

## Chapter 16

# The information society: visions and realities in developing countries

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**The vision of an information-enabled** globally-connected knowledge-based society is driven in large part by the smooth integration of new media (information and communication technologies or ICTs) with traditional media, coupled with technical skillsets, forward-looking government policies, an attitude of life-long learning, and a desire to improve efficiencies and harness innovation in a humanely and environmentally sustainable manner.

| 271

This chapter explores dimensions of “breadth and depth” of the information society vision, by presenting a framework for comparing the maturity of different information societies as well as the progress that an individual country has made in its various national ICT initiatives. This framework is used to strengthen existing analyses of the information society and present new roadmaps for researchers and policymakers.

It charts the instrument and industry aspects of ICTs in developing nations, using a comparative framework developed over the years by the author called the “8 Cs” of the digital economy (parameters beginning with the letter C): connectivity, content, community, commerce, culture, capacity, cooperation and capital.

There are two ways of looking at ICT: as an instrument, and as an industry. As an instrument, affordable and usable ICTs can indeed transform the way societies work, entertain, study, govern and live –at the individual, organizational, sector, vocational and national levels. As an industry, ICTs represent a major growing economic sector covering hardware, software, telecom/datacom and consulting services.

Coupled with these two aspects of ICTs (usage and creation), the “8 Cs” framework is used to tease apart some of the key challenges in implementing the vision of knowledge societies, such as increasing ICT diffusion and adoption, scaling up ICT pilot projects, ensuring sustainability and viability of ICT initiatives, creating ICT industries, and systematically analysing research on the global information society. The role of local stakeholders, multilateral agencies, donor institutions and the development community is highlighted. Based on a combination of the “instrument” and “industry” aspects of parameters like connectivity, content, capacity and culture, the information societies of the world can be divided into eight categories: restrictive, embryonic, emerging, negotiating, intermediate, mature, advanced, and agenda-setting.

Through both lenses –instrument and industry– the performance of developing nations lags that of developed nations, but interesting patterns of variation and pockets of excellence are emerging. For instance, India has a thriving content sector and IT industry –but it also has a looming digital divide where ICTs are not accessible or affordable as instruments for a majority of the population. Countries like China have emerged as IT powerhouses –but are still nervous about the impacts that unfettered flows of Internet information can have on their political system.

### **ICT impacts: a sector-wise analysis**

According to ITU findings, 80% of the 500 million Internet users worldwide are in the developed world, and two out of every five people in developed countries are online while only one in 50 has access to the net in developing countries. The Internet in the developed countries is approaching the status of a mainstream medium, but has a long way to go in attaining similar levels of penetration in developing countries. Still, some of the applications and benefits of the information society are becoming evident in developing countries as well.

Despite the yawning digital divide, numerous success stories have emerged of ICT practices in developing countries, even spurring studies on the potential of ICT for poverty alleviation. As these anecdotal reports and project successes began to gather steam, numerous studies and frameworks emerged to provide a more solid theoretical foundation to the nature, evolution and impacts of the information society. These can be classified into the following types of studies: infrastructural, market-oriented, political, cultural, policy-oriented, comparative, regional and strategic. It would be useful to survey some of the relevant literature to arrive at contextualised perspectives on the information society.

For example, Thurow (1999) adopts an international approach (with specific regional and national case studies around the world) to the growth of the new economy. Challenges to accelerating global Internet diffusion and overcoming the digital divide are well charted in the annual reports of the UNDP and World Bank, as well as in special reports of UNCTAD, the Markle Foundation and the Digital Opportunity Task Force.

Ramanathan and Becker (2001) offer a wide-ranging set of essays covering the early stages of the Internet growth in Asia. Tan, Corbett and Wong (1999) offer an academic treatment of developments in IT education, infrastructure and e-commerce in the Asia-Pacific region; much of the data is drawn from the early and mid-1990s. Funk (2001) offers an excellent case study of the growth of the mobile Internet in Japan, innovative content models and consumer utilities for wireless users, and the experience in transferring these models to other markets like Europe.

