Thirty-sixth session of the United Nations Statistical Commission
New York, 1 to 4 March 2005

Provisional agenda item 6: Activities not classified by field
Sub-item (f): Definition and measurement of the information society

"Information and Communication Technologies (ICT) Statistics"

Report by the Partnership on Measuring ICT for Development

Executive Summary

This paper gives an overview of progress made internationally as regards the collection of ICT statistical indicators, in particular in developing countries. It presents the efforts currently under way in the international community, under the umbrella of a global Partnership on Measuring ICT for Development, to agree on a common set of core ICT indicators to be collected by all countries, as a basis for developing internationally comparable ICT statistics.

The Commission may wish to:

a. Note the progress made internationally on ICT statistics
b. Comment on the future direction of the work of the Partnership.

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I. Introduction

1. During its thirty-fifth session, the Commission considered the issue of information and communication technologies statistics as part of the agenda item on economic statistics. After consideration of several documents, the Commission *inter alia* emphasized the need for a coordinated effort to further develop indicators on ICT, and expressed the need for capacity building in this area, in particular in developing countries.

2. This paper, which is a joint contribution of several international agencies involved in the statistical measurement of ICTs, presents an overview of work currently under way in the international community in the area of ICT statistics. It will first give a brief overview of the global Partnership on Measuring ICT for Development, its objectives and activities. It will then present the outcome of a global stocktaking exercise on official ICT statistics at the national level. This is followed by a discussion of core ICT indicators currently under consideration by the international community covering areas such as basic infrastructure and access, households, businesses, the ICT sector, and education. The paper concludes with suggestions on follow-up action that could be taken by the Commission.

II. Partnership on Measuring ICT for Development

3. Following the first phase of the World Summit on the Information Society (WSIS), held in Geneva in December 2003, a number of key international stakeholders involved in the statistical measurement of ICTs joined forces to create a global Partnership on Measuring ICT for Development. The Partnership was formally launched during the eleventh United Nations Conference on Trade and Development (UNCTAD XI), held in Sao Paulo, Brazil, in June 2004. Current partners include the International Telecommunications Union (ITU), the Organization for Economic Co-operation and Development (OECD), UNCTAD, UNESCO Institute for Statistics (UIS), four UN Regional Commissions (ECA, ECLAC, ESCAP, and ESCWA), the UN ICT Task Force and the World Bank. National statistics offices (NSOs) from statistically advanced countries are invited to contribute to the partnership activities and provide expertise and advice to NSOs from developing countries, and transfer knowledge in areas such as methodologies and survey programmes.

A. Objectives

4. The Partnership aims to accommodate and develop further the different initiatives regarding the availability and measurement of ICT indicators at the national, regional and international levels. It provides an open framework for coordinating ongoing and future activities, and for developing a coherent and structured approach to advancing the development of ICT indicators globally, and in particular in developing countries.

5. The objectives of the Partnership are: (i) to achieve a common set of core ICT indicators, to be harmonized and agreed upon internationally, which will constitute the basis for a database on ICT statistics; (ii) to enhance the capacities of NSOs in developing countries and build competence to develop statistical compilation programmes on the Information Society, based on internationally agreed upon indicators; and (iii) to develop a global database on ICT indicators and to make it available on the Internet.

B. Activities

6. Since its launch, the following activities were carried out under the umbrella of the Partnership:

7. A global stocktaking exercise on the status of information society statistics in NSOs was started in the summer of 2004. The outcomes of the exercise, carried out through a metadata questionnaire, are summarized in Section III, below.

8. Regional workshops, with the participation of NSOs, have been organized throughout the second half of 2004 in order to take into consideration the results of the stocktaking exercise and of e-measurement efforts in the regions. Workshops have taken place in Western Asia (Beirut, October 2004), Africa (Gaborone, October 2004), and Latin America and the Caribbean (Santiago de Chile, November 2004). The workshops identified regional priorities for action in the area of ICT indicators and produced regional lists of core indicators to be collected by countries.

9. A briefing for potential donors took place in Geneva in October 2004, to request support for Partnership activities, in particular through the financing of technical assistance activities necessary to help developing countries produce information society statistics. These capacity building activities include on-site training in NSOs, technical workshops at the regional level, the development of a training course on information society statistics, and the preparation of a guidebook on information society indicators.

10. A global WSIS Thematic Meeting on Measuring the Information Society will take place in Geneva under the umbrella of the Partnership (7-9 February 2005), to present the results of the global stocktaking exercise, to consolidate the outcomes of the regional workshops and to agree on a final list of core indicators. The meeting will also discuss developing country technical assistance needs as regards the compilation of ICT indicators, identify ICT indicators relevant to achieving the MDGs, and present ongoing work concerning the creation and maintenance of an international database on ICT indicators. The outcome will be presented as an input to the second phase of WSIS, to be held in Tunis in November 2005.

