	542.0	0.6
11	Azerbaijan	36.9	0.1	0.0	0.0	113.5	0.1	3.2	0.0	106.9	0.1	321.0	0.3
12	Bahamas	192.3	0.3	0.0	0.0	405.6	0.4	56.2	0.1	390.3	0.4	243.0	0.3
13	Bahrain	247.5	0.4	160.4	0.2	263.1	0.3	213.6	0.3	583.3	0.6	446.0	0.5
14	Bangladesh	1.5	0.0	3.4	0.0	5.1	0.0	1.1	0.0	8.1	0.0	17.0	0.0
15	Barbados	111.5	0.2	104.1	0.1	494.4	0.5	21.9	0.0	198.0	0.2	290.0	0.3
16	Belarus	81.6	0.1	0.0	0.0	299.4	0.3	40.8	0.1	46.7	0.0	342.0	0.4
17	Belgium	328.3	0.5	241.4	0.3	494.4	0.5	366.2	0.5	785.6	0.7	543.0	0.6
18	Belize	108.9	0.2	127.0	0.2	123.7	0.1	68.4	0.1	204.5	0.2	183.0	0.2
19	Benin	7.4	0.0	2.2	0.0	9.2	0.0	3.7	0.0	32.2	0.0	44.0	0.0
20	Bhutan	14.5	0.0	14.5	0.0	28.4	0.0	0.2	0.0	0.0	0.0	6.0	0.0
21	Bolivia	32.4	0.0	22.8	0.0	67.6	0.1	9.8	0.0	104.6	0.1	121.0	0.1
22	Bosnia & Herzogovina	26.2	0.0	0.0	0.0	236.7	0.2	11.4	0.0	196.3	0.2	111.0	0.1
23	Botswana	29.7	0.0	40.7	0.1	87.2	0.1	7.6	0.0	241.3	0.2	30.0	0.0
24	Brazil	82.2	0.1	74.8	0.1	223.2	0.2	77.7	0.1	200.6	0.2	349.0	0.4
25	Brunei Darussalam	102.3	0.2	76.7	0.1	255.7	0.2	99.7	0.1	400.6	0.4	637.0	0.7
26	Bulgaria	80.8	0.1	51.9	0.1	367.7	0.4	75.9	0.1	333.0	0.3	453.0	0.5
27	Burkina Faso	2.1	0.0	1.6	0.0	5.4	0.0	2.0	0.0	7.5	0.0	103.0	0.1
28	Burundi	1.2	0.0	0.7	0.0	3.2	0.0	0.9	0.0	7.4	0.0	30.0	0.0
29	Cambodia	2.2	0.0	2.0	0.0	2.6	0.0	0.8	0.0	27.6	0.0	8.0	0.0
30	Cameroon	3.8	0.0	5.7	0.0	7.0	0.0	2.8	0.0	42.7	0.0	34.0	0.0
31	Canada	512.8	0.8	487.0	0.6	635.5	0.6	527.9	0.8	377.2	0.4	700.0	0.7
32	Cape Verde	36.4	0.1	79.7	0.1	159.9	0.2	29.4	0.0	97.8	0.1	5.0	0.0
33	Central African	1.3	0.0	2.0	0.0	2.3	0.0	0.5	0.0	3.2	0.0	6.0	0.0
34	Chad	1.9	0.0	1.7	0.0	1.5	0.0	0.4	0.0	4.3	0.0	1.0	0.0
35	Chile	237.5	0.4	119.3	0.2	230.4	0.2	200.2	0.3	428.3	0.4	286.0	0.3
36	China	46.0	0.1	27.6	0.0	166.9	0.2	35.8	0.1	160.9	0.2	312.0	0.3
37	Colombia	46.2	0.1	49.3	0.1	179.4	0.2	28.1	0.0	106.2	0.1	286.0	0.3
38	Comoros	4.2	0.0	5.5	0.0	13.5	0.0	4.1	0.0	0.0	0.0	4.0	0.0
39	Congo	1.5	0.0	3.9	0.0	6.7	0.0	0.2	0.0	67.2	0.1	13.0	0.0
40	Costa Rica	193.1	0.3	197.2	0.3	250.5	0.2	100.1	0.1	111.0	0.1	231.0	0.2
41	Côte d'Ivoire	5.5	0.0	9.3	0.0	20.4	0.0	0.0	0.0	62.3	0.1	60.0	0.1

42	Croatia	180.4	0.3	173.8	0.2	417.2	0.4	110.7	0.2	535.0	0.5	293.0	0.3
43	Cuba	10.7	0.0	31.8	0.0	51.1	0.0	10.7	0.0	1.6	0.0	251.0	0.3
44	Cyprus	293.7	0.5	269.9	0.4	688.0	0.7	195.5	0.3	584.4	0.6	154.0	0.2
45	Czech Republic	256.3	0.4	177.4	0.2	362.3	0.3	262.1	0.4	848.8	0.8	534.0	0.6
46	D.P.R. Korea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.0	0.1
47	D.R. Congo	1.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	10.6	0.0	2.0	0.0
48	Denmark	512.8	0.8	576.8	0.8	688.6	0.7	627.3	0.9	833.2	0.8	857.0	0.9
49	Djibouti	6.9	0.0	15.2	0.0	15.4	0.0	7.0	0.0	22.9	0.0	48.0	0.0
50	Dominica	160.3	0.2	89.7	0.1	303.9	0.3	28.0	0.0	120.0	0.1	232.0	0.2
51	Dominican Rep.	36.4	0.1	0.0	0.0	110.4	0.1	21.3	0.0	206.6	0.2	96.0	0.1
52	Ecuador	41.6	0.1	31.1	0.0	110.2	0.1	24.4	0.0	120.6	0.1	225.0	0.2
53	Egypt	28.2	0.0	16.6	0.0	110.4	0.1	8.5	0.0	66.8	0.1	217.0	0.2
54	El Salvador	46.5	0.1	25.2	0.0	103.4	0.1	6.5	0.0	137.6	0.1	201.0	0.2
55	Equatorial Guinea	3.6	0.0	6.9	0.0	17.4	0.0	2.2	0.0	63.4	0.1	116.0	0.1
56	Eritrea	2.3	0.0	2.5	0.0	9.0	0.0	2.2	0.0	0.0	0.0	39.0	0.0
57	Estonia	327.7	0.5	210.3	0.3	350.6	0.3	347.0	0.5	650.2	0.6	629.0	0.7
58	Ethiopia	0.7	0.0	1.5	0.0	5.3	0.0	0.2	0.0	0.7	0.0	6.0	0.0
59	Fiji	61.0	0.1	48.8	0.1	119.0	0.1	17.5	0.0	109.7	0.1	110.0	0.1
60	Finland	508.9	0.8	441.7	0.6	523.5	0.5	518.9	0.7	867.4	0.8	678.0	0.7
61	France	313.8	0.5	347.1	0.5	568.9	0.5	283.9	0.4	647.0	0.6	632.0	0.7
62	Gabon	19.2	0.0	19.2	0.0	24.7	0.0	12.4	0.0	215.0	0.2	326.0	0.3
63	Gambia	18.8	0.0	14.3	0.0	28.0	0.0	12.4	0.0	72.9	0.1	3.0	0.0
64	Georgia	14.9	0.0	31.6	0.0	131.4	0.1	5.0	0.0	102.1	0.1	474.0	0.5
65	Germany	411.9	0.6	431.3	0.6	650.9	0.6	389.1	0.6	727.5	0.7	586.0	0.6
66	Ghana	7.8	0.0	3.8	0.0	12.7	0.0	2.0	0.0	20.7	0.0	118.0	0.1
67	Greece	154.7	0.2	81.7	0.1	491.3	0.5	131.5	0.2	845.4	0.8	519.0	0.5
68	Grenada	141.5	0.2	132.1	0.2	316.5	0.3	58.3	0.1	71.3	0.1	376.0	0.4
69	Guatemala	33.3	0.1	14.4	0.0	70.5	0.1	15.0	0.0	131.5	0.1	61.0	0.1
70	Guinea	4.6	0.0	5.5	0.0	3.4	0.0	1.9	0.0	11.8	0.0	44.0	0.0
71	Guinea-Bissau	4.0	0.0	0.0	0.0	8.9	0.0	3.0	0.0	0.0	0.0	36.0	0.0
72	Guyana	142.2	0.2	27.3	0.0	91.5	0.1	136.1	0.2	99.3	0.1	70.0	0.1
73	Haiti	9.6	0.0	8.8	0.0	15.7	0.0	4.2	0.0	16.9	0.0	6.0	0.0
74	Honduras	25.2	0.0	13.6	0.0	48.1	0.0	6.4	0.0	48.7	0.0	96.0	0.1
75	Hungary	157.6	0.2	108.4	0.1	361.2	0.3	118.7	0.2	676.0	0.6	445.0	0.5
76	Iceland	647.9	1.0	451.4	0.6	652.8	0.6	698.0	1.0	906.0	0.9	505.0	0.5
77	India	15.9	0.0	7.2	0.0	39.8	0.0	6.7	0.0	12.2	0.0	83.0	0.1
78	Indonesia	37.7	0.1	11.9	0.0	36.5	0.0	19.3	0.0	55.2	0.1	153.0	0.2
79	Iran (Islamic Republic of)	48.5	0.1	75.0	0.1	186.6	0.2	6.3	0.0	33.5	0.0	163.0	0.2
80	Iraq	0.0	0.0	8.0	0.0	28.0	0.0	0.5	0.0	1.0	0.0	83.0	0.1
81	Ireland	270.9	0.4	420.8	0.6	502.4	0.5	337.2	0.5	763.2	0.7	399.0	0.4
82	Israel	301.4	0.5	242.6	0.3	467.2	0.4	171.2	0.2	954.5	0.9	335.0	0.3
83	Italy	352.4	0.5	230.7	0.3	480.7	0.5	333.7	0.5	938.7	0.9	494.0	0.5
84	Jamaica	228.5	0.4	53.7	0.1	169.7	0.2	37.3	0.1	534.8	0.5	194.0	0.2
85	Japan	448.9	0.7	382.2	0.5	558.3	0.5	441.0	0.6	636.5	0.6	731.0	0.8
86	Jordan	57.7	0.1	37.5	0.0	126.6	0.1	39.9	0.1	228.9	0.2	111.0	0.1
87	Kazakhstan	15.7	0.0	0.0	0.0	130.4	0.1	6.0	0.0	64.3	0.1	241.0	0.2