The importance of the Internet as a component of national infocomm, media and infrastructural policies has been acknowledged by a growing number of countries around the world, and books have been recently published about the information society strategies of for example Britain (Barnett, 2000) and India (Manzar, Rao and Ahmed; 2001). Naroola (2001) covers the growing success of Indian entrepreneurs in Silicon Valley's Internet economy; Singhal and Rogers (2001) touch on the domestic potential of the Internet in India, and Rajora (2002) provides a detailed case study in India of the community-centre model of Internet access and local e-commerce.

Focusing more on the infrastructural and capacity constraints of developing nations, systematic attempts to characterize and categorize instances of ICT application in developing nations have emerged, as in the recent reports of the UNDP, Digital Opportunity Task Force, Markle Foundation, Regency Foundation and Bridges.org.

These typically involve a sector-wise or activity-based approach to ICT impacts on society, such as public health, disaster relief, education, media, civil society, agriculture, industry, services, trade, banking/finance, hospitality, transportation, law enforcement, commerce, government services, politics, cultural identity, workforce and diaspora populations.

ICTs can indeed bring benefits to each of these spheres of activity, via a whole host of applications. Numerous such initiatives have been launched by the cooperative efforts of local and international stakeholders, as summarised in Table 1.

**Table 1: ICTs in developing countries: applications, benefits and active organisations**

	<b>Applications</b>	<b>Benefits</b>	<b>Organisations</b>
Healthcare	<ol style="list-style-type: none"> <li>1. Telemedicine (audio/image transmission, collaboration eg. for radiology)</li> <li>2. Digital publication of medical research</li> <li>3. Outsourcing of services</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased productivity, reduced travel costs</li> <li>2. Broader service reach for experts</li> <li>3. More responsive healthcare services for citizens</li> </ol>	World Health Organisation, Medline (NLM), MaterCare
Agriculture	<ol style="list-style-type: none"> <li>1. GIS systems for planning</li> <li>2. Tele-education, scientific databases</li> <li>3. Telecentres, information services for pricing</li> </ol>	<ol style="list-style-type: none"> <li>1. More awareness of innovative approaches</li> <li>2. Improved food production</li> <li>3. Seasonal planning, risk mitigation</li> </ol>	FAO, WFP, CGIAR, Developing Countries Farm Radio Network, MAYAnet, FarmNet, Famine Early Warning System, GAINS, AgriWatch

Table 1 (cont.)

	<b>Applications</b>	<b>Benefits</b>	<b>Organisations</b>
Education	<ol style="list-style-type: none"> <li>1. Distance education</li> <li>2. Teacher training</li> <li>3. Indigenous education</li> </ol>	<ol style="list-style-type: none"> <li>1. Improved visualisation skills</li> <li>2. Up-to-date course materials accessible from remote areas</li> <li>3. Cost savings, on-demand education</li> </ol>	OLSET program (South Africa), TeleSecundaria (Mexico), African Virtual University, Orbicom, SchoolNet, RCP
Business	<ol style="list-style-type: none"> <li>1. e-Banking, e-stockbroking</li> <li>2. Logistics management</li> <li>3. Global trading platforms</li> </ol>	<ol style="list-style-type: none"> <li>1. Efficiency, less delays</li> <li>2. Lower costs of marketing</li> <li>3. Global exposure</li> </ol>	UNCTAD, UNTPDC, WTO, TradeCompass
Media/cultural industries	<ol style="list-style-type: none"> <li>1. Digital newsrooms</li> <li>2. Archival technology, methodologies, standards</li> <li>3. New media formats</li> </ol>	<ol style="list-style-type: none"> <li>1. More responsive news cycles</li> <li>2. Preservation of local cultural forms via archives, interactive CD-ROMs and web sites</li> <li>3. Global projection of local media, culture</li> </ol>	UNESCO, OneWorld, DigitalPartners, WorldSpace, Drik
Environment	<ol style="list-style-type: none"> <li>1. GIS mapping</li> <li>2. Networking of environmental activists</li> <li>3. Databases of crop patterns</li> </ol>	<ol style="list-style-type: none"> <li>1. Better management of resources</li> <li>2. Planning for disaster aversion</li> <li>3. Improved awareness among activists</li> </ol>	World Bank GIS Laboratory, OneWorld, IntelSAT, ESRI, ICLEI, WorldWatch, VITA, APC, SDNP, ICLEI
Governance	<ol style="list-style-type: none"> <li>1. Online information for citizens, businesses, NGOs</li> <li>2. Planning and management of transportation</li> <li>3. Simplified procedures for international business</li> </ol>	<ol style="list-style-type: none"> <li>1. Less wastage of citizens' time, better access to crucial information</li> <li>2. Improved accountability of government officials</li> <li>3. Simplified tax procedures for business</li> </ol>	USAID, ActionAID, Transparency International, APC, CDT
Urban development	<ol style="list-style-type: none"> <li>1. Urban planning, service delivery</li> <li>2. Public telecom, Internet facilities</li> <li>3. Urban telecentres</li> </ol>	<ol style="list-style-type: none"> <li>1. Shared infrastructure for multiple sectors</li> <li>2. Better coordination of digging up roads</li> <li>3. Urban telecentres</li> </ol>	International Healthy Cities Foundation, SDNP, ICLEI, ADB
Rural development	<ol style="list-style-type: none"> <li>1. Rural community networks, public call office</li> <li>2. Rural tourism</li> <li>3. Healthcare</li> </ol>	<ol style="list-style-type: none"> <li>1. Rural community networks become economic drivers</li> <li>2. New employment opportunities</li> <li>3. Access to government services from remote locations</li> </ol>	APDIP, SDNP, ITU, Grameen Bank, CIDA

