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Final Report

1. The 7th World Telecommunication/ICT Indicators Meeting (WTIM-09), organized by the International Telecommunication Union (ITU) and hosted by the Ministry of Communication and Information Technology (MCIT) of the Government of Egypt, took place in Cairo from 3 to 5 March 2009.
2. The Meeting attracted 386 participants from 94 Member States, 57 public and private companies and 12 regional and international organizations.
3. The work of WTIM-09 was conducted under the chairmanship of Dr Nagwa Al-Shenawy, Director of the Information Centre at the Ministry of Communication & Information Technology of Egypt. The sessions were moderated by selected experts of MCIT Egypt.
4. WTIM-09 was officially opened by His Excellency Mr Tarek Kamel, Minister of Communication and Information Technology (MCIT). Also took part in the opening session, H.E. Mr Othman Mohamed Othman, Minister of State for Economic Development, Mr Sami Al-Basheer, Director, Telecommunication Development Bureau (BDT) of the ITU, and Mr Mario Maniewicz, Chief, Policy and Strategy Department, BDT of the ITU.
5. The meeting focused on six main topics: Infrastructure and Access Indicators, Benchmarking the Information Society, ICT Household Statistics (including capacity building on ICT statistics), and Measuring the Impact of ICT on Employment. It also reviewed global and regional progress on ICT measurement.
6. This report summarizes the presentations and discussions of each session and presents the main conclusions and recommendations of the meeting. Further information, such as the agenda, the presentation slides, and the list of participants is available on <http://www.itu.int/ITU-D/ict/wict09/index.html>.

ICT Infrastructure and Access Indicators

7. The session started with a presentation by the ITU on the *Revision of ICT Infrastructure and Access Indicators* which highlighted the need to update the list of ITU telecommunication indicators as well as their definitions. The main objectives are to facilitate the data collection in countries, to simplify the definitions of certain indicators, and to reduce the number of indicators included in the ITU "long" questionnaire. The presentation further highlighted the challenges in collecting telecommunication data from countries due to differences in the definition of indicators. The issue of mobile cellular subscribers was cited as an example, where the current definition does not reflect the actual data that are collected from countries. It was suggested to change "subscribers" to "subscriptions" in order to take into account multiple accounts or SIM cards owned by a subscriber. In order for the definitions to better reflect the views and experiences of countries with regard to the different indicators, the ITU proposed that an Expert Group be set up to work on the revisions of the indicators with the aim of finalizing the list of indicators and their definitions before the first quarter of 2010. The Expert Group, to meet through online discussions and eventually in person, will be open to all ITU members as well as invited experts, engineers, statisticians and analysts who are familiar with the technologies, the services, and the indicators needed to measure them. The creation of the Expert Group was endorsed by the meeting on the understanding that the terms of reference will clearly state the tasks to be performed as well as the duration of the Group's mandate. The meeting suggested using the resulting list of indicators and definitions in the ITU's 2010 "long" data collection.
8. The session also addressed the topic of mobile broadband indicators with presentations by the OECD Secretariat and Japan.
9. The presentation by the OECD on *Developing mobile/wireless broadband indicators* highlighted the issues and challenges related to measuring mobile broadband. When the OECD started collecting fixed broadband statistics in 2002, 3G mobile subscriptions were not included in the data collection. This was due to the difficulty in obtaining accurate data as a result of inactive subscriptions, the multitude of devices used (modems, handsets) and contention ratios. Therefore, it was decided not to combine fixed broadband and mobile broadband into a single indicator. In order to exclude inactive mobile subscriptions, the OECD expert group working on mobile broadband indicators, suggested that usage is mandatory for a subscriber to be counted. The OECD therefore decided on a methodology that would factor in all these considerations and would proceed according to the following three steps:
 1. collect total mobile broadband subscriptions
 2. consider active subscriptions only (those mobile/SIMs that have been used to access the Internet during the last three months)
 3. look at the number of active mobile subscriptions dedicated to data (subscriber who has paid the service to access data and transferred an IP address between a device and a mobile network)
10. In addition to subscriptions, mobile broadband prices are another interesting area to be measured. Results from a recent OECD survey showed that most operators do not report on speed but differentiate prices into data caps. In countries such as Australia, Portugal or Austria, the survey showed that mobile broadband has similar prices and speed to those of fixed telephone lines while in other countries, such as France, broadband is considered as a complementary service resulting in lower bit caps. This is why the OECD now measures prices using three baskets with different methodologies (mobile and fixed broadband, and fixed telephone lines).
11. Japan's presentation entitled *Experience and Challenges in Collecting Mobile Broadband Statistics in Japan* highlighted the increase in the number of mobile subscriptions and a decline in the number of fixed telephone lines in Japan. At the same time, it showed that broadband prices, particularly DSL, have dropped considerably during the past years.

Despite cheaper access, one problem that remains is how to extend the benefits of broadband services to "zero" zones, i.e. areas where there is no service available.

12. Another problem in measuring mobile broadband access concerns the rapid growth of a wide range of new technologies and the task of collecting data on their use. For example, in Japan, mobile broadband statistics cover IMT-2000 (3G and 3G+) technologies, Wireless LANs, Wimax or Next Generation PHS. When considering the evolutionary path from 3G to 3.5G to 3.9G and the underlying mobile technologies represented by long-term Evolution or Ultra Mobile Broadband, one can grasp the challenge of collecting mobile broadband statistics.
13. In considering ways to benchmarking changes in ICT access, Japan reported on a study made in 23 OECD countries where a number of indicators were examined.
14. In the discussion that followed, participants stressed the importance of including mobile prepaid subscriptions in the measurement of mobile broadband and mobile broadband pricing, because prepaid service is a key strategy to improve access in developing countries. Furthermore, the issue of convergence of technologies was raised and the need to examine its impact on the definition of indicators.

Benchmarking the Information Society

15. The session on Benchmarking the Information Society started with a presentation of the new *ITU ICT Development Index (IDI)* launched just before the WTIM-09. The presentation covered the background to the development of a single index, the methodology of the IDI, as well as the main findings. The main objectives of the IDI are to reflect developments over a period of time, to be global, to duly reflect the different levels of development, and to measure the digital divide while tracking components that can be used to measure whether ICTs are used effectively. The IDI includes 11 indicators covering ICT access, use and skills. It was completed at the end of 2008 for 154 economies, using both the 2002 and 2007 data series. The 154 economies included in the IDI analysis account for 97% of the world's population.
16. The most advanced countries in ICT are from Northern Europe, with the exception of the Republic of Korea. Sweden tops the IDI, followed by the Republic of Korea, Denmark, the Netherlands, Iceland and Norway. They are followed by other, mainly high-income countries from Europe, Asia and North America. Western and Northern Europe and North America are the regions with the highest IDI scores, and most countries from these regions are among the top twenty ICT economies. Poor countries, in particular the least developed countries, remain at the lower end of the index with limited access to ICT infrastructure, including fixed and mobile telephony, Internet and broadband.
17. All countries have improved their ICT levels during the past five years, but some much more than others. Eastern Europe not only features high relative growth but also one of the highest IDI value gains and can thus be considered as the most dynamic region on ICT developments during this time period. Countries that were driving this process include the Baltic States and Romania. Other economies that have significantly improved their ICT levels are Luxembourg, the United Arab Emirates, Ireland, Macao (China), Japan, Italy and France.
18. Some developing countries, though, have moved up considerably in the Index over the five-year period, including Pakistan, Saudi Arabia, China and Viet Nam. This is partly due to high mobile cellular growth, coupled with an increase in Internet users.
19. Both developed and developing countries have increased their ICT levels by more than 30 per cent over the five-year period, but developing countries are still lagging behind on ICT access and usage. A comparison of ICT levels and Gross National Income (GNI) per capita (at purchasing power parity) shows a strong link between income and ICT uptake.

20. One of the main objectives of the IDI is to measure the magnitude and evolution of the global digital divide. Based on the concept that the digital divide is “relative” — meaning that it compares ICT developments in one country with those in another country — the ITU Report shows that, overall, the magnitude of the global digital divide remained unchanged between 2002 and 2007. Despite significant improvements in the developing world, the gap between the ICT haves and have-nots remains.
21. The second part of the publication presents the new ICT Price Basket and examines, among other things, the relationship between ICT prices and IDI levels. ICT prices are used to show, in different parts of the world, the affordability of services. They allow policy makers to evaluate the cost and affordability of ICTs in their countries and, therefore, illustrate the importance of ICT prices for ICT uptake. The prices used for the basket were extracted from 2008 data collected by ITU in 150 countries and divided into three sub-baskets: fixed telephony, mobile cellular, and fixed broadband. These figures were then expressed in USD equivalents, purchasing power parity (PPP) and percentage of monthly Gross National Income (GNI) per capita. The results show that developing countries pay relatively more for ICT services. In most developing countries, the price of services falls between 0-25 percent of their GNI per capita whereas in most developed countries the price falls between 0-10% of monthly GNI per capita. This can be explained by the huge difference between the prices of fixed, mobile and the Internet, with fixed being the cheapest and fixed broadband the most expensive while mobile is somewhere in the middle. ICT levels show a strong relationship between IDI values and ICT prices.
22. ITU concludes that overall, results show that the Information Society is advancing, with noticeable growth around the world, but that this positive news should not mislead policy makers. The digital divide still very much exists and requires ICT policies that can accelerate both ICT advancements and significant reductions in costs of fixed broadband in order to improve access.
23. The presentation from Mauritius on *Mauritius the Cyber Island: Using ICT indices for policymaking* provided a brief overview of the key strategic orientation