88	Kenya	12.5	0.0	6.4	0.0	10.3	0.0	16.1	0.0	41.5	0.0	26.0	0.0
89	Kiribati	23.0	0.0	11.0	0.0	51.0	0.0	10.9	0.0	6.0	0.0	23.0	0.0
90	Kuwait	105.8	0.2	120.6	0.2	203.8	0.2	94.7	0.1	519.0	0.5	482.0	0.5
91	Kyrgyzstan	29.8	0.0	12.7	0.0	77.5	0.1	11.0	0.0	10.4	0.0	49.0	0.1
92	Lao's, Peoples Democratic	2.7	0.0	3.3	0.0	11.2	0.0	1.7	0.0	10.0	0.0	52.0	0.1
93	Latvia	133.1	0.2	171.7	0.2	301.1	0.3	130.8	0.2	393.8	0.4	840.0	0.9
94	Lebanon	117.1	0.2	80.5	0.1	198.8	0.2	83.8	0.1	227.0	0.2	336.0	0.3
95	Lesotho	9.7	0.0	0.0	0.0	13.2	0.0	2.3	0.0	42.5	0.0	16.0	0.0
96	Liberia	0.0	0.0	0.0	0.0	2.0	0.0	0.1	0.0	1.0	0.0	25.0	0.0
97	Libya	22.5	0.0	23.4	0.0	118.3	0.1	2.4	0.0	12.6	0.0	137.0	0.1
98	Liechtenstein	585.0	0.9	0.0	0.0	583.0	0.6	0.0	0.0	333.0	0.3	469.0	0.5
99	Lithuania	144.4	0.2	109.7	0.1	270.3	0.3	82.3	0.1	475.3	0.4	422.0	0.4
100	Luxembourg	370.0	0.6	594.2	0.8	796.8	0.8	228.6	0.3	1060.5	1.0	599.0	0.6
101	Madagascar	3.5	0.0	4.4	0.0	3.7	0.0	2.1	0.0	10.2	0.0	24.0	0.0
102	Malawi	2.6	0.0	1.3	0.0	7.0	0.0	3.3	0.0	8.2	0.0	4.0	0.0
103	Malaysia	319.7	0.5	146.8	0.2	190.4	0.2	251.5	0.4	376.8	0.4	201.0	0.2
104	Maldives	53.4	0.1	71.2	0.1	102.0	0.1	19.9	0.0	149.1	0.1	38.0	0.0
105	Mali	2.4	0.0	1.4	0.0	5.3	0.0	2.6	0.0	5.0	0.0	17.0	0.0
106	Malta	303.0	0.5	255.1	0.3	523.4	0.5	249.1	0.4	699.1	0.7	549.0	0.6
107	Marshall Islands	23.5	0.0	56.4	0.1	77.4	0.1	12.2	0.0	9.8	0.0	0.0	0.0
108	Mauritania	3.7	0.0	10.8	0.0	11.8	0.0	2.5	0.0	92.2	0.1	95.0	0.1
109	Mauritius	99.1	0.2	116.5	0.2	270.3	0.3	1.3	0.0	289.1	0.3	301.0	0.3
110	Mexico	98.5	0.2	82.0	0.1	146.7	0.1	33.8	0.0	254.5	0.2	283.0	0.3
111	Micronesia (Federated State	51.0	0.1	0.0	0.0	87.0	0.1	15.0	0.0	15.0	0.0	20.0	0.0
112	Mongolia	20.6	0.0	162.0	0.2	1040.0	1.0	0.0	0.0	459.0	0.4	758.0	0.8
113	Monoco	494.0	0.8	28.4	0.0	52.7	0.1	14.8	0.0	88.9	0.1	72.0	0.1
114	Morocco	23.6	0.0	23.6	0.0	38.0	0.0	12.8	0.0	209.1	0.2	159.0	0.2
115	Mozambique	2.7	0.0	4.5	0.0	4.6	0.0	0.8	0.0	14.0	0.0	5.0	0.0
116	Myanmar	0.5	0.0	5.1	0.0	7.0	0.0	0.2	0.0	1.0	0.0	8.0	0.0
117	Namibia	26.7	0.0	70.9	0.1	64.8	0.1	24.7	0.0	80.0	0.1	38.0	0.0
118	Nauru b)	26.0	0.0	0.0	0.0	160.0	0.2	0.0	0.0	130.0	0.1	1.0	0.0
119	Nepal	3.4	0.0	3.7	0.0	14.1	0.0	2.3	0.0	0.9	0.0	8.0	0.0
120	Netherlands	506.3	0.8	466.6	0.6	617.7	0.6	608.3	0.9	744.7	0.7	553.0	0.6
121	New Zealand	484.4	0.7	413.8	0.5	448.1	0.4	527.0	0.8	621.7	0.6	557.0	0.6
122	Nicaragua	16.8	0.0	27.9	0.0	32.0	0.0	4.2	0.0	37.8	0.0	69.0	0.1
123	Niger	1.3	0.0	0.6	0.0	1.9	0.0	1.1	0.0	1.4	0.0	37.0	0.0
124	Nigeria	3.5	0.0	7.1	0.0	5.8	0.0	0.8	0.0	13.4	0.0	68.0	0.1
125	Norway	502.6	0.8	528.3	0.7	734.4	0.7	592.0	0.8	843.6	0.8	883.0	0.9
126	Oman	70.9	0.1	37.4	0.0	83.9	0.1	44.2	0.1	171.5	0.2	563.0	0.6
127	Pakistan	10.3	0.0	4.2	0.0	25.0	0.0	8.5	0.0	8.5	0.0	148.0	0.2
128	Palau	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
129	Panama	41.4	0.1	38.3	0.1	122.0	0.1	16.0	0.0	189.5	0.2	194.0	0.2
130	Papua New Guinea	13.7	0.0	58.7	0.1	11.7	0.0	27.4	0.0	2.7	0.0	19.0	0.0
131	Paraguay	17.3	0.0	34.6	0.0	47.3	0.0	3.6	0.0	288.3	0.3	218.0	0.2
132	Peru	93.5	0.1	43.0	0.1	66.0	0.1	107.3	0.2	86.2	0.1	148.0	0.2
133	Philippines	44.0	0.1	27.7	0.0	41.7	0.0	77.7	0.1	191.3	0.2	173.0	0.2