With inputs from "Telecommunications in Action" (Regency Foundation, 1999).

Multilateral organisations ranging from the UN to the World Bank and non-profit foundations ranging from Bridges.org to the Markle Foundation generally make the same overall recommendation: that ICTs can cost-effectively create and unleash the developmental force of human socio-economic and political net-

works. For emerging economies –and particularly least developed countries– the key challenge will be to align the interests and strengths of various constituents of society and find their appropriate niches in the global information society. Unless adequate steps are taken to increase local ICT capacities, the “digital divide” may exacerbate the existing social and economic inequalities between countries and communities; the potential costs of inaction are greater than ever before.

## The “8 Cs” framework

While analysing the impact and potential of ICTs by economic sector is a useful first step (as illustrated in Table 1), it misses a crucial factor: ICTs like the Internet cannot be interpreted merely as digital forms of telecommunications, or as mere computers, or as media outlets. Many early well-intentioned ICT projects in developing countries failed because they were too technology-centric or stopped merely at the installation phase of computers. The information society is not just about connectivity to the global information infrastructure, but about the 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 such information spaces. The information society is not just about passively using “black box” technologies, but about actively creating and shaping the underlying technical, information and service infrastructure. Thus, a more powerful framework is needed which can contextualise ICT diffusion, usage and creation with respect to these attributes.

Accordingly, this author has evolved an approach over the years for analysing information societies in the digital age, called the “8 Cs” framework: connectivity, content, community, commerce, culture, capacity, cooperation and capital. This applies both to the instrument (usage) and industry (creation) aspects of ICTs, as outlined in Table 2.

## Connectivity

The digital divide in developing countries is most evident at the phase of connectivity, i.e. lack of affordable access to PCs, Internet devices, modems, telephone lines, and Internet connections. Steps to reduce this digital gap include devising cheaper access devices (such as publicly accessible kiosks), lowering tariffs on import of computers and modems, creating Internet community access centres (with leased lines and shared devices), and bringing access rates down by creating a favourable climate of competition between Internet Service Providers (ISPs).

The regulatory climate in many emerging economies has only recently welcomed private sector ISPs, and a key challenge lies in creating a level playing field between government-owned and private sector ISPs (in terms of operating licenses, tariffs, cross-subsidies, and setting up international gateways). A government ISP player with a monopoly in one area (eg. VSAT links, last mile connectiv-

276 | ity, international telecoms) should not use this monopoly power to wipe out an entire industry in another sector.