11. A second phase of the Partnership is envisaged from November 2005 to the first half of 2008. The objective of this second phase is to disseminate and expand the work on measuring ICT, thus increasing ICT data availability at the international level. This will be done by further developing the capacity building activities of the first phase and extending training programmes to new beneficiary countries. The international database on ICT indicators will be developed further. The outcomes of the General Assembly high-level plenary meeting on the MDGs (September 2005) and of WSIS Tunis (November 2005) will be incorporated in the planning of the second phase of the partnership project.

III. Global status of ICT statistics

12. In July 2004, a global stocktaking exercise on ICT indicators was initiated in different regions through a metadata questionnaire on the status of information society statistics, which was sent to NSOs in developing countries. The objectives of the exercise were to: (i) take inventory of existing and planned ICT indicators, questionnaires and methods of collecting statistics; (ii) collect information that could lead towards standardized definitions and a set of commonly accepted ICT core indicators; and (iii) identify best practices and needs of NSOs in

order to prepare technical assistance and knowledge exchange. The questionnaire was divided into four sections: general questions on ICT statistics; ICT statistics in household surveys; ICT statistics in business surveys; and ICT statistics in others sectors such as industry and trade, education or government.

13. The questionnaire was sent by ECA, ECLAC, ESCAP, and ESCWA to statistical offices in their member countries. UNCTAD sent the questionnaire to UNECE member countries not covered by the OECD or Eurostat. The results of the global stocktaking exercise are presented below. This is complemented by an overview of the status of information society statistics in OECD member countries.

A. Africa

14. Twenty-two out of 52 African countries replied to the questionnaire sent by the Economic Commission of Africa. The survey found that the majority of NSOs had no ICT definition. However, there was a demand for household ICT statistics in general, and a high demand for business ICT statistics in countries implementing an e-strategy, or having formulated a National Information and Communication Infrastructure (NICI) Plan. Existing collected ICT statistics concern mainly the presence of radio, TV, fixed and mobile telephony in households. Some countries address presence and usage of personal computers (PCs) and the Internet, and collect ICT statistics in business and other areas.

15. Publications are done in the majority of countries, and various financing mechanisms were available to support NSOs. However, there is a need for a harmonized methodology and a core set of ICT statistics to be collected. In this regard, the SCAN ICT methodology was found to be suitable for use by NSOs.[i] The proposed list of core ICT indicators for the African region is contained in annex 2.

B. Asia-Pacific

16. Seventeen out of 53 countries in Asia- Pacific replied to the metadata questionnaire. The survey found that almost half of the countries use a specific ICT definition. Three quarters of the NSOs finance the collection of ICT indicators through their regular budget, and a similar percentage of NSOs indicated that they produce publications about or containing ICT statistics.

17. Regarding ICT household indicators, 12 of the NSOs (70 per cent) responded that the level of demand is high or very high. The most common indicators are the presence of electricity, radio, fixed telephone, mobile phone, TV, computers and Internet.

18. Concerning ICT indicators collected through business surveys, slightly more than half of the NSOs indicated a high or very high demand for this type of statistics. The most common ICT business indicators are presence of fixed telephone and mobile devices, presence and number of computers, and Internet access.

C. Central Asia and selected European countries

19. Nineteen out of 24 countries replied to the questionnaire. Slightly more than half of respondents use a specific ICT definition; whereas 3 are still developing one and 6 do not use any ICT definition yet. Eleven countries (60 per cent) finance ICT data collection through

their regular budget, while 2 countries benefit from mostly Eurostat cooperation and 1 from national cooperation. One-fourth of countries indicated that they have not yet identified any sources of financing. Eight NSOs (42 per cent) indicated that they actively produce documents/publications that include ICT statistics.

20. Regarding ICT household indicators, 18 out of 19 countries have included ICT-related questions in their household surveys. Almost half of the countries responded that the level of demand for this type of statistics is high or very high. The most common indicators are the presence of electricity, radio, fixed telephone, mobile phone, TV and computers. The collection of household indicators concerning Internet use is less frequent, and eleven of the NSOs (60 per cent) do not plan to measure these indicators in the near future.

21. Twelve out of 19 countries have included ICT indicators in their business sector surveys (63 per cent). Eight countries (42 per cent) reported a high or medium level demand for ICT business indicators. Seven NSOs (37 per cent) did not indicate any level of demand. The most common ICT business indicators are presence of fixed telephone and mobile devices, presence and number of computers, and Internet access. Indicators related to electronic commerce are less collected. Two NSOs plan to develop collections of ICT indicators in business surveys in the next year and 3 NSOs plan to do so in the next 3 years. In one-fourth of the countries, national institutions other than the NSOs carry out business surveys that include ICT-related questions.

22. Finally, several countries collected ICT statistics in areas other than household and business. One-fourth of respondents collected ICT indicators related to education, 4 countries (21 per cent) collected indicators related to foreign trade, and others collected statistics specifically on the ICT sector. Twelve countries (63 per cent) do not collect ICT indicators in other sectors.