134	Poland	230.0	0.4	105.6	0.1	295.1	0.3	165.7	0.2	362.6	0.3	401.0	0.4
135	Portugal	193.5	0.3	134.9	0.2	421.3	0.4	436.0	0.6	825.2	0.8	415.0	0.4
136	Qatar	113.4	0.2	178.2	0.2	289.4	0.3	97.5	0.1	438.0	0.4	866.0	0.9
137	Rep. of Korea	551.9	0.9	555.8	0.7	488.6	0.5	538.0	0.8	679.5	0.6	363.0	0.4
138	Rep. of Moldova	34.1	0.1	17.5	0.0	160.7	0.2	3.4	0.0	76.9	0.1	296.0	0.3
139	Romania	101.5	0.2	83.0	0.1	194.4	0.2	44.8	0.1	235.7	0.2	379.0	0.4
140	Russian Federation	40.9	0.1	88.7	0.1	242.2	0.2	124.2	0.2	120.1	0.1	538.0	0.6
141	Rwanda	3.1	0.0	0.0	0.0	2.8	0.0	2.7	0.0	13.6	0.0	0.0	0.0
142	Saint Kitts and Nevis	212.8	0.3	191.5	0.3	500.0	0.5	51.5	0.1	106.4	0.1	256.0	0.3
143	Saint Lucia	82.4	0.1	150.0	0.2	319.5	0.3	19.2	0.0	89.5	0.1	368.0	0.4
144	Saint Vincent & the Grenadi	59.8	0.1	119.7	0.2	233.5	0.2	30.3	0.0	85.3	0.1	230.0	0.2
145	Samoa	22.2	0.0	6.7	0.0	56.9	0.1	16.8	0.0	15.0	0.0	56.0	0.1
146	San Marino	531.0	0.8	760.0	1.0	763.0	0.7	0.0	0.0	621.0	0.6	875.0	0.9
147	Sao Tomé & Principe	72.8	0.1	0.0	0.0	41.3	0.0	52.8	0.1	13.1	0.0	229.0	0.2
148	Saudi Arabia	64.6	0.1	136.7	0.2	143.9	0.1	25.0	0.0	217.2	0.2	264.0	0.3
149	Senegal	10.4	0.0	19.8	0.0	22.3	0.0	9.4	0.0	54.9	0.1	79.0	0.1
150	Serbia and Montenegro	59.7	0.1	27.1	0.0	232.6	0.2	28.1	0.0	256.6	0.2	277.0	0.3
151	Seychelles	145.2	0.2	160.8	0.2	269.1	0.3	112.4	0.2	553.5	0.5	214.0	0.2
152	Sierra Leone	1.6	0.0	2.1	0.0	4.8	0.0	3.8	0.0	13.4	0.0	13.0	0.0
153	Singapore	504.4	0.8	622.0	0.8	462.9	0.4	518.4	0.7	795.6	0.8	300.0	0.3
154	Slovakia	160.4	0.2	180.4	0.2	268.2	0.3	129.4	0.2	543.6	0.5	407.0	0.4
155	Slovenia	375.8	0.6	300.6	0.4	506.1	0.5	311.3	0.4	835.3	0.8	367.0	0.4
156	Solomon Islands	5.0	0.0	40.5	0.1	14.9	0.0	17.0	0.0	2.2	0.0	16.0	0.0
157	Somalia	9.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	3.0	0.0	14.0	0.0
158	South Africa	68.2	0.1	72.6	0.1	106.6	0.1	70.3	0.1	303.9	0.3	152.0	0.2
159	Spain	156.3	0.2	196.0	0.3	506.2	0.5	196.9	0.3	824.2	0.8	598.0	0.6
160	Sri Lanka	10.6	0.0	13.2	0.0	46.6	0.0	6.3	0.0	49.2	0.0	117.0	0.1
161	Sudan	2.6	0.0	6.1	0.0	20.6	0.0	1.5	0.0	5.9	0.0	386.0	0.4
162	Suriname	41.6	0.1	45.5	0.1	163.5	0.2	33.2	0.0	225.2	0.2	241.0	0.2
163	Swaziland	19.4	0.0	24.2	0.0	34.0	0.0	12.5	0.0	61.0	0.1	128.0	0.1
164	Sweden	573.1	0.9	621.3	0.8	735.7	0.7	678.1	1.0	888.9	0.8	965.0	1.0
165	Switzerland	351.0	0.5	708.7	0.9	744.2	0.7	527.0	0.8	789.3	0.7	554.0	0.6
166	Syrian Arab Republic	12.9	0.0	19.4	0.0	123.2	0.1	3.5	0.0	23.5	0.0	67.0	0.1
167	Tajikistan	0.5	0.0	0.0	0.0	37.3	0.0	0.3	0.0	2.1	0.0	326.0	0.3
168	Thailand	77.6	0.1	39.8	0.1	105.0	0.1	19.6	0.0	260.4	0.2	300.0	0.3
169	The former Yugoslav Repub	48.5	0.1	0.0	0.0	271.3	0.3	49.0	0.1	177.0	0.2	273.0	0.3
170	Timor-Leste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
171	Togo	41.0	0.1	30.8	0.0	10.5	0.0	9.5	0.0	34.9	0.0	37.0	0.0
172	Tonga	29.2	0.0	20.2	0.0	112.9	0.1	9.8	0.0	33.8	0.0	61.0	0.1
173	Trinidad & Tobago	106.0	0.2	79.5	0.1	249.8	0.2	103.1	0.1	278.1	0.3	340.0	0.4
174	Tunisia	51.7	0.1	30.7	0.0	117.4	0.1	40.8	0.1	51.5	0.0	198.0	0.2
175	Turkey	72.8	0.1	44.6	0.1	281.2	0.3	37.1	0.1	347.5	0.3	319.0	0.3
176	Turkmenistan	1.7	0.0	4.6	0.0	77.1	0.1	0.4	0.0	1.7	0.0	196.0	0.2
177	Tuvalu	131.0	0.2	0.0	0.0	68.0	0.1	0.0	0.0	0.0	0.0	9.0	0.0
178	Uganda	4.0	0.0	3.3	0.0	2.2	0.0	2.4	0.0	15.9	0.0	27.0	0.0
179	Ukraine	18.0	0.0	19.0	0.0	216.1	0.2	15.4	0.0	83.8	0.1	456.0	0.5

180	United Arab Emirates	313.2	0.5	119.9	0.2	313.5	0.3	367.9	0.5	696.1	0.7	252.0	0.3
181	United Kingdom & N. Irelan	423.1	0.7	405.7	0.5	590.6	0.6	572.4	0.8	840.7	0.8	950.0	1.0
182	United Republic of Tanzania	2.3	0.0	4.2	0.0	4.7	0.0	8.1	0.0	19.5	0.0	42.0	0.0
183	United States	551.4	0.9	658.9	0.9	645.8	0.6	591.0	0.8	488.1	0.5	835.0	0.9
184	Uruguay	119.0	0.2	110.1	0.1	279.6	0.3	136.1	0.2	192.6	0.2	530.0	0.5
185	Uzbekistan	10.9	0.0	2.9	0.0	66.5	0.1	5.9	0.0	7.4	0.0	276.0	0.3
186	Vanuatu	34.6	0.1	14.8	0.0	32.7	0.0	15.8	0.0	24.2	0.0	12.0	0.0
187	Venezuela	50.6	0.1	60.9	0.1	112.7	0.1	53.5	0.1	256.4	0.2	185.0	0.2
188	Viet Nam	18.5	0.0	9.8	0.0	48.4	0.0	4.9	0.0	23.4	0.0	186.0	0.2
189	Yemen	5.1	0.0	7.4	0.0	27.8	0.0	0.9	0.0	21.1	0.0	283.0	0.3
190	Zambia	4.8	0.0	7.4	0.0	8.2	0.0	2.5	0.0	13.0	0.0	113.0	0.1
191	Zimbabwe	43.0	0.1	51.6	0.1	24.7	0.0	8.8	0.0	30.3	0.0	35.0	0.0

Sources: For Internet: International Telecommunication Union, http://www.itu.int/ITU-D/ict/statistics/at_glance/Internet02.pdf
and UN Department of Economic and Social Affairs (UNDESA)
http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp?
HYrID=2002&HYrID=2001&HYrID=2000&HCrID=all&HSrID=29969&continue=Continue+%3E%3E
a) =Data is for 2000,
b) = Data for 2001.
Sources For PCs: International Telecommunication Union,
http://www.itu.int/ITU-D/ict/statistics/at_glance/Internet02.pdf
and UN Department of Economic and Social Affairs (UNDESA).
http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp?
HYrID=2002&HYrID=2001&HYrID=2000&HCrID=all&HSrID=29971&continue=Continue+%3E%3E
Sources: For Telephone lines: International Telecommunication Union,
http://www.itu.int/ITU-D/ict/statistics/at_glance/main02.pdf
and Department of Economic and Social Affairs (UNDESA).
http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp?
HYrID=2002&HYrID=2001&HYrID=2000&HCrID=all&HSrID=13130&continue=Continue+%3E%3E
Sources: For online population: Data is the latest available year during the period 1999-2002, NUA Internet Surveys
http://www.nua.com/surveys/how_many_online/
Definition: 'How Many Online' figures represent both adults and children who have accessed the
Internet at least once during the 3 months prior to being surveyed. Where these figures are not available,
figures are for for users who have gone online in the past 6 months, past year, or ever.
Sources: For mobile subscribers: http://www.itu.int/ITU-D/ict/statistics/at_glance/cellular02.pdf
and UN Department of Economic and Social Affairs (UNDESA).
http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp?
HYrID=2002&HYrID=2001&HYrID=2000&HCrID=all&HSrID=13110&continue=Continue+%3E%3E
Source: UN Department of Economic and Social Affairs (UNDESA).
http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract_fm.asp?
HYrID=1999&HYrID=1998&HYrID=1997&HCrID=all&HSrID=25720&continue=Continue+%3E%3E
and World Bank http://www.worldbank.org/data/wdi2003/pdfs/table%205-11.pdf