Work has begun on initiatives to increase Internet diffusion via kiosks (in Bangladesh), community centres (in Peru), cybercafes (in Ecuador), wireless delivery and non-PC devices (in India), but much innovation and investment is still called for here.

Costs of dialup and leased lines are dropping, but could become more affordable. Organisational adoption of Intranets and Extranets (and hence VPN services by ISPs) is only slowly emerging in developing countries. Universal access issues and peering agreements will continue to dominate the ISP scenario in many emerging economies for the coming years.

Special concerns arise in cross-country wiring for regions with mountainous terrain, large arid tracts, or with a high density of island space.

No peering agreements for forming national (let alone regional) Internet exchanges exist in most emerging economies; most inter-ISP traffic is routed via the U.S., Europe or East Asia. Much potential lies in the hands of the public sector units, such as the power grid and railway authorities who have existing secure cable connections across the region. National ISP organisations also need to form to create greater collective bargaining power and to pool assets.

## Content

The digital divide between nations arises not just in number and density of ISPs, hosts connected to the Net, proportion of individual users online, Internet diffusion ratios, and number of organisations with leased line connections. This imbalance also extends to content, in terms of number of web sites in developing countries, amount of local language content, and use of online content by key sectors.

There are at least seven measures of market maturity for online content in a country (Rao, 2002):

- » total number of web sites about (and published in) the country
- » local relevance and usefulness of this content
- » local language standardisation and usage on the web
- » amount of sub-national content (about states, provinces, cities)
- » presence of meta-content like directories and search engines
- » amount of ad revenues targeted at online audiences via these sites
- » the presence of third-party services from online traffic auditors, ad revenue auditors and market research groups.

Emerging economies need to increase activity along each of these seven dimensions in order to help reduce the content gap. News media, public health services, government-citizen resources, NGOs, SMEs, and emergency relief organisations need to make more content and services available online.

World-class hosting infrastructure must be created in emerging economies so that locally generated content will be predominantly hosted in the region and not outside, this saving lucrative foreign exchange revenues and safeguarding information sovereignty.

## Community

Online and offline fora need to be actively promoted to bring in larger and more diverse sections of community to discuss issues of common interest, especially with regard to creatively tackling the digital divide.

While much attention is focused on web publishing, email fora for content distribution and discussion can still play a useful role –especially in areas where bandwidth is low and the quality of phone connections is poor. In that sense, email-based discussion lists are an under-utilised channel in online communications for many emerging economies.

## Commerce

Advanced Internet economies have moved beyond basic Internet infrastructure to dynamic e-commerce infrastructure: payment gateways, secure channels, digital certification authorities, overnight courier services, third party audit services, and online tracking capabilities.

To move beyond being mere destinations for e-commerce sales from U.S. and European sites, emerging economies need to close the “e-commerce gap” by effectively building a domestic Internet economy and promoting online transactional capabilities for the consumer, business and government sectors.

This includes updating existing business and intellectual property rights laws to accommodate electronic contracts, online funds transfer, and stronger consumer fraud protection laws. Malaysia’s cyberbill and India’s IT Act 2000 fall in this category.

## Capacity

To close the “digital skills gap”, emerging economies need to improve the capacity of their workforces for Internet age roles. This includes improving Internet access and educational offerings in schools and colleges, creating digital libraries for universities, and promoting professional training institutes.

The Internet should also be strongly promoted among sectors which already have the capacity to harness it. Key priority areas for such Internet growth include the software and web solutions/services sectors, whereby an emerging economy can harness the net not just as a tool but as a market in its own right.

Challenges also arise in closing the “techno-legal gap” in crucial capacity areas like cyberlaw. Legal developments concerning content classification, regulation and enforcement in countries around the world must be tracked. Regional representatives from the industry, academia and government should try

278 | to be present in forums of the UN, WTO, OECD, G-7, ASEAN, and APEC, dealing with cyberspace content issues like intellectual property rights, copyright protection, online privacy, online crimes, and digital watermarks.

**Culture**

This is probably the biggest challenge in closing the digital gap, and involves overcoming cultural inhibitions and insecurities about developing competence for surviving in the break-neck speed of the Internet age.