D. Latin America and the Caribbean

23. Twenty out of 36 countries replied to the questionnaire. The questionnaire found that 6 respondents (30 per cent) already use an ICT definition, while 3 are in the process of developing one. Concerning the sources of financing for the collection of ICT indicators, 14 of the NSOs (70 per cent) finance the collection out of their regular budget, and one-fourth benefit from national cooperation from other government institutions. Half of NSOs have published documents containing ICT statistics.

24. Thirteen of the NSOs in the region (65 per cent) reported high or medium level demand for ICT household indicators. All countries have included in their household surveys the questions about access to electricity, radio, fixed and mobile telephone, TV, computers and the Internet. Six countries have included questions about the use of ICTs in their household surveys, and 3 intend to do so in during the next three years. 3 countries have collected indicators related to barriers to Internet use and electronic commerce, while 4 countries will do so in the next three years.

25. Regarding ICT business indicators, 7 countries (35 per cent) of NSOs reported a high or medium level demand. Three countries reported a low demand. The most collected indicators are the presence of fixed telephone and mobile devices, presence and number of computers, and Internet access. One-fourth of countries include questions on Internet sales in their surveys.

26. It should be noted that the regional workshop held in November 2004 recommended the adoption by NSOs of a list of core ICT questions for regular surveys (see annex 3) and recognized the need to carry out specific thematic ICT surveys for households, businesses and other sectors of the economy, in order to gain a better understanding of the development of the Information Society in the region.

E. Western Asia

27. Ten of the 13 ESCWA member countries replied to the metadata questionnaire. It was found that 4 of the countries use an ICT definition, and 2 are in the process of developing one. One country does not use any specific definition and the remaining did not provide a response to this question.

28. Regarding ICT household statistics, more than half of the NSOs indicated a high or medium level of demand for this type of indicators. A similar level of demand was found for ICT business statistics. The most common ICT household indicators were presence of electricity, radio, fixed telephone, mobile phone, TV, computer and Internet.

29. The main ICT business indicators collected were the presence of fixed telephone and mobile devices, the presence and number of computers, the presence of Internet access and the types of services the Internet is used for. The remaining indicators are either not available or are planned to be collected in the next 3 years. The agreed regional list of core ICT indicators is contained in annex 4.

F. OECD members

30. Since 1997, OECD's work on ICT indicators is mainly carried out through its Working Party on Indicators for the Information Society (WPIIS), resulting in agreed definitions of the ICT sector, ICT goods and e-commerce. Furthermore, model questionnaires have been developed on the use of ICT by businesses and on the use of ICT by households/individuals. Currently, these model questionnaires are under revision. Other work underway includes the development of a definition of ICT services, and measuring various complex items such as e-business processes, digital content, IT security, e-government services, etc. Work on assessing the impacts of ICT has been carried out over the last few years, mainly by the member countries themselves, with the Secretariat trying to consolidate the country level findings at the international level. This work will be continued and is expected to assume a more important role in years to come.

31. ICT statistical data from OECD member countries are collected annually and published in various publications, most importantly in the *OECD Science, Technology and Industry Scoreboard*. This publication combines methodological explanations of the indicators with empirical analyses of the findings.

32. Indicators on the usage of ICT by households and individuals have been collected since 2001, with data available for 17 countries in 2001, up to 20 in 2003. The data request for the 2005 edition of the Scoreboard asks for data available for all EU countries and some non-EU OECD countries. Priority indicators that will be collected are households with access to a computer, to the Internet and to broadband, individuals using the Internet, placing online orders, and encountering security problems and other barriers on the Internet. In addition, data

will be requested on the location of individual Internet use, on the proportion of employees persons using the Internet at work, on the proportion of students using the Internet at their place of education, and on other activities carried out over the Internet by individuals.

33. Business usage indicators have been collected since 2001 as well, with the country coverage rapidly increasing from 7 countries in 2001 to 21 in 2003. The data request for the 2005 Scoreboard will as a first priority ask for businesses using the Internet, with broadband access, with a Web site or home page, having particular IT security measures in place, encountering specific IT security problems, placing and receiving orders over the Internet, value of Internet orders and of orders received over other (non Internet) computer mediated networks. Additionally, lower priority data will be requested on businesses' use of computers, carrying out specific businesses processes over the Internet, using Internet e-mail, intranet, extranet or LAN, placing orders using other (non Internet) computer mediated networks, share of Internet sales to households/individuals, receiving orders using other (non Internet) computer mediated networks, and recognising specific benefits and limitations to Internet use for receiving orders. Data availability for these indicators is expected to be above 20 countries.

34. Since 2000, OECD has been collecting data for the ICT sector (employment in the ICT sector, value added generated by the ICT sector, production value of the ICT sector, etc.) from its member countries, with data generally available for most of the 30 OECD countries. More and more, these data are available from other sources, such as national accounts and structural business surveys, and there may no longer be the need for a separate data collection.