Table 5 Infrastructure Index 2004

	Country	Telecom Infr Index
1	Afghanistan	0.002
2	Albania	0.058
3	Algeria	0.033
4	Andorra	0.295
5	Angola	0.007
6	Antigua & Barbuda	0.252
7	Argentina	0.179
8	Armenia	0.065
9	Australia	0.693
10	Austria	0.577
11	Azerbaijan	0.077
12	Bahamas	0.215
13	Bahrain	0.332
14	Bangladesh	0.005
15	Barbados	0.212
16	Belarus	0.134
17	Belgium	0.495
18	Belize	0.149
19	Benin	0.013
20	Bhutan	0.014
21	Bolivia	0.054
22	Bosnia & Herzogovina	0.087
23	Botswana	0.065
24	Brazil	0.165
25	Brunei Darussalam	0.233
26	Bulgaria	0.209
27	Burkina Faso	0.014
28	Burundi	0.005
29	Cambodia	0.005
30	Cameroon	0.012
31	Canada	0.668
32	Cape Verde	0.081
33	Central African	0.002
34	Chad	0.002
35	Chile	0.276
36	China	0.111
37	Colombia	0.109
38	Comoros	0.007
39	Congo	0.011
40	Costa Rica	0.223
41	Côte d'Ivoire	0.020
42	Croatia	0.294
43	Cuba	0.051

44	Cyprus	0.421
45	Czech Republic	0.406
46	D.P.R Korea	0.006
47	D.R.Congo	0.002
48	Denmark	0.790
49	Djibouti	0.018
50	Dominica	0.175
51	Dominican Rep.	0.068
52	Ecuador	0.084
53	Egypt	0.066
54	El Salvador	0.077
55	Equatorial Guinea	0.025
56	Eritrea	0.008
57	Estonia	0.450
58	Ethiopia	0.002
59	Fiji	0.081
60	Finland	0.675
61	France	0.505
62	Gabon	0.073
63	Gambia	0.026
64	Georgia	0.098
65	Germany	0.607
66	Ghana	0.021
67	Greece	0.335
68	Grenada	0.202
69	Guatemala	0.051
70	Guinea	0.010
71	Guinea-Bissau	0.008
72	Guyana	0.124
73	Haiti	0.012
74	Honduras	0.037
75	Hungary	0.291
76	Iceland	0.782
77	India	0.026
78	Indonesia	0.048
79	Iran (I.R.)	0.092
80	Iraq	0.016
81	Ireland	0.501
82	Israel	0.421
83	Italy	0.497
84	Jamaica	0.199
85	Japan	0.609
86	Jordan	0.097
87	Kazakhstan	0.063
88	Kenya	0.019
89	Kiribati	0.026
90	Kuwait	0.230
91	Kyrgyzstan	0.037

92	Lao P.D.R.	0.011
93	Latvia	0.306
94	Lebanon	0.176
95	Lesotho	0.012
96	Liberia	0.003
97	Libya	0.052
98	Liechtenstein	0.373
99	Lithuania	0.238
100	Luxembourg	0.651
101	Madagascar	0.007
102	Malawi	0.005
103	Malaysia	0.302
104	Maldives	0.079
105	Mali	0.005
106	Malta	0.456
107	Marshall Islands	0.041
108	Mauritania	0.026
109	Mauritius	0.172
110	Mexico	0.143
111	Micronesia	0.040
112	Monaco	0.371
113	Mongolia	0.190
114	Morocco	0.061
115	Mozambique	0.005
116	Myanmar	0.004
117	Namibia	0.058
118	Nauru	0.051
119	Nepal	0.006
120	Netherlands	0.700
121	New Zealand	0.612
122	Nicaragua	0.031
123	Niger	0.005
124	Nigeria	0.013
125	Norway	0.776
126	Oman	0.135
127	Pakistan	0.028
128	Palau	0.000
129	Panama	0.089
130	Papua New Guinea	0.032
131	Paraguay	0.074
132	Peru	0.107
133	Philippines	0.087
134	Poland	0.279
135	Portugal	0.422
136	Qatar	0.297
137	Rep. of Korea	0.666
138	Rep. of Moldova	0.085
139	Romania	0.165

140	Russian Federation	0.185
141	Rwanda	0.004
142	Saint Kitts and Nevis	0.264
143	Saint Lucia	0.178
144	Saint Vincent & the Grenadines	0.135
145	Samoa	0.032
146	San Marino	0.660
147	Sao Tomé & Principe	0.071
148	Saudi Arabia	0.139
149	Senegal	0.029
150	Serbia and Montenegro	0.131
151	Seychelles	0.245
152	Sierra Leone	0.006
153	Singapore	0.663
154	Slovakia	0.279
155	Slovenia	0.498
156	Solomon Islands	0.022
157	Somalia	0.006
158	South Africa	0.125
159	Spain	0.393
160	Sri Lanka	0.034
161	Sudan	0.047
162	Suriname	0.112
163	Swaziland	0.041
164	Sweden	0.860
165	Switzerland	0.721
166	Syria	0.043
167	Tajikistan	0.041
168	Thailand	0.116
169	The former Yugoslav Republic of Macedonia	0.126
170	Timor-Leste	0.000
171	Togo	0.033
172	Tonga	0.048
173	Trinidad & Tobago	0.193
174	Tunisia	0.084
175	Turkey	0.165
176	Turkmenistan	0.037
177	Tuvalu	0.054
178	Uganda	0.008
179	Ukraine	0.112
180	United Arab Emirates	0.386
181	United Kingdom & N. Ireland	0.693
182	United Rep. of Tanzania	0.011
183	United States	0.770
184	Uruguay	0.232
185	Uzbekistan	0.048
186	Vanuatu	0.029
187	Venezuela	0.112

188	Viet Nam	0.040
189	Yemen	0.040
190	Zambia	0.019
191	Zimbabwe	0.041

Table 6 Human Capital Index 2004

1	Afghanistan a)	0.268
2	Albania	0.800
3	Algeria	0.690
4	Andorra	0.000
5	Angola	0.380
6	Antigua and Barbuda	0.810
7	Argentina	0.940
8	Armenia	0.860
9	Australia	0.990
10	Austria	0.970
11	Azerbaijan	0.880
12	Bahamas	0.880
13	Bahrain	0.860
14	Bangladesh	0.450
15	Barbados	0.960
16	Belarus	0.950
17	Belgium	0.990
18	Belize	0.880
19	Benin	0.420
20	Bhutan	0.420
21	Bolivia	0.850
22	Bosnia and Herzegovina	0.830
23	Botswana	0.790
24	Brazil	0.900
25	Brunei Darussalam	0.890
26	Bulgaria	0.910
27	Burkina Faso	0.240
28	Burundi	0.430
29	Cambodia	0.640
30	Cameroon	0.640
31	Canada	0.970
32	Cape Verde	0.770
33	Central African Republic	0.400
34	Chad	0.410
35	Chile	0.890
36	China	0.790
37	Colombia	0.850
38	Comoros	0.510
39	Congo	0.730
40	Costa Rica	0.860
41	Côte d'Ivoire	0.460

42	Croatia	0.880
43	Cuba	0.900
44	Cyprus	0.900
45	Czech Republic	0.910
46	D.R. Congo a)	0.51
47	D.R.P.R. Korea	0.000
48	Denmark	0.990
49	Djibouti	0.510
50	Dominica	0.860
51	Dominican Republic	0.810
52	Ecuador	0.850
53	Egypt	0.630
54	El Salvador	0.740
55	Equatorial Guinea	0.760
56	Eritrea	0.490
57	Estonia	0.960
58	Ethiopia	0.380
59	Fiji	0.880
60	Finland	0.990
61	France	0.960
62	Gabon	0.750
63	Gambia	0.410
64	Georgia	0.890
65	Germany	0.960
66	Ghana	0.640
67	Greece	0.930
68	Grenada	0.840
69	Guatemala	0.650
70	Guinea	0.390
71	Guinea-Bissau	0.410
72	Guyana	0.940
73	Haiti	0.510
74	Honduras	0.710
75	Hungary	0.930
76	Iceland	0.960
77	India	0.570
78	Indonesia	0.800
79	Iran (Islamic Republic of)	0.730
80	Iraq a)	0.930
81	Ireland	0.960
82	Israel	0.930
83	Italy	0.930
84	Jamaica	0.830
85	Japan	0.940

