**ICT Indicators**

### Basic features

- Conventional ICT indicators are national in scale and relate to access, quality, affordability, institutional efficiency and sustainability, and select applications (The World Bank, 2007). They differentiate between residential and business users, but not between rural and urban, nor men and women.
- Readiness frameworks integrate national indicators across several themes: regulation, policy, connectivity, e-government, e-networking, and e-learning. These frameworks are also national in scale (see [www.readinessguide.org](http://www.readinessguide.org)).
- Projects will often focus on indicators that are specific to their sector (education, health, etc.). At this scale, the notion of relevant use challenges projects to focus attention on local content, affordability and the sustainability of local access (Gurstein, 2003).

### Examples of Household and Business Indicators

<table>
<thead>
<tr>
<th>Households</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Presence of electricity, radio, fixed and mobile phone, TV, computer, and Internet access in household</td>
<td>• Presence of electricity, mobile devices, PC, Mac, Laptop, and Internet access, local network, web site</td>
</tr>
<tr>
<td>• Methods of access/bandwidth for Internet</td>
<td>• Methods of access/bandwidth for Internet</td>
</tr>
<tr>
<td>• Location of the most frequent use of Internet; frequency of use</td>
<td>• Recent ICT investments</td>
</tr>
<tr>
<td>• Purpose of PC use, of Internet use</td>
<td>• Share of total number of employees using a PC, a PC connected to the Internet in their normal work routine</td>
</tr>
<tr>
<td>• Concrete services/activities purchased; types of services/products purchased; value of goods purchased over the Internet</td>
<td>• Concrete services/activities purchased; types of services/products purchased; value of goods purchased over the Internet</td>
</tr>
<tr>
<td>• Language of Internet sites visited</td>
<td>• Training/formation in ICT use for employees</td>
</tr>
<tr>
<td>• Barriers to PC use, to purchases over the Internet</td>
<td>• Barriers to PC use, to purchases over the Internet</td>
</tr>
<tr>
<td>• Geographic location where the Internet goods are purchased</td>
<td>• Geographic location where the Internet goods are purchased</td>
</tr>
</tbody>
</table>

(Source: Partnership on measuring ICT for development. 2005)

### Indicators are only one part of the “measuring challenge”

An agreement among stakeholders on what to measure is a key first step. As the saying goes, “what you measure is what you get”. For Menou and Taylor, (2006: 261) measuring the information society must begin by addressing eight dimensions: ● definition of the universe to be measured; ● definition of the objects and phenomena to include in the universe; ● need to establish measurements based upon solid theories; ● units of measurements; ● data sources and collection; ● method of analysis and construction of indicators; ● target audiences; and ● purpose and utilization of measurements.
Examples of Internet Impact (expanded in Annex 1)

INDICATORS RELATED TO THE ENVIRONMENT FOR INTERNET USE
- Supportive Economy and Infrastructure
- Policy and Regulatory Environment

INDICATORS OF INTERNET SUPPLY
- Quantity of Internet Service
- Quality of Internet Service
- Sustainability

INDICATORS OF INTERNET USE
- Costs of Internet Use

INDICATORS OF IMPACTS ON FORMAL ORGANIZATIONS
- Perceived Benefits of the Internet
- Organizational Decision Making

INDICATORS OF SECTORAL IMPACTS
- Sectoral Use and Diffusion of the Internet

INTERNET IMPACTS ON SECTORS AND THEIR RELATED DEVELOPMENT GOALS
- Education
- Private Sector
- Government and Civil Society


Ways forward

Beyond the categories listed above, “core indicators” are available on-line from the Partnership on measuring ICT for development (2005a). There is no lack of indicators; for example on the overlap between Gender and ICTs there specific relevant resources (Grurumurthy, 2004; Moser, 2007); the is true with process indicators in communication (Figueroa et al., 2002). The challenge is less about the availability of indicators, and more about for who they are meaningful. We all see the potential of ICTs through our own ‘lenses’ and our own words. When stakeholders have the opportunity to explain their priorities, indicators can serve as a negotiation language to communicate the ideas and topics that matter to people. In this manner they can agree on what matters in terms of project objectives and to jointly explore those dimensions that are worth tracking (Ramirez, 2007).