35. The metadata information on ICT statistics for OECD member countries will be included in Annex 3 of a forthcoming *Guide to Information Society Measurement*, to be finalised in the second half of 2005. Countries will be asked to complete the metadata questionnaire by mid January 2005 and the results of the collection will be available by the end of April 2005. The collected information would be updated annually.

IV. Core ICT indicators

36. One of the main objectives of the Partnership is to define a set of core ICT indicators, which would be agreed upon by all countries and harmonized at the international level. The results of the metadata survey provide important inputs to this exercise, as they help identify what countries currently consider as basic ICT indicators.

37. This section presents a number of basic ICT statistical indicators which are currently being debated at the national, regional and international levels, necessary to measure ICT readiness and usage by individuals, households, businesses, and schools. The objective of the discussion is to agree on a common set of core ICT indicators to be collected by all countries, which would constitute the basis for an internationally comparable database on ICT statistics.

38. The following discussion primarily focuses on indicators related to basic ICT access and usage by households, individuals and businesses. This is because (i) individuals, households and businesses are key players in an information society, and (ii) there is an emerging consensus on definitions, guidelines and methodologies regarding individual, household and business ICT indicators, as reflected in various national, regional and international initiatives. For example, OECD and Eurostat have developed model household and business surveys. On

the other hand, little progress has been made on other ICT-related indicators, such as government or health. The latter will thus be dealt with subsequently.

A. Basic infrastructure, access and household indicators

39. Indicators on individual and household ICT access, use and ownership have important policy implications, helping governments to assess the status of ICTs by geography, population segment, or economic sector, to identify needs and priorities in ICT-related policies, to benchmark those policies or to measure their impact. Basic infrastructure and access indicators are collected annually by the ITU and measured *per capita* (see annex 1). They are defined and discussed during the World Telecommunication Indicators (WTI) meeting and are published in the ITU Handbook of Telecommunication Indicators.

40. Furthermore, indicators of community/public access are particularly relevant for developing and least developed countries, where individual or household access to telephones, PCs and the Internet is still far from universal (see annex 2). Mobile cellular coverage is another way of measuring access (percentage of the population that is covered by a mobile cellular signal regardless of subscription).

41. Some NSOs collect data for household and particularly individual access to ICTs; in 2003, around 50 countries (primarily developed and emerging nations) carried out individual Internet user surveys. The OECD and Eurostat regularly publish data and definitions for indicators on household and individual use. However, there is scarce reliable information about ICT use in developing nations and particularly in the least developed countries.

42. To begin with, access to radio and television broadcasting in developing countries is predominant and far higher than access to other ICTs. Therefore, it is important to compile indicators on access to broadcast networks (see annex 1). Other key indicators are access to telephone service (both fixed and lines), to PCs and to the Internet. Indicators on access to PCs should include the number of people that use a computer and the percentage of households with a computer (this could also give an indication of basic computer skills).

43. Furthermore, indicators of access to the Internet are the basis of discussions on the digital divide, including the percentage of households with Internet access and the number of individuals that use the Internet. The latter indicators can be disaggregated further by: age, frequency of use, type of access devices used, location of use and purpose of Internet use. However, to ensure comparability of data, there should be an agreement on the definition of user age (for example, by showing Internet use from a common starting age and with uniform age cohorts)[ii], of frequency of use (within the last year, within the last three months, monthly, weekly or daily), and of type of access devices (computer, Internet-enabled mobile phone, Internet-enabled TV sets, etc.).

44. With regards to the disaggregation of Internet access data according to location of use, the vast majority of households in developing countries do not have PCs or Internet access, and many users rely on other points of access (other households, at work, at school, Internet cafés, etc.). Therefore, indicators that show the location of use of Internet have also been proposed. Similarly, data should be disaggregated according to the purpose of Internet use (communication, information search, electronic commerce, interaction with public authorities, training and education, health purposes, etc.).

45. Data on ICT use can be cross-correlated with other data collected such as income, gender, education and other characteristics of the head of household, in order to enhance the analysis of national digital divides. Furthermore, electricity is a large barrier to ICT development in a number of developing nations, since the lack of a suitable energy source impacts the ability to use ICTs. In this regard, an associated household indicator on access to electricity could be useful when collecting data on ICTs.[iii]

B. Enterprise / ICT sector

46. Statistics on the access to and use of ICTs by businesses and on the ICT sector are important for a number of reasons. Firstly, these statistics allow policy makers to monitor information society developments and to participate effectively in related international debates, such as in the context of WSIS, or of WTO negotiations. ICT statistics enable researchers to analyse ICT developments and to inform policy makers about trends and, most importantly, the impact of ICTs on economic and social development. Finally, business people require reliable data upon which to base investment and strategic decisions.