It includes getting governments in emerging economies to stop treating their telecom monopolies like cash cows, and instead getting government telecom players to invest in areas like R&D on Internet telephony, so that the technology is seen as a market opportunity on a global scale and not a threat on a local scale.

It also includes getting career-track diplomats, bureaucrats, academics and public sector employees to take up Internet training and harness the opportunities as well as the plentiful challenges that accompany Internet diffusion.

In areas like making government procedures transparent, a lot of political will and muscle will be needed. For instance, in areas like land records and getting power connections, some unscrupulous middlemen tend to get involved; openness and transparency will threaten them, but the government must display the political to clean up these processes via open content publishing.

Most importantly, it entails the creation of a risk-taking culture, where accepting some initial failures by entrepreneurs should not be treated as sign of weakness or loss of face; high mobility between jobs should also be accepted as a reflection of a high pace of skill acquisition.

**Table 2: the "8 Cs" of the information society**

	<b>ICTs as an instrument</b>	<b>ICTs as an industry</b>
Connectivity	How affordable and widespread are ICTs (eg. PCs, Internet access, software) for the common citizen?	Does the country have ICT manufacturing industries for hardware, software, datacom solutions and services?
Content	Is there useful content (foreign and local) for citizens to use in their daily lives?	Is content being generated in local languages and localised interfaces? Is this being accessed/used abroad?
Community	Are there online/offline forums where citizens can discuss ICT and other issues of concern?	Is the country a hub of discussion and forums for the worldwide ICT industry?
Commerce	Is there infrastructure (tech, legal) for e-commerce for citizens, businesses and government? How much commerce is transacted electronically?	Does the country have indigenous e-commerce technology and services? Are these being exported?
Capacity	Do citizens and organisations have the human resources capacity (tech, managerial, policy, legal) to effectively harness ICTs for daily use?	Does the country have the human resources capacity (tech, managerial, policy, legal) to create and export ICTs, and set standards?



Table 2 (cont.)

	ICTs as an instrument	ICTs as an industry
Culture	Is there a forward-looking, open, progressive culture at the level of policymakers, businesses, educators, citizens and the media in opening up access to ICTs and harnessing them? Or is there nervousness and phobia about the cultural and political impacts of ICTs?	Are there techies, entrepreneurs and managers pro-active and savvy enough to create local companies and take them global?
Cooperation	Is there adequate cooperation between citizens, businesses, academics, NGOs and policymakers to create a favourable climate for using ICTs?	Is there a favourable regulatory environment in the country for creating ICT companies, M&A activity, and links with the diaspora population?
Capital	Are there enough financial resources to invest in ICT infrastructure and education? What is the level of FDI?	Is there a domestic venture capital industry? Are they investing abroad as well? How many international players are active in the local private equity market? Are there stock markets for public listing?

## Cooperation

No single sector can take on the Internet economy by itself; much cooperation at the national level is needed to overcome the sectoral gaps between government, academia, private sector, civil society, and international organisations. This should happen at the state/provincial, national and regional levels; it can also extend to groupings based on culture (eg. Latin America) or language (eg. between the five countries where Tamil is an official language).

A better characterisation would perhaps be the term “coopetition”, where traditional competitors team up to a certain degree to grow the entire Internet pie instead of fighting over small slices. Activities like forming Internet advertising bureaus, national Internet industry associations, and chapters of the Internet Society fall in this category.

## Capital

The highly volatile Internet economy is making it all too evident that the best chances for an Internet initiative to survive are if it is at least economically self-sustaining.

Thus, the role of government should focus on creating open investment climates for incubation, launch, acceleration and IPO phases of an Internet start-up. The government need not spend excessive funds on incubation projects of its own; it should create conditions and safeguards conducive for the movement of domestic and international capital into the new economy.

Domestic venture capital funds and skills must be promoted, otherwise the “capital gap” in many emerging economies may lead to an excessive and unhealthy dependence on the umbilical cord of high-technology exchanges like NASDAQ in the U.S.

As for capital for software investments, use of freeware and shareware packages and tools should be encouraged where possible, instead of relying on costly proprietary software solutions, such as in the use of the Linux operating system and Apache Web server for digital publishing.

Based on this “8 Cs” framework, a more sophisticated analysis of the evolution of the information society is possible, for developed and developing nations. The framework allows for a detailed sector-wise SWOT (strength-weakness-opportunity-threat) analysis along these 8 parameters which are all necessary conditions for success, thus enabling the identification of potential obstacles and strengths in the growth of the information society in developing nations.

Unless care is taken to adequately address all the 8 Cs for each of the sectoral ICT projects or policies, the initiatives will not be sustainable or scaleable across the entire country. For instance, telecentres may not be a financially sustainable access option (“connectivity”) unless fee-based services (“commerce”) are blended with free services for marginalised communities; this will typically require the joint efforts (“cooperation”) between development activists and IT-savvy (“capacity”) local entrepreneurs. Linguistic and cultural diversity (“content”) will not be feasible in the online medium unless local language tools are made affordable and easy to use for content generation and archival; this also calls for standardisation (via “cooperation”) of local language representation codes (eg. Unicode) and keyboard layouts, which has been problematic for some Asian languages like Tamil and Khmer.

For the purpose of this chapter, Table 3 teases apart the ICT scenario in developing nations only, focusing largely on innovative responses to the challenges of ICT diffusion and adoption.

**Table 3: Innovative responses to the challenges of harnessing ICTs in developing countries: the “8 Cs” framework of necessary conditions**

	Education	Business	Government	Civil Society	Healthcare	ICT Industries
Connectivity	Low cost or free access to higher education institutes, followed by schools. <i>Examples:</i> KENET, IRANET	Cybercafes for SMEs. <i>Examples:</i> <i>iWay cybercafe chain in India</i>	Special ISPs for government agencies. <i>Examples:</i> <i>National Informatics Centre</i>	Telecentres, low-cost devices. <i>Examples:</i> <i>PubliNets in Tunisia, RCP (Peru), Internet Bus (Malaysia), WLL/CorDECT, InfoCentros (El Salvador)</i>	Handheld devices, health centres, low cost ISPs. <i>Examples:</i> <i>HealthNet</i>	Low cost high-bandwidth Internet access. <i>Examples:</i> <i>STPI</i>

Table 3 (cont.)

	Education	Business	Government	Civil Society	Healthcare	ICT Industries
Content	Digital libraries. <i>Examples: African Digital Library, African Journals Online</i>	Directories of exporters, MP3 files for music. <i>Examples: HoneyBee Network</i>	Publishing of government content online, interactive services. <i>Examples: e-Census (Philippines)</i>	Content support for rural constituencies, open source tools and open content. <i>Examples: MahilaWeb (Nepal), Centre for Education and Documentation</i>	Tele-radiology, medical journals. <i>Examples: OphthoNews, HELINA-L, MEDINET</i>	Low-cost IT books in India, Webzines about IT industry
Community	Forums for teachers, administrators. <i>Examples: Community learning centres in Ghana, Kenya</i>	Forums for tourism operators. <i>Examples: MarketWatch (Mongolia)</i>	e-Government forums	Rural community networks. <i>Examples: e-Bario (Malaysia), Mountain Forum, VOICES (India), SIDSNet</i>	Forums for AIDS workers. <i>Examples: InfoDev</i>	Lobbying organisations, open source initiatives. <i>Examples: Computer Association of Nepal, NASSCOM in India.</i>
Commerce	Online courses. <i>Examples: African Virtual University</i>	Hybrid payment options. <i>Examples: AfricaOnline, PeopLink, Central Asia Craft Support Association, PAN-Asia</i>	Interactive services for filing taxes online, tenders. <i>Examples: e-Dirham (UAE)</i>	Services for finding prices in urban markets. <i>Examples: Gyandoot</i>	Pricing of e-Health services. <i>Examples: medical transcription in Philippines</i>	Outsourced tech support
Capacity	Workshops for course developers. <i>Examples: Distance education centres in Mauritius</i>	Workshops in cybercafes, dedicated centres. <i>Examples: Metrocomia, Cisco's Networking Academies</i>	Workshops for government officials. <i>Examples: Leland Initiative</i>	Workshops for rural communities. <i>Examples: Nairobits, "Internet clubs" in Egypt, Global Forest Watch</i>	Workshops for healthcare professionals.	Conferences, private sector educational institutes
Culture	Academic networks. <i>Examples: Egyptian Universities Network</i>	Formation of cyberlaws	National policy bodies. <i>Examples: ICT Task Force of Tanzania</i>	Freedom of Information Act	Launching teleconsultation services	Global outlook. <i>Example: The Indus Entrepreneurs</i>