86	Jordan	0.860
87	Kazakhstan	0.920
88	Kenya	0.730
89	Kiribati	0.000
90	Kuwait	0.730
91	Kyrgyzstan	0.910
92	Lao’s, Peoples Democratic Republic	0.630
93	Latvia	0.950
94	Lebanon	0.830
95	Lesotho	0.770
96	Liberia	0.000
97	Libya	0.840
98	Liechtenstein	0.000
99	Lithuania	0.940
100	Luxembourg	0.900
101	Madagascar	0.580
102	Malawi	0.650
103	Malaysia	0.830
104	Maldives	0.910
105	Mali	0.270
106	Malta	0.870
107	Marshall Islands	0.000
108	Mauritania	0.410
109	Mauritius	0.800
110	Mexico	0.860
111	Micronesia (Federated States of)	0.000
112	Monaco	0.000
113	Mongolia	0.870
114	Morocco	0.500
115	Mozambique	0.430
116	Myanmar	0.720
117	Namibia	0.800
118	Nauru	0.000
119	Nepal	0.500
120	Netherlands	0.990
121	New Zealand	0.990
122	Nicaragua	0.660
123	Niger	0.170
124	Nigeria	0.590
125	Norway	0.990
126	Oman	0.680
127	Pakistan	0.410
128	Palau	0.000
129	Panama	0.860

130	Papua New Guinea	0.570
131	Paraguay	0.840
132	Peru	0.880
133	Philippines	0.900
134	Poland	0.950
135	Portugal	0.970
136	Qatar	0.820
137	Republic of Moldova a)	0.860
138	Republic of Korea	0.960
139	Romania	0.880
140	Russian Federation	0.930
141	Rwanda	0.630
142	Saint Kitts and Nevis	0.890
143	Saint Lucia	0.880
144	Saint Vincent & St. grenadines a)	0.790
145	Samoa	0.890
146	San Marino	0.000
147	São Tomé and Principe	0.750
148	Saudi Arabia	0.710
149	Senegal	0.380
150	Serbia & Montenegro a)	0.694
151	Seychelles	0.870
152	Sierra Leone	0.410
153	Singapore	0.870
154	Slovakia	0.900
155	Slovenia	0.940
156	Solomon Islands	0.680
157	Somalia a)	0.096
158	South Africa	0.830
159	Spain	0.970
160	Sri Lanka	0.820
161	Sudan	0.510
162	Suriname	0.880
163	Swaziland	0.790
164	Sweden	0.990
165	Switzerland	0.950
166	Syrian Arab Republic	0.700
167	Tajikistan	0.900
168	Thailand	0.880
169	Timor-Leste	0.000
170	Togo	0.610
171	Tonga a)	0.920
172	Trinidad and Tobago	0.880
173	Tunisia	0.730

174	Turkey	0.770
175	Turkmenistan	0.920
176	Tuvalu	0.000
177	The former Yugoslav Republic of Macedonia	0.860
178	Uganda	0.690
179	Ukraine	0.930
180	United Arab Emirates	0.730
181	United Kingdom	0.990
182	United Republic of Tanzania	0.610
183	United States	0.970
184	Uruguay	0.930
185	Uzbekistan	0.910
186	Vanuatu	0.410
187	Venezuela	0.840
188	Viet Nam	0.830
189	Yemen	0.490
190	Zambia	0.680
191	Zimbabwe	0.790

Note: All data for 2001 unless otherwise noted.
a) = Data for 2000
Source: UNDP. Human Development Report 2003.
http://hdr.undp.org/reports/global/2003/indicator/index_indicators.html
and the United Nations World Public Sector Report 2003
: E-Government at the Crossroads. Pps. 222-224.

Table 7 Score by Stages

		percent utilization					
		I	**II**	**III**	**IV**	**V**	**Total**
	High range 67 - 100 %						
1	United States	100.0	100.0	100.0	92.7	77.8	94.5
2	United Kingdom	100.0	97.7	94.0	92.7	77.8	92.0
3	Singapore	100.0	95.4	98.8	85.4	77.8	91.6
4	Republic of Korea	100.0	100.0	100.0	70.7	68.5	89.4
5	Denmark	100.0	95.4	95.2	80.5	70.4	88.3
6	Chile	100.0	94.3	89.3	70.7	64.8	83.6
7	Canada	100.0	98.9	86.9	56.1	66.7	82.5
8	Australia	100.0	93.1	91.7	61.0	44.4	78.5
9	Finland	100.0	93.1	94.0	56.1	33.3	76.3
10	Germany	100.0	90.8	92.9	56.1	33.3	75.2
11	Mexico	100.0	89.7	83.3	41.5	55.6	74.1
12	Belgium	100.0	89.7	81.0	41.5	53.7	73.0
13	Sweden	100.0	100.0	79.8	26.8	50.0	73.0
14	New Zealand	100.0	89.7	82.1	31.7	44.4	70.1
15	Malta	100.0	96.6	84.5	29.3	29.6	69.7
16	Netherlands	100.0	93.1	71.4	26.8	48.1	67.9
	Mid range 34-66 %						
17	Austria	87.5	94.3	77.4	29.3	27.8	66.1
18	Estonia	100.0	87.4	84.5	26.8	27.8	66.1
19	Israel	100.0	92.0	75.0	39.0	22.2	65.3
20	Norway	100.0	97.7	71.4	19.5	31.5	65.0
21	Argentina	100.0	89.7	74.4	29.3	24.1	63.3
22	Ireland	100.0	86.2	75.0	41.5	13.0	62.0
23	Colombia	100.0	79.3	77.4	19.5	29.6	60.6
24	Brazil	100.0	85.1	69.0	43.9	13.0	60.2
25	Japan	100.0	92.0	64.3	26.8	18.5	59.5
26	Romania	100.0	83.9	81.0	7.3	9.3	57.3
27	Philippines	100.0	73.6	70.2	26.8	20.4	55.8
28	Switzerland	87.5	86.2	64.3	12.2	22.2	55.8
29	Poland	100.0	86.2	60.7	0.0	29.6	54.7
30	Iceland	87.5	92.0	61.9	0.0	14.8	53.6
31	India	100.0	73.6	70.2	17.1	16.7	53.6
32	Ukraine	100.0	88.5	56.0	0.0	22.2	52.6
33	Italy	100.0	93.1	47.6	9.8	18.5	52.2
34	Czech Republic	75.0	85.1	56.0	4.9	24.1	51.8
35	Mauritius	100.0	73.6	69.0	17.1	7.4	51.5
36	France	100.0	90.8	40.5	14.6	24.1	51.1

37	Hungary	100.0	72.4	54.8	0.0	40.7	50.7
38	Thailand	87.5	79.3	50.0	0.0	37.0	50.4
39	Turkey	87.5	79.3	59.5	0.0	22.2	50.4
40	Panama	100.0	64.4	62.5	24.4	16.7	49.5
41	Peru	100.0	77.0	56.0	2.4	20.4	48.9
42	Venezuela	100.0	77.0	56.0	2.4	20.4	48.9
43	South Africa	100.0	80.5	55.4	0.0	16.7	48.7
44	Slovenia	100.0	81.6	57.1	0.0	11.1	48.5
45	Bulgaria	87.5	77.0	51.2	0.0	25.9	47.8
46	Malaysia	100.0	67.8	53.6	17.1	14.8	46.4
47	Slovakia	100.0	74.7	56.0	0.0	13.0	46.4
48	Uruguay	100.0	63.2	61.9	17.1	5.6	45.6
49	Pakistan	100.0	74.7	52.4	0.0	11.1	44.9
50	Lithuania	87.5	77.0	42.9	0.0	3.7	40.9
51	Luxembourg	100.0	69.0	42.9	0.0	13.0	40.5
52	Greece	0.0	71.3	42.9	7.3	9.3	38.7
53	Jamaica	100.0	51.7	56.0	0.0	11.1	38.7
54	Bahrain	87.5	67.8	36.9	0.0	14.8	38.3
55	China	75.0	65.5	46.4	0.0	5.6	38.3
56	Croatia	100.0	56.3	41.7	0.0	18.5	37.2
57	El Salvador	87.5	55.2	45.2	0.0	16.7	37.2
58	Kyrgyzstan	100.0	64.4	34.5	2.4	14.8	37.2
59	Portugal	87.5	67.8	36.9	0.0	9.3	37.2
60	Latvia	87.5	62.1	39.3	0.0	13.0	36.9
61	Russian Federation	100.0	57.5	39.3	0.0	18.5	36.9
62	Spain	100.0	69.0	39.3	0.0	0.0	36.9
63	Belarus	62.5	59.8	34.5	0.0	24.1	36.1
64	Dominican Republic	75.0	63.2	32.1	0.0	7.4	33.6
		Low range 0 - 33 %					
65	Jordan	87.5	49.4	46.4	0.0	1.9	32.8
66	Nepal	100.0	35.6	51.2	0.0	9.3	31.8
67	Serbia and Montenegro	87.5	52.9	39.3	0.0	1.9	31.8
68	Trinidad and Tobago	87.5	48.3	38.1	0.0	7.4	31.0
69	Saint Lucia	100.0	39.1	47.0	0.0	5.6	30.8
70	Indonesia	100.0	52.9	19.0	0.0	25.9	30.7
71	Kazakhstan	12.5	57.5	32.1	0.0	9.3	30.3
72	Guatemala	100.0	46.0	31.0	14.6	3.7	29.9
73	Saudi Arabia	0.0	55.2	31.0	0.0	11.1	29.2
74	United Arab Emirates	75.0	33.3	33.3	31.7	5.6	28.8
75	Bahamas	100.0	34.5	47.0	0.0	0.0	28.3
76	Botswana	75.0	34.5	46.4	0.0	1.9	27.7
77	Burkina Faso	100.0	51.7	23.2	0.0	5.6	27.6
78	Senegal	100.0	47.1	25.0	0.0	9.3	27.4
79	Uganda	100.0	43.7	32.1	0.0	3.7	27.4