47. Official ICT business data is readily available in developed countries, while it is still scarce in developing countries. Although some developing countries are already collecting some official ICT business data as part of business surveys (see section III), few perform specific surveys on the access to and use of ICT by businesses. For example, most statistical data on e-commerce are available from private providers; definitions and methodologies differ and are thus not comparable. Collection is often performed on an ad-hoc basis, and estimates and forecasts can be unreliable. Furthermore, other ICT business indicators on e-business usage, barriers, and impact are practically non-existent.

48. ICT business indicators should measure general access and usage of ICT (for example, number of businesses with computers, Internet access), e-commerce (online sales and purchases), and e-business. Core ICT business indicators should be basic, business-relevant, policy-relevant, and feasible to collect by NSOs from developing countries. Therefore, the proposed list of core ICT business indicators includes a number of ICT readiness indicators (such as use of PCs and the Internet and by how many employees, presence of a website, an intranet or an extranet), and at least two indicators on usage (online sales and purchases).

49. Indicators related to the ICT sector, which is defined by the International Standard Industrial Classification (ISIC) Rev. 3, can be considered separately from other business indicators (see annexes 1, 2 and 4). ICT sector data is relevant to determine the relevance of the sector to national ICT policies, as well as the value of the sector to the economy. In some developing countries, notably those in which the ICT sector has become a strategic component of economic development (for example, Costa Rica, India, Malaysia, the Philippines, and Singapore), such data is paramount.

50. Core indicators on the ICT sector (see annexes 2 and 4) refer to the sector's value to overall trade and to value added, and to the relevance of the ICT sector to employment, disaggregated by gender. For NSOs in developing countries, it should be feasible to collect data on core indicators related to the ICT sector through industry-specific surveys or from governmental administrative sources (private sources are not recommended). In addition to these, OECD proposes core indicators on the production value of the ICT sector, on growth and on ICT patents, which are likely to be collected by statistically more advanced countries (see annex 1).

C. Education

51. The ongoing international debate on ICT indicators has identified specific core indicators related to education (see annexes 2 and 4) and has addressed the question of ICT use for educational purposes in household surveys (see annexes 1 and 3). Core indicators should measure the student to computer ratio in primary and secondary schools, the percentage of schools having Internet access for students, or the percentage of students enrolled in tertiary education in an ICT field. Further ICT indicators related to education could be a part of supplementary indicators to be collected at another level.

V. Supplementary indicators

52. Apart from a limited list of core ICT indicators, some countries, notably those more advanced in the collection of ICT indicators, may want to collect additional statistical indicators related to measuring the information society. In the area of household surveys, these indicators could cover barriers to Internet access, frequency of use or value of Internet purchases by individuals. In the area of business surveys, they could cover questions related to ICT investments, specific e-business processes, or barriers to ICT usage. Supplementary indicators could also extend to other sectors covering such areas as government, financial institutions, the health sector, and others.

VI. Conclusion and way forward

53. This paper gave a brief overview of progress made internationally as regards the collection of ICT statistical indicators, in particular in developing countries. It also presented the efforts currently under way in the international community to agree on a common set of core ICT indicators, as a basis for developing internationally comparable ICT statistics. The work carried out by different international organisations, brought together under the framework of the global Partnership on Measuring ICT for Development, will continue during the course of 2005. The outcomes of the global stocktaking exercise will be consolidated at the global WSIS Thematic Meeting on Measuring the Information Society, to be held in Geneva on 7-9 February 2005. The meeting will identify priority areas for action and will agree on a final list of core ICT indicators, taking into consideration the discussions on core indicators that took place at the regional level. The outcome of the meeting and the results of Partnership activities to date will be brought to the attention of policy makers attending the second phase of the WSIS in Tunis (November 2005) and of the thirty-seventh session of the Commission in 2006.

VII. Points for discussion by the Commission

54. The Commission may wish to:

(a) Note the progress made internationally on ICT statistics;
(b) Comment on the future direction of the work of the Partnership.

Annex 1: OECD, proposed list of core ICT indicators

Source: http://www.oecd.org/dataoecd/3/3/22453185.pdf

Readiness indicator: Infrastructure

Indicators:	*Indicators available in the ITU database (available for many countries):* • Main fixed telephone lines per 100 inhabitants • Total telephone subscribers per 100 inhabitants • Cellular phone subscribers per 100 inhabitants • Number of personal computers per 100 inhabitants • Number of Internet users per 100 inhabitants • Residential monthly telephone subscription cost • Cellular monthly subscription cost • Business telephone monthly subscription cost *Indicator available through the Internet Software Consortium (ISC) (available for many countries):* • Number of Internet hosts *Other indicators (to be collected from national sources or private sources):* • Internet subscribers per 100 inhabitants • Web sites per 1 000 inhabitants • Internet access costs
Sources:	• National telecommunication authorities (data collected by ITU) • ISP surveys • Surveys of telecom carriers • Private sources (e.g. netsizer, netcraft)