Table 3 (cont.)

	Education	Business	Government	Civil Society	Healthcare	ICT Industries
Cooperation	Formation of consortia, partnerships with ISPs. <i>Examples: AfricaOnline</i>	Support from diaspora networks	Regional caucuses <i>Examples: e-ASEAN</i>	Governance of Internet infrastructure. <i>Examples: APNIC, IPEF</i>	Worldspace, HealthNet, GIPI Project	Joining standards organisations. <i>Examples: AfINOG</i>
Capital	Spinning off academic networks as private ISPs. <i>Examples: Centre for Informatics (Mondlane University)</i>	Investments by entrepreneurs, formation of regional ISPs. <i>Examples: DOT Force Entrepreneur Network</i>	Removal of taxes from computers	Pilot projects by UN, World Bank	Fee-based services for tele-cardiology in Jordan	Intellectual property rights, licensing, venture capital funding. <i>Examples: FONTEC fund (Chile)</i>

Source: Madanmohan Rao (2003), "Visions of the Information Society"  
<<http://www.itu.int/osg/spu/visions/Conference/index.html>>.

## The information society: visions, realities and positioning

Despite recent turbulence in the so-called "new economy", it is undeniable that new ICTs like the Internet can, under appropriate conditions, transform businesses and markets, change learning and knowledge-sharing, generate global information flows, empower citizens and communities in new ways that redefine governance, and create significant wealth and economic growth in many countries.

The "8 Cs" framework can be used not only to analyse ICT initiatives within a sector, community or country, but also to compare and categorise different information societies. Based on a combination of the "instrument" and "industry" aspects of parameters like connectivity, content, capacity and culture, the countries of the world can be divided into eight categories: restrictive, embryonic, emerging, negotiating, intermediate, mature, advanced, and agenda-setting. ICT diffusion for the populace, strength of online content and cultural sectors, and the projection of domestic ICT industries progressively increase along the spectrum, as does openness of political expression (see Table 4).

Developing nations in the "restrictive" phase include countries like North Korea, where an authoritarian regime and foreign policy pressures have cramped the ICT benefits that the citizens could have otherwise enjoyed. Developing countries like Afghanistan and East Timor have moved on into the next phase: "embryonic", where information infrastructure was not well established or was largely destroyed, and ICT initiatives are now largely being driven by donor agencies.

Large digital divides and extensive donor activities still persist in the next class of information society – "emerging" – but local ICT capacities have

emerged and formal ICT policies have been formed (eg. Nepal, Bolivia). Infrastructure and production for Internet and wireless communication are much more widespread and robust in the next category –“negotiating”– but the government is concerned over the political dissent and cultural changes that can be ushered in by unfettered Internet access. Such countries (eg. China) actively promote ICT infrastructure and deployment, but wish to exercise strong control over online content and search engines.

Staying away from political and cultural censorship of new media is a defining characteristic of the next phase of information society –“intermediate”– while also having local ICT capacities and some international ICT or outsourcing players co-existing with large digital divides and active donor presence (eg. India, Brazil, South Africa).

Donor agencies need not play as active a role in the next category of information society –“mature”– where funding for ICT initiatives comes mostly from government agencies or from public-private partnerships. These countries –like Australia and much of Europe– also have large-scale penetration of Internet and wireless, and mature business models for online content and commerce.

**Table 4: Classification of information societies based on the “8 Cs” framework**

Type	Characteristics	Examples
Restrictive	<ol style="list-style-type: none"> <li>1. ICT infrastructure is very limited</li> <li>2. ICT usage is tightly controlled by government</li> <li>3. Awareness of ICT among general population is very low</li> </ol>	North Korea, Myanmar
Embryonic	<ol style="list-style-type: none"> <li>1. ICT infrastructure is just being rolled out</li> <li>2. Donor agencies are active in funding and providing human resources</li> <li>3. Most ICT activity is driven by diaspora, NGOs</li> </ol>	Afghanistan, East Timor, Iraq
Emerging	<ol style="list-style-type: none"> <li>1. Internet infrastructure exists in urban areas</li> <li>2. Local capacities exist for ICTs, policy bodies are being formed</li> <li>3. Widespread digital divide exists, e-commerce is not yet widely prevalent</li> </ol>	Nepal, Bangladesh, Bolivia, Nigeria
Negotiating	<ol style="list-style-type: none"> <li>1. Widespread Internet/wireless infrastructure exists</li> <li>2. Local capacities and markets exist for ICTs, e-commerce</li> <li>3. Government is “negotiating” benefits and challenges of new media; authorities exercise strong control over online content, search engines; political and cultural censorship of Internet is practised</li> </ol>	China
Intermediate	<ol style="list-style-type: none"> <li>1. Sizeable markets for Internet, e-commerce, wireless exist</li> <li>2. Digital divide is still an issue, donor agencies are active</li> <li>3. Political climate is generally free of censorship for traditional and online media</li> </ol>	India, Philippines, Brazil, South Africa
Mature	<ol style="list-style-type: none"> <li>1. Large-scale penetration of Internet, wireless</li> <li>2. Mature business models for online content</li> <li>3. Political climate is generally free of censorship for traditional and online media</li> </ol>	Australia, New Zealand, Italy
Advanced	<ol style="list-style-type: none"> <li>1. Large-scale penetration of broadband and wireless Internet (including 2.5G, 3G)</li> <li>2. Political climate is generally free of censorship for traditional and online media</li> <li>3. Some ICT companies are major players in global markets; wireless content models are being exported</li> </ol>	Japan, South Korea, Sweden

Table 4 (cont.)

Type	Characteristics	Examples
Agenda-setting	1. Large-scale penetration of ICTs, global powerhouses in ICT 2. Political climate is generally free of government censorship 3. National policies on ICTs in these countries are generally followed by other countries, their ICT media and academic journals are dominant on an international scale, donor agencies of these countries drive many ICT initiatives in developing countries	US

Countries in the “advanced” phase have gone a step further –their ICT industries have become global giants (eg. Japan, South Korea, Sweden), in addition to providing cutting-edge infrastructure like broadband Internet and 2.5G/3G wireless. But “agenda-setting” information societies are key players not only in the ICT industry sector but also in formulating regulations and policies regarding convergent media and cyberlaws, publishing academic literature on the information society, thought leadership in news media of the ICT sector, and creating donor programs for ICT initiatives in developing countries.

The challenge for developing nations is to move at least to the “mature” stage on this spectrum. The goal should be to not just be able to tap the world’s pool of collective knowledge, but contribute actively in increasing the pool in the information age.

This classification of countries into eight categories is more sophisticated than a mere binary classification of countries into “developed” and “developing” –the spectrum actually allows for five categories of developing countries and three categories of the developed.

This framework for classifying information societies is also much broader and comprehensive than that of the UNDP, which categorises countries into one of only four groups based on ICT performance: leaders (eg. U.S., Sweden, Japan, Korea, Singapore, Australia), potential leaders (Spain, Italy, Hong Kong, Malaysia), dynamic adopters (Thailand, Philippines, China, Indonesia, Sri Lanka, India), and marginalized (Pakistan, Senegal, Nepal). Potential leaders have diffused old technologies widely but innovate little; dynamic adopters have important hi-tech hubs but the diffusion of old technologies is incomplete. Developing countries typically have four choices of policy stances towards new technological innovation: promotional, permissive, precautionary and preventive. This calls for a balance between the freedom to innovate and the desire to mitigate risks.