Measuring change is part of a holistic challenge: “…in order to make the application of the tools meaningful for development, we…have to overcome five key challenges: ● we need to think about how we involve the right people; ● if the people we are trying to reach have access in terms of connectivity, ● infrastructure and language; ● if people actually will participate; how we structure and organise content; and finally, ● how we will measure the changes we have made. It is only when we use the afore-mentioned new tools with an approach to overcome the five challenges listed above that we will be able to further enhance development activities.” Chris Addison of Euforic, Web2forDev Conference, Rome, 25-27 Sep. 07 (our emphasis)


References


Annex 1
(National Research Council, 1998.)

INDICATORS RELATED TO THE ENVIRONMENT FOR INTERNET USE

Supportive Economy and Infrastructure

- GNP per capita
- number of telephones
- number of telephones per capita
- indicators of penetration of telephone service in rural areas
- indicators of penetration of electrical power in rural areas
- density of population in rural areas
- percentage of population in urban areas
- indicators of the strength of markets for personal computers, modems, and related technologies

Policy and Regulatory Environment

- estimated cost, time, and rate of success in establishing an ISP
- estimated cost, time, and rate of success in establishing an ISP account
- nondiscriminatory access to Internet service
- modem and/or computer tariff
- waiting time for a telephone line
- cost for installation of a telephone line
- waiting time for a leased line
- cost per minute to access points of presence (POPs)
- commercial availability of modems and computers
- local service for modems and computers

INDICATORS OF INTERNET SUPPLY

Quantity of Internet Service

- total number of ISPs
- total bandwidth to outside country (kilobytes/second)
- total number of modems connected to ISP servers for dial-up access
- total number of leased lines to customers
- total number of POPs
- total number of secondary-city POPs
- percentage of population within local calling area of POP
Quality of Internet Service

- percentage of send failures (messages that fail to reach their destination)
- average delivery time of e-mail/data transfer from each ISP to every ISP
- average delivery time of messages
- average time to check an empty mailbox
- mean connect speed of subscribers
- call failure rates for ISPs (the percentage of calls that fail to connect to the Web)
- number of members in an information industry association or ISP association
- number of ISPs offering full Internet service
- percentage of nonprofit ISPs
- number and percentage of profitable ISPs
- prices charged by ISPs for Internet access
- total funds invested by ISPs in expansion
- total ISP revenue

Sustainability

- number of foreign- and domestic-owned ISPs
- number of local technical staff
- number of ISPs offering user training
- number of institutions that monitor their own traffic, use, and number of hits on pages
- average number of years of schooling of adult population
- literacy rate
- number of information technology courses offered in universities
- average salary of Web designers and other ISP employees
- percentage of ISPs offering Web hosting, Web design, and other services
- ratio of national, regional, and international traffic to total traffic (both coming into and going out of the country)
- number of home pages on domestic servers
- ratio of national, regional, and international participation in listserves and news groups

INDICATORS OF INTERNET USE

- total number of subscribers by category of user
- average number of workstations per subscriber
- average number of people with access per workstation
- rate of change in the number of subscribers
- turnover rate
- total traffic (kilobytes per day)
- total connect time per day
• total number of e-mails per day
• average subscriber connect time
• average subscriber connections per day
• number of subscribers using leased lines

Internet use for:
• communication
• downloading software
• interactive discussions
• non-interactive discussions
• use of another computer
• real-time audio or video
• searches for product/service information
• purchases based on Web information
• searches for company/organization information
• searches for other information on the Web
• browsing/exploring
• seeing what is new at a favorite Web site
• business purposes
• percentage of users who connect from their own homes
• percentage of users who connect from an office
• percentage of users who connect from both home and office
• percentage of users who connect from an Internet cafe or business center

Costs of Internet Use

• price elasticity of demand
• fees paid to an ISP for leased-line, dial-up service, and other services
• installation fee(s)
• fees (fixed and/or usage dependent) paid to the telephone company
• price of a phone call per minute to connect with the ISP
• costs to the organization of Internet training courses and staff salaries paid during training