Readiness indicator: Trade

Variables:	• Value of imports and exports of ICT goods • Value of total imports and exports
Indicators:	• ICT sector trade balance (defined by the OECD as ICT exports minus ICT imports divided by total manufacturing trade (the average of exports and imports)) • Growth rate of ICT imports • Growth rate of ICT exports • ICT imports as a % of total imports • ICT exports as a % of total exports
Classification:	Harmonized System (HS) rev. 1 (for list of ICT goods, see annex)
Sources:	Trade databases, such as the UN's COMTRADE database

Readiness indicator: Qualifications

Indicators:	• Proportion of population with completed secondary education • Proportion of population with completed tertiary education • Enrolment ratios in primary, secondary and tertiary education • Proportion of enrolments in higher education in an ICT field of study (as a % of total number of enrolments and as a % of the corresponding age

	group) • Proportion of graduates in higher education in an ICT field of study (as a % of total number of graduates and as a % of the corresponding age group)
Classification:	ISCED 97; ICT field of study is ISCED field 48: Computing
Sources:	• UNESCO • National education statistics

ICT supply and use indicators: The ICT sector

Variables:	• Production value • Value added • Employment
Indicators:	• Contribution of value added in the ICT sector to total business sector value added • Growth of value added in the ICT sector • Contribution of employment in the ICT sector to total business sector employment • Growth of employment in the ICT sector • Contribution of production value in the ICT sector to total business sector production value • Growth of production value in the ICT sector
Classification:	ISIC Rev. 3; if possible data broken down by: • ICT manufacturing • ICT services • Total manufacturing • Total services • Total business sector
Sources:	• Business survey data (detailed enough to allow for measurement of the ICT sector, see annex for details) • Administrative sources • Private sources (not recommended)

ICT supply and use indicators: Households' and individuals' readiness and use of ICT

Indicators:	• Proportion of households with access to a home computer (% of total) • Proportion of households with access to the Internet (% of total) • Proportion of individuals (aged 16+) accessing the Internet from the following locations: - Home - Internet cafe or similar - Work - Other - Place of education • Proportion of individuals (aged 16+) using the Internet for the following activities: - Using e-mail/chat rooms - Finding information about goods and services - Getting information from/interacting with government - Finding health related information - Reading/downloading online newspapers/news magazines - Playing/downloading games, music, software

	- Using banking or other financial services - Purchasing/ordering goods or services - Education activities - Other
Classification:	• Households broken down by composition (couple, couple with children, one-parent family, other family, lone person, other non-family) • Individuals broken down by gender • Individuals broken down by age-group (16-24, 25-44, 45-64, 65-74) • Individuals broken down by highest education received (primary, secondary, postsecondary (not tertiary), tertiary)
Sources:	• General population surveys • Specific ICT surveys • Private sources

ICT supply and use indicators: Businesses' readiness and use of ICT

Indicators:	• Proportion of businesses with PCs (% of total) • Proportion of employees using PCs (% of total) • Proportion of businesses with Internet access (% of total) • Proportion of businesses accessing the Internet by the following modes of access: - Analogue modem - Mobile phone - ISDN - WiFi - DSL - Other • Proportion of employees using the Internet (% of total) • Proportion of businesses with a website (% of total) • Proportion of businesses receiving orders over the Internet (% of total) • Value of orders received over the Internet (% of annual revenue) • Proportion of businesses placing orders over the Internet (% of total)
Classification:	• Enterprises broken down by activity/industry (at the 2-digit level of ISIC Rev. 3) • Enterprises broken down by size-class (size-classes: 0, 1-9, 10-49, 50-249, 250+ employees)
Sources:	• General business surveys • Special ICT use and/or e-commerce surveys • Private sources

ICT supply and use indicators: Patents

Variables:	• Number of ICT patents • Total number of patents
Indicators:	• ICT patents as a % of total patents • ICT patents as a % of world total of ICT patents • Growth of ICT patents
Classification:	International Patent Classification (IPC)
Sources:	EPO, USPTO, JPO, other (national) patent offices using the IPC

Annex 2: Africa, list of core ICT indicators

Source: ECA, Regional workshop on ICT indicators, 26-29 October 2004

Indicators

Basic infrastructure and access

1. Main telephone lines per 100 inhabitants
2. Mobile cellular subscribers per 100 inhabitants
3. Radio per 100 inhabitants
4. Television sets per 100 inhabitants
5. Number of PCs per 100 inhabitants
6. Number of Internet subscribers per 100 inhabitants
7. Percentage of localities with public Internet access centers (PIACs) by number of inhabitants (rural/urban)
8. Percentage of population with access to PIACs by type of PIAC (governmental/private)
9. Percentage of population covered by mobile telephony

ICT sector

10. Percentage of total workforce involved in ICT sector (by gender)
11. ICT imports and exports as percentage of total imports and exports
12. Value added in the ICT sector (as a percentage of total value added)

Households

13. Percentage of households with radio
14. Percentage of households with a television
15. Percentage of households with a telephone (Fixed only, mobile only, fixed and mobile)
16. Percentage of households with a personal computer
17. Percentage of households with Internet access (from the home)