80	Nicaragua	87.5	47.1	20.2	0.0	11.1	25.9
81	Sri Lanka	100.0	36.8	29.8	7.3	3.7	25.5
82	Brunei Darussalam	87.5	41.4	25.0	0.0	9.3	25.2
83	Swaziland	75.0	37.9	32.1	0.0	3.7	24.8
84	Bolivia	75.0	59.8	7.1	0.0	3.7	24.1
85	Algeria	75.0	35.6	29.8	0.0	5.6	23.7
86	Armenia	100.0	35.6	29.8	0.0	1.9	23.7
87	Ecuador	75.0	46.0	15.5	0.0	7.4	23.0
88	Honduras	37.5	41.4	20.2	0.0	13.0	23.0
89	Lebanon	87.5	40.2	19.0	0.0	9.3	23.0
90	Maldives	87.5	40.2	21.4	0.0	5.6	23.0
91	Cyprus	75.0	39.1	22.6	0.0	3.7	22.3
92	Morocco	100.0	37.9	17.9	0.0	7.4	21.9
93	Uzbekistan	87.5	19.5	42.9	0.0	0.0	21.9
94	Benin	87.5	23.0	35.7	2.4	1.9	21.5
95	United Republic of Tanzania	100.0	21.8	38.1	0.0	0.0	21.5
96	Bosnia and Herzegovina	87.5	31.0	27.4	0.0	0.0	20.8
97	Monaco	62.5	28.7	29.8	0.0	3.7	20.8
98	Belize	87.5	12.6	44.0	0.0	1.9	20.4
99	Samoa	87.5	20.7	36.9	0.0	0.0	20.4
100	Angola	75.0	29.9	25.0	2.4	1.9	20.1
101	Cambodia	100.0	25.3	25.0	0.0	7.4	20.1
102	Fiji	87.5	19.5	35.7	0.0	1.9	20.1
103	Guyana	62.5	19.5	34.5	0.0	5.6	19.7
104	Liechtenstein	100.0	28.7	23.8	0.0	1.9	19.7
105	San Marino	50.0	23.0	34.5	0.0	0.0	19.3
106	Azerbaijan	0.0	35.6	23.8	0.0	1.9	19.0
107	Barbados	87.5	26.4	17.9	9.8	3.7	18.6
108	Lesotho	100.0	13.8	34.5	0.0	1.9	18.2
109	Mongolia	87.5	27.6	13.1	0.0	11.1	17.5
110	Myanmar	100.0	17.2	22.6	7.3	5.6	17.5
111	Cape Verde	62.5	36.8	9.5	0.0	3.7	17.2
112	Andorra	75.0	32.2	9.5	0.0	5.6	16.4
113	Costa Rica	75.0	33.3	10.7	0.0	1.9	16.4
114	Mozambique	75.0	26.4	16.7	0.0	3.7	16.4
115	Tonga	75.0	8.0	35.7	0.0	0.0	15.7
116	Albania	0.0	28.7	16.7	0.0	5.6	15.3
117	Iran (Islamic Republic of)	62.5	24.1	17.9	0.0	1.9	15.3
118	Seychelles	75.0	12.6	26.2	0.0	5.6	15.3
119	Malawi	75.0	10.3	28.6	0.0	1.9	14.6
120	Tunisia	87.5	3.4	35.7	0.0	0.0	14.6
121	Congo	100.0	10.3	23.8	0.0	3.7	14.2
122	Georgia	87.5	26.4	9.5	0.0	0.0	13.9
123	Nigeria	87.5	12.6	20.2	0.0	3.7	13.5

124	Viet Nam	87.5	24.1	8.3	0.0	3.7	13.5
125	Kenya	75.0	8.0	25.0	0.0	3.7	13.1
126	Timor-Leste	100.0	16.1	15.5	0.0	1.9	13.1
127	Kuwait	0.0	26.4	11.9	0.0	3.7	12.8
128	Sudan	62.5	18.4	13.1	0.0	5.6	12.8
129	Afghanistan	37.5	20.7	13.1	0.0	3.7	12.4
130	Palau	50.0	12.6	21.4	0.0	0.0	12.0
131	Iraq	37.5	13.8	16.7	2.4	3.7	11.7
132	Namibia	75.0	10.3	20.2	0.0	0.0	11.7
133	The former Yugoslav Republic of M	75.0	11.5	15.5	0.0	5.6	11.7
134	Papua New Guinea	87.5	14.9	13.1	0.0	0.0	11.3
135	Rwanda	50.0	18.4	13.1	0.0	0.0	11.3
136	Cameroon	87.5	19.5	6.0	0.0	1.9	10.9
137	Saint Kitts and Nevis	50.0	13.8	15.5	0.0	1.9	10.9
138	Paraguay	0.0	19.5	13.1	0.0	0.0	10.2
139	Solomon Islands	0.0	14.9	17.9	0.0	0.0	10.2
140	Egypt	0.0	20.7	9.5	0.0	0.0	9.5
141	Sierra Leone	75.0	11.5	8.3	0.0	5.6	9.5
142	Micronesia (Federated States o	75.0	11.5	10.7	0.0	0.0	9.1
143	Cuba	50.0	17.2	6.0	0.0	0.0	8.8
144	Marshall Islands	37.5	8.0	14.3	0.0	3.7	8.8
145	Republic of Moldova	75.0	10.3	7.1	0.0	3.7	8.4
146	Qatar	0.0	17.2	8.3	0.0	0.0	8.0
147	Bangladesh	87.5	14.9	0.0	0.0	1.9	7.7
148	Gabon	0.0	13.8	9.5	0.0	0.0	7.3
149	Gambia	37.5	10.3	7.1	0.0	3.7	7.3
150	Madagascar	37.5	9.2	7.1	0.0	5.6	7.3
151	Mauritania	87.5	9.2	2.4	0.0	3.7	6.9
152	Dominica	0.0	9.2	8.3	0.0	5.6	6.6
153	Turkmenistan	0.0	10.3	7.1	0.0	3.7	6.2
154	Djibouti	12.5	8.0	8.3	0.0	1.9	5.8
155	Lao’s, Peoples Democratic Rep	0.0	5.7	11.9	0.0	0.0	5.5
156	Democratic Republic of the Con	12.5	10.3	3.6	0.0	1.9	5.1
157	Nauru	0.0	8.0	8.3	0.0	0.0	5.1
158	Yemen	0.0	9.2	7.1	0.0	0.0	5.1
159	Ghana	0.0	9.2	6.0	0.0	0.0	4.7
160	Oman	0.0	8.0	7.1	0.0	0.0	4.7
161	Suriname	0.0	8.0	7.1	0.0	0.0	4.7
162	Syrian Arab Republic	0.0	9.2	6.0	0.0	0.0	4.7
163	Togo	37.5	8.0	2.4	0.0	1.9	4.7
164	Saint Vincent and the Grenadin	0.0	10.3	0.0	0.0	5.6	4.4
165	Vanuatu	25.0	5.7	6.0	0.0	0.0	4.4
166	Bhutan	0.0	4.6	7.1	0.0	1.9	4.0
167	Côte d'Ivoire	0.0	9.2	1.2	0.0	1.9	3.6

168	Antigua and Barbuda	25.0	0.0	8.3	0.0	0.0	3.3
169	Burundi	25.0	5.7	2.4	0.0	0.0	3.3
170	Grenada	12.5	9.2	0.0	0.0	0.0	3.3
171	Comoros	62.5	2.3	0.0	0.0	1.9	2.9
172	Ethiopia	0.0	5.7	2.4	0.0	0.0	2.6
173	Guinea	12.5	2.3	4.8	0.0	0.0	2.6
174	Zimbabwe	12.5	4.6	0.0	0.0	0.0	1.8
175	Mali	0.0	1.1	2.4	0.0	0.0	1.1
176	Niger	0.0	3.4	0.0	0.0	0.0	1.1
177	Sao Tome and Principe	0.0	0.0	2.4	0.0	1.9	1.1
178	Chad	12.5	0.0	1.2	0.0	0.0	0.7
	Countries with no web presence						
179	Central African Republic	0	0	0	0	0	0
180	Democratic People's Republic o	0	0	0	0	0	0
181	Equatorial Guinea	0	0	0	0	0	0
182	Eritrea	0	0	0	0	0	0
183	Guinea-Bissau	0	0	0	0	0	0
184	Haiti	0	0	0	0	0	0
185	Kiribati	0	0	0	0	0	0
186	Liberia	0	0	0	0	0	0
187	Libyan Arab Jamahiriya	0	0	0	0	0	0
188	Somalia	0	0	0	0	0	0
189	Tajikistan	0	0	0	0	0	0
190	Tuvalu	0	0	0	0	0	0
191	Zambia	0	0	0	0	0	0

Table 8 E-Participation Index 2004

			E participation
	Rank	Country	Index
1	1	United Kingdom	1.0000
2	2	United States of America	0.9344
3	3	Canada	0.9016
4	4	Singapore	0.8361
5	5	Netherlands	0.8033
6	6	Mexico	0.7705
7	6	New Zealand	0.7705
8	6	Republic of Korea	0.7705
9	7	Denmark	0.7377
10	8	Australia	0.6721
11	9	Estonia	0.6393
12	10	Colombia	0.6230
13	11	Belgium	0.6066
14	11	Chile	0.6066
15	12	Germany	0.5902
16	13	Finland	0.5738
17	13	Sweden	0.5738
18	14	France	0.4590
19	14	Malta	0.4590
20	15	Austria	0.4426
21	16	Hungary	0.3934
22	17	Norway	0.3607
23	17	Philippines	0.3607
24	18	Ukraine	0.3443
25	19	Poland	0.3115
26	20	Switzerland	0.2951
27	20	Turkey	0.2951
28	21	Israel	0.2787
29	21	Japan	0.2787
30	21	Panama	0.2787
31	21	Venezuela	0.2787
32	22	Belarus	0.2623
33	22	Honduras	0.2623
34	22	Indonesia	0.2623
35	23	Argentina	0.2459
36	23	Brazil	0.2459
37	23	El Salvador	0.2459
38	23	Mongolia	0.2459
39	24	Ireland	0.2295
40	24	Italy	0.2295
41	25	Bulgaria	0.2131
42	25	Czech Republic	0.2131

Table 8 E-Participation Index 2004

43	25	Kyrgyzstan	0.2131
44	25	Peru	0.2131
45	25	Portugal	0.2131
46	25	Romania	0.2131
47	25	Russian Federation	0.2131
48	25	Slovenia	0.2131
49	25	Thailand	0.2131
50	26	Croatia	0.1967
51	27	Latvia	0.1639
52	27	Pakistan	0.1639
53	28	Bolivia	0.1475
54	28	Cambodia	0.1475
55	28	Dominican Republic	0.1475
56	28	Luxembourg	0.1475
57	28	Mauritius	0.1475
58	28	Slovakia	0.1475
59	29	India	0.1311
60	29	Kazakhstan	0.1311
61	29	The former Yugoslav Republic of Mac	0.1311
62	30	Cape Verde	0.1148
63	30	Greece	0.1148
64	30	Iceland	0.1148
65	30	Malaysia	0.1148
66	31	Liechtenstein	0.0984
67	31	Nicaragua	0.0984
68	31	South Africa	0.0984
69	32	China	0.0820
70	32	Lebanon	0.0820
71	32	Lithuania	0.0820
72	32	Madagascar	0.0820
73	32	Senegal	0.0820
74	32	Trinidad and Tobago	0.0820
75	33	Comoros	0.0656
76	33	Congo	0.0656
77	33	Costa Rica	0.0656
78	33	Cyprus	0.0656
79	33	Guatemala	0.0656
80	33	Kenya	0.0656
81	33	Nepal	0.0656
82	33	Nigeria	0.0656
83	33	Uruguay	0.0656
84	34	Angola	0.0492
85	34	Bahrain	0.0492
86	34	Cameroon	0.0492

Table 8 E-Participation Index 2004

87	34	Ecuador	0.0492
88	34	Gambia	0.0492
89	34	Guyana	0.0492
90	34	Jamaica	0.0492
91	34	Jordan	0.0492
92	34	Saint Lucia	0.0492
93	34	Saudi Arabia	0.0492
94	34	Seychelles	0.0492
95	34	Sierra Leone	0.0492
96	34	United Arab Emirates	0.0492
97	35	Afghanistan	0.0328
98	35	Albania	0.0328
99	35	Algeria	0.0328
100	35	Andorra	0.0328
101	35	Armenia	0.0328
102	35	Bahamas	0.0328
103	35	Barbados	0.0328
104	35	Brunei Darussalam	0.0328
105	35	Burkina Faso	0.0328
106	35	Fiji	0.0328
107	35	Ghana	0.0328
108	35	Iran (Islamic Republic of)	0.0328
109	35	Iraq	0.0328
110	35	Maldives	0.0328
111	35	Mauritania	0.0328
112	35	Monaco	0.0328
113	35	Morocco	0.0328
114	35	Mozambique	0.0328
115	35	Myanmar	0.0328
116	35	Serbia and Montenegro	0.0328
117	35	Spain	0.0328
118	35	Sri Lanka	0.0328
119	35	Sudan	0.0328
120	35	Swaziland	0.0328
121	35	Uganda	0.0328
122	35	Yemen	0.0328
123	36	Azerbaijan	0.0164
124	36	Belize	0.0164
125	36	Benin	0.0164
126	36	Bosnia and Herzegovina	0.0164
127	36	Botswana	0.0164
128	36	Cuba	0.0164
129	36	Egypt	0.0164
130	36	Georgia	0.0164

Table 8 E-Participation Index 2004

131	36	Kuwait	0.0164
132	36	Lesotho	0.0164
133	36	Malawi	0.0164
134	36	Marshall Islands	0.0164
135	36	Papua New Guinea	0.0164
136	36	Paraguay	0.0164
137	36	Qatar	0.0164
138	36	Republic of Moldova	0.0164
139	36	Rwanda	0.0164
140	36	Saint Kitts and Nevis	0.0164
141	36	Saint Vincent and the Grenadines	0.0164
142	36	Samoa	0.0164
143	36	San Marino	0.0164
144	36	Timor-Leste	0.0164
145	36	Tunisia	0.0164
146	36	Turkmenistan	0.0164
147	36	United Republic of Tanzania	0.0164
148	36	Uzbekistan	0.0164
149	36	Vanuatu	0.0164
150	36	Viet Nam	0.0164
151	37	Antigua and Barbuda	0.0000
152	37	Bangladesh	0.0000
153	37	Bhutan	0.0000
154	37	Burundi	0.0000
155	37	Central African Republic	0.0000
156	37	Chad	0.0000
157	37	Côte d'Ivoire	0.0000
158	37	Democratic People's Republic of Kore	0.0000
159	37	Democratic Republic of the Congo	0.0000
160	37	Djibouti	0.0000
161	37	Dominica	0.0000
162	37	Equatorial Guinea	0.0000
163	37	Eritrea	0.0000
164	37	Ethiopia	0.0000
165	37	Gabon	0.0000
166	37	Grenada	0.0000
167	37	Guinea	0.0000
168	37	Guinea-Bissau	0.0000
169	37	Haiti	0.0000
170	37	Kiribati	0.0000
171	37	Lao’s, Peoples Democratic Republic	0.0000
172	37	Liberia	0.0000
173	37	Libyan Arab Jamahiriya	0.0000
174	37	Mali	0.0000

Table 8 E-Participation Index 2004

175	37	Micronesia (Federated States of)	0.0000
176	37	Namibia	0.0000
177	37	Nauru	0.0000
178	37	Niger	0.0000
179	37	Oman	0.0000
180	37	Palau	0.0000
181	37	Sao Tome and Principe	0.0000
182	37	Solomon Islands	0.0000
183	37	Somalia	0.0000
184	37	Suriname	0.0000
185	37	Syrian Arab Republic	0.0000
186	37	Tajikistan	0.0000
187	37	Togo	0.0000
188	37	Tonga	0.0000
189	37	Tuvalu	0.0000
190	37	Zambia	0.0000
191	37	Zimbabwe	0.0000

Annex 2: Technical Notes and Methodology

A. Technical Notes on the Survey Methodology and Assessment

a) Telecommunication Infrastructure Index

The Telecommunication Infrastructure Index 2003 is a composite weighted average of six primary indicators. These are: PCs/1000 persons; Internet users/1000 persons; Telephone lines/1000 persons; On-line population; Mobile phones/1000 persons; and TVs/1000 persons.

Data for UN member states was taken primarily from the UN International Telecommunication Union (ITU) and UN Statistics Division, supplemented by the World Bank. The data was standardized by constructing indices for each of the indicators as follows: Based on the scores of the countries, a maximum and minimum value is selected for each of the six indicators. The country's relative performance is measured by a value between 0 and 1 based on the following:

Indicator value = (Actual value - Minimum value) / (Maximum value - Minimum value). For example, for Singapore, which has 622 PCs per 1000 persons, the PC index = (622 - 0) / (760 - 0) = 0. 818.

Constructing the indices

Indicator (per 1000 persons)	Maximum Value	Minimum Value
PCs	760	0
Internet Users	648	0
Telephone lines	1040	0
Online population	698	0
Mobile subscribers	1061	0
TVs	965	0

The Survey deems the prevalence of PCs, Internet users, telephone lines and on-line population to be of far greater significance than mobile phones and TVs at this point in e-government service delivery worldwide, although it is acknowledged that governments can, and do, use other forms of ICT such as radio and TV to improve knowledge and service delivery to people. Consequently, the Telecommunications Infrastructure Index was constructed as a composite measure which assigns a 20 per cent weight to the first three variables and 5 per cent to the remaining two.

Infrastructure Index = 1/5 (PC index) + 1/5 (Internet user index) + 1/5 (Telephone line index) + 1/5 (On-line population index) + 1/10 (Mobile user index) + 1/10 (TV index)

b) Human Capital Index

Adult literacy is the percentage of people aged 15 years and above who can, with understanding, both read and write a short simple statement on their everyday life. Combined primary, secondary and tertiary gross enrolment ratio is the total number of students enrolled at the primary, secondary and tertiary level, regardless of age, as a percentage of the population of school age for that level. For country X, with an adult literacy rate of 96.3 per cent and a combined gross enrolment ratio of 81.2 per cent in 2002, the education index would be:

Adult literacy index = 0.963; Gross enrolment index =0.812; Education index = 2/3 (Adult literacy index) + 1/3 (Gross enrolment index) = 2/3 (0.963) + 1/3 (0.812) = 0.913

c) Web Measure Survey Methodology

In surveying each site, reviewers are instructed and trained to take the approach and mindset of an average citizen user. While it is possible, although implausible, to search the sites meticulously for all content and features, this approach misses the key point that the average user needs to find information and features quickly and intuitively for a site to be "usable." Even if the researchers had the resources to search for hours on end to find a specific feature or function at a given site, no average citizen or government website user would expend that kind of time or effort. The actual time spent for any given country review varies widely depending on how extensive the specific web system is, and generally how "good" or "bad" the actual websites are.

Selecting the appropriate site/URL at the national level

One of the baseline decisions for researchers when undertaking this survey was identifying the specific site(s) to review as the national government site for each country. Regardless of where a nation is in its e-government development, a priority should be to provide users a clear indication as to which of the potentially many government sites available is the "official" national government site—in a sense, the starting point for national users. Not only is this fairly easy to do—a simple, clear statement at the chosen website is sufficient to start—but also an important step toward providing government information and services to the public in an integrated, usable and easy-to-find manner.

The criteria included the following:

1. Is there a distinct national government site or portal?
2. Is there a Presidential or Prime Minister's site (whichever office heads the government of the country in question) that clearly states that it is the national government site?
3. Is there a site operated by another agency, ministry or other government body that is clearly identified as the national government site?
4. If none of the above, is there a viable Presidential or Prime Minister's site, even
if it is not clearly identified as the national government site (and as long as it is not simply a press or publicity site)? In other words, does it include information about the national government and its services even if there is no clear statement or indication that it is indeed the official national government site?

If no site could be found that clearly met any of the above criteria, then the country received no points for the Emerging Presence section of the survey because it was deemed that there was no "true" national site but rather a substitute national site had to be used.

It should be noted that while many sites illustrate some of the problems above, most have in fact engaged in the procedure of actually noting on their national site that it is their "Official" Government site, or Gateway to Government, or other such statement. A good example of creating and identifying a single government access point is the New Zealand national site, http://www.govt.nz, which clearly states the site's purpose up front: "Connecting you to New Zealand central & local government services." Such clear presentation is not limited to large, industrialized nations; the Samoa national site, http://www.govt.ws, for example, includes a large banner simply, but effectively, stating "Government of Samoa" and the header notes this is in fact "Government of Samoa – Official Website." These types of clear indicators on national sites obviously made the choice for researchers easy.

One perhaps ironic dilemma facing researchers were also those relatively few, but increasing, number of countries that provide more than one apparently legitimate national access point. While some have simply not yet consolidated their government entry points into a single site or portal that can be clearly distinguished, others have actually done this on purpose – offering different access points to different audiences. Since the use of integrated portals or websites is an increasing—and apparently effective—trend in the e-government strategies of states worldwide, when faced with this situation researchers selected as the primary site a National Portal or other portal if it was deemed to be the official homepage of the government; however, to accommodate strategy, more than one site could be scored if it was clearly part of a tightly integrated "network" of national sites.

Yet, sometimes the dilemma is even worse. Australia, for example, has several entry sites depending on purpose. The first is the true government entry point for citizens, http://www.australia.gov.au. A second site is the business entry point, http://www.business.gov.au, while a third is the "access to information" site that simply links to federal and region government sites, http://www.gov.au, and at the time the survey was undertaken there was a fourth, which claimed itself to be the official government site – it has since been consolidated into the first. For Australia then, as for other countries like it, researchers picked the one site that was most appropriate given the circumstances, which in this case is the first. While the second is indeed an entry portal its sole target is business – this survey is concerned mostly with citizens but in all information and services offered across the board and one specific group is too limited to constitute a "national site." Further, the first site is more extensive than the third and therefore appears to be a better starting point for citizens. After the starting point is chosen, other national government sites are included and taken in account provided the main site links to the other access points. Basically therefore, no country is penalized for setting up additional access points as long as they are clearly integrated in an easy to manage fashion.

Selecting the appropriate site/URL at the ministry level

One key obstacle is the fact that some countries do not offer certain public services at the federal level, but rather at the regional level. It should be made clear that no country is penalized for offering a service at the regional as opposed to the federal level per se. A second dilemma, albeit more minor, are those countries where one, or more, ministries are combined into one. Most notably, a fair number of countries have a "Ministry of Health and Social Welfare." In these cases the ministry is assessed as usual and its score simply multiplied by two.

d) E-Participation Methodology

The E-participation index is segmented into three sections that track qualitative changes in the Survey. These are: e-Information, e-Consultation, and e-Decision Making. As in 2003, E-participation scoring assesses 'how useful' these features were and 'how well were they deployed by the government'. Sometimes variations among countries were enormous. For example, compare the quality of the open-ended discussion forum provided by Nigeria with that of the U.K. and one quickly realizes what qualitative differences are all about. Providing such an index to complement the raw data, therefore, is an important and valuable means to evaluate both the efforts of governments and the actual quality of the information and services provided.

Focusing primarily on the national site while also considering the ministry sites, the original reviewers—who often had spent many hours reviewing a nation's collective sites—completed the E-participation section of the survey for each country they reviewed. The original reviewers were then asked to go back and refine their scoring of the E-participation section after they had completed all of their sites; researchers sometimes found, for instance, that they may have scored their earlier sites too leniently or too harshly when compared to their scoring of later sites. The e-participation scores were then normalized by the lead researcher and one additional reviewer who together systematically reviewed every national site (with the help of translators when necessary) and E-participation scoring sheet following the close-out of data collection. Sites were compared to other, similar sites, and various sensitivity indexes were created from the quantitative data to help identify clear over or underscoring. Finally, "clusters" of sites that received the same or very close scores were reviewed and compared to each other so that any variations and/or similarities in scoring could be reasonably explained.