INDICATORS OF IMPACTS ON FORMAL ORGANIZATIONS

Perceived Benefits of the Internet

• number of messages/transactions to/from/by an organization per day that are domestic versus regional versus international in source or destination
• reported relative importance of the Internet versus other means
• cost savings on communications
• time savings on communications
• ratio of Internet to other channels in obtaining information
• percentage of an institution's dissemination through the Internet
• percentage of total public information made available through the Internet
• number of Web server hits or requests fulfilled per month from domestic versus regional versus international sources
• number of electronic newsletters or bulletins produced
• number of subscribers to newsletters and/or bulletins
• number and percentage of people trained in using the Internet
• number and percentage of subscribers with a LAN
• number of top/middle/lower-level users in an organization with access to the Internet
• relative importance placed on the Internet by top/middle/lower-level staff
• number of networks and "virtual organizations" of which an institution is a member
• investments in computer and other telecommunications facilities
• approximate number of users who (1) use e-mail, (2) "surf," (3) maintain own (individual or organization) home page, and (4) use an Intranet
• presence of a distinct information strategy as part of an organization's overall organizational strategies and plans

Organizational Decision Making

• change in number of people involved in an institution's decision making
• relative importance of the Internet versus other means of gathering data and information in decision making

INDICATORS OF SECTORAL IMPACTS

Sectoral Use and Diffusion of the Internet

• total number of subscribers per sector
• increase in the number of subscribers per sector
• percentage of Internet use per sector for (1) e-mail, (2) "surfing," (3) maintaining a (individual or organization) home page, and (4) use of an Intranet
• number of subscribers in primary city and secondary cities

INTERNET IMPACTS ON SECTORS AND THEIR RELATED DEVELOPMENT GOALS

Education

• number of schools/universities with Internet access
• number of students with Internet access
• average time of student access
• number of teachers with Internet access
• number of training courses on the Internet offered to teachers
• quality of training courses on the Internet offered to teachers (accreditation)
• number of new courses offered since the Internet was introduced
• number of schools/universities utilizing distance education via the Internet
• number of courses that supplement conventional teaching methods with distance education or other
• Internet-dependent technologies
• number of students enrolled in distance education
• number of non-university institutions offering distance education
• ratio of job placement of students with Internet experience/training in school to overall placement
• ratio of average starting salaries of individuals with Internet experience/training in school to overall starting salaries
• number of scholars/researchers attracted to a university/country (in part) because of Internet access

Private Sector

• rates of participation of African firms in international markets
• rates of participation of foreign firms in African markets
• numbers of Web pages providing information on a market
• numbers of persons communicating about a market on the Internet
• volume of transactions in a market using the Internet
• number (percentage) of chambers of commerce with Internet access
• number (percentage) of other business organizations with Internet access
• number of small and medium-sized enterprises with Internet access
• number of small and medium-sized enterprises posting products and prices on the Internet
• rate of change in the value of an enterprise's exports (imports) since acquiring Internet access
• rate of change in the value of a country's exports (imports) since acquiring Internet access
• rate of change in the value of a firm's exports since acquiring Internet access
• number of companies reporting growth since availability of the Internet
• number of firms engaged in electronic commerce
• value of sales via the Internet
• funds allocated by private companies to Internet-related training
• growth rates of private telecenters that provide Internet services

Government and Civil Society

• number of ministries/departments with a presence on the Web
• number of ministries/departments with e-mail reply addresses on the Web
• quality of Web site content in the above-described classes of Web sites
• percentage of ministries/departments who use it for dissemination of information about governmental actions or policies
• number of political parties with a presence on the Web
• Internet access to government policy papers and pending and existing legislation and regulations
• number of organizations using Internet networks, user groups, etc., to influence government
• number of list servers, news groups and conferences holding on-line discussions of public policy issues
• number of NGOs with Internet access
• number of publicly-available sites with free or low-cost Internet access, such as kiosks, post offices, community centers, or libraries
• number of independent sources of information and news provided via the Internet
• number of newspapers, radio stations, and TV stations using the Internet to collect news
• number of newspapers, radio stations, TV stations, and other media with Web sites
• percentage of domestic and foreign readers