Individuals (by age, gender, including the disable)

18. Percentage of population that use a computer
19. Percentage of population with access to the Internet (by type of access, purpose, location of use)

Business

20. Percentage of businesses with computers
21. Percentage of businesses with Internet access
22. Percentage of businesses with a website
23. Percentage of employees using PCs
24. Percentage of employees using the Internet
25. Percentage of businesses receiving orders over Internet
26. Percentage of businesses placing orders over Internet
27. Percentage of businesses with an intranet

28. Value of orders received over the Internet (as a percentage of total value of orders)

Education

29. Percentage of students enrolled in tertiary education having Internet access for students for study purposes
30. Enrolled Student to PC ratio (in primary, secondary schools and tertiary education)
31. Percentage of students enrolled in tertiary education in an ICT field or an ICT-dominated field (of the total number of students) (by gender)
32. Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers)
33. Percentage of tertiary education institutions with e-learning courses (of the total number of tertiary education institutions)
34. For what purpose do students/teachers use computers/Internet (% for E-mail, research, employment opportunities, application software, etc.)

Government

35. Ratio of availability of PCs to number of staff
36. Percentage of government offices with Internet access
37. Percentage of government offices and agencies with a website
38. Percentage of government employees with Internet access from the office
39. Percentage of government workers that use ICTs
40. Purpose of use: (per cent) for e-mail, research, database work, geomatics, application software, etc

Agriculture

41. Percentage of agricultural population and extension workers involved in the exploitation and deployment of ICTs to the sector
42. Typology of usage of ICTs in the agricultural sector (per cent in research and development, business, weather, prices, etc.)
43. Number of local web-sites and data bases with agricultural information and content

Health

44. Percentage of health institutions using ICTs (by type of health institution: private clinic, government, university hospital, pharmacy etc…)
45. Geographic distribution of health institutions with computers, telephone and Internet connectivity
46. Percentage of health professionals that use ICTs for medical purposes
47. Purpose of usage and % in tele-medicine, e-mail, research (health information, continuing medical education or distance learning, health promotion (including health information systems), database, Software applications, etc
48. Percentage of local web-sites and data bases with medical information

Annex 3: Latin America and the Caribbean, list of core ICT questions

Source: ECLAC, Workshop on Information Society Measurement for Latin America and the Caribbean, 3-4 November 2004

8 Core Questions for regular household surveys		Response Options	Criteria		
			Intern. Reference	LAC Reference	Observed Unit
H-1	Does this household have a fixed line telephone?	Yes No	C, E, O	ALL (20)	Household
H-2a	Does this household have a mobile telephone?	Yes No	A, C, O	19	Household
H-2b	How many members of the household have access to a mobile phone?	Number	-	-	Household
H-3	Does this household have TV?	Yes No	-	19	Household
H-4	Does this household have a computer (PC)?	Yes No	A, C, O, *ES*	ALL (20)	Household
H-5	Does this household have an Internet access at home?	Yes No	A, C, E, O, *ES*	ALL (20)	Household
H-6	Where did you use the Internet most frequently in the last 3 months? *(tick all that apply)*	Did not access At Home At Work Educational Facility Free public access center (specific denomination depends on national practices) Commercial public access center (specific denomination depends on national practices) House of friend or neighbor Others	C, E, O, *ES*	Bb, Cl, Co, Cr, Mx, TT	Individual(s) of the household[iv]
H-7a	How often did you usually access the Internet in the last 3 months? *(tick one)*	At least once a day At least once a week, but not every day At least once a month, but not every week Less than once a month Do not know	C, E, O, *ES*	Bb, Co, Mx, TT	Individual(s) of the household that use the Internet[iv]
H-7b	How many hours did you usually access the Internet weekly over the last 3 months?	Number of hours per week Do not know	-	-	Individual(s) of the household that use the Internet[iv]
H-8	For what services/activities did you use the Internet in the last 3 months? *(tick all that apply)*	Communication (e-mail, chat) Information search Purchasing/ordering goods or services Health related activities	A, C, E, O, *ES*	Bb, Cl, Co, Cr, Mx, TT	Individual(s) of the household that use the Internet[iv]

		Education, research and related activities Transactions with public authorities Using electronic banking or other financial services Reading/downloading online newspapers/news magazines Playing/downloading games, music, software Other			

5 Core Questions for regular business surveys[v]		**Response Options**	**Criteria**		
			Intern. Reference	**LAC Reference**	**Observed Unit**
B-1	How many computers does the enterprise have?	None Number Do not know	C	Cl, Co, Pe, TT	Enterprise
B-2	Does the enterprise use one of the following networks? *(tick all that apply)*	Internet Intranet Extranet LAN WAN	A, C, E, O, *ES*	Ar, Bb, Br, Bz, Cl, Co, Cr, Mx, Pa, Pe, S, TT, Uy	Enterprise
B-3	Does the enterprise have a website?	Yes No In construction	A, C, E, O, *ES*	Ar, Bb, Br, Cl, Co, Mx, Pe, TT, Uy	Enterprise
B-4	What is the share of the total number of employees using a computer connected to the Internet in their normal work routine?	% of total employees Do not know	C, E, O, *ES*	Ar, Cl, Co, TT, Uy	Enterprise with Internet access
B-5	What services/activities does the enterprise use the Internet for [external focus]? *(tick all that apply)*	Communication (e-mail, chat) Information search Placing orders Receiving orders Financial and banking services Transactions with public authorities Marketing or client support Education, research or training Other	C, E, O, *ES*	Cl, Co, Pe, TT	Enterprise with Internet access

Annex 4: Western Asia, list of core ICT indicators

Source: ESCWA, Roundtable on Information Society Indicators and Profiles in Western Asia, 4-5 October 2004

	CORE INDICATORS		Available	Possible sources
READINESS	**Basic infrastructure and access**			
	1	Main fixed telephone lines per 100 inhabitants	ITU	
	2	Mobile telephone subscribers per 100 inhabitants	ITU	
	3	Residential fixed line telephone monthly subscription costs	ITU	
	4	Local fixed line call costs for three minutes	ITU	
	5	Business telephone monthly subscription costs	ITU	
	6	Mobile telephone subscription costs	ITU	
	7	Local mobile call costs for three minutes	ITU	
	8	Televisions per 100 inhabitants	ITU/UIS	
	9	Number of PCs per 100 inhabitants	ITU	
	10	Internet hosts per 10,000 inhabitants	ITU/ISC	
	11	Number of Internet subscribers per 100 inhabitants		ISP surveys
	12	International bandwidth per capita	ITU	
	13	Broadband Internet subscribers per 1000 inhabitants	ITU	
	ICT sector			
	14	Percentage of total workforce involved in ICT sector (broken down by gender)		Business surveys
	15	ICT imports and exports as percentage of total imports and exports	Trade databases (UN COMTRADE)	
	16	Value added in the ICT sector (as a percentage of total value added)		Business surveys
INTENSITY (USAGE)	**Household**			
	17	Household Internet access cost per month	ITU	
	18	Percentage of households with Internet access		Household surveys/ census
	19	Households with a PC		Household surveys/ census
	20	Individuals accessing the Internet by primary access point (broken down by age and gender)		Household surveys/ census
	21	Individuals using the Internet by activity		Household surveys/ census
	Business			
	22	Percentage of businesses with PCs		Business surveys

	23	Percentage of businesses with Internet access		Business surveys
	24	Percentage of businesses with a website		Business surveys
	25	Percentage of employees using PCs		Business surveys
	26	Percentage of employees using the Internet		Business surveys
	27	Percentage of businesses receiving orders over Internet		Business surveys
	28	Percentage of businesses placing orders over Internet		Business surveys
	29	Percentage of businesses with an intranet		Business surveys
	30	Value of orders received over the Internet (as a percentage of total value of orders)		Business surveys
	Education			
	31	Enrolled Student to PC ratio in primary and secondary schools		Ministry of Education
	32	Percentage of primary and secondary schools having Internet access for students for study purposes		Ministry of Education
	33	Percentage of students enrolled in tertiary education in an ICT field or an ICT- dominated field (of the total number of students) (broken down by gender)	UIS database	Ministry of Higher Education
	34	Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers)		Ministry of Education
	35	Percentage of tertiary education institutions with e-learning courses (of the total number of tertiary education institutions)		Ministry of Higher Education

Endnotes

[i] Scan-ICT is an initiative of the United Nations Economic Commission for Africa (ECA), the International Development Research Centre (IDRC) Acacia initiative, the European Union and the Norwegian Agency for Development Cooperation (NORAD), that aims to build support for the phased development of a comprehensive African capability to collect and manage key information needed to support the growing investment in ICT as well as the transition of Africa to an information society. For further information, see http://www.uneca.org/aisi/scanict.htm.

[ii] For example the United States data shows data in five age groups (3-8, 9-17, 18-24, 25-49 and 50+), Republic of Korea data shows data broken down by 6-19, 20s, 30s, 40s and 50 and over while European data is broken down into four groupings: 15-24, 25-39, 40-54 and 55+.

[iii] Data from developing countries suggest that while radio ownership is roughly equally distributed between rural and urban areas, there is a significant gap for television, mainly attributable to the more limited availability of electricity in rural areas. "Lack of access to electrical energy in rural areas deprives communities ... of … television, which are essential ways of disseminating information on general development concerns." http://tcdc.undp.org/experiences/vol8/Zimbabwe.pdf

[iv] Regarding methodological implementation, the method of selecting the individual(s) in the household needs to be considered.

[v] In accordance with point 1b and 4 of the foregone conclusions, specific thematic surveys are of special interest for the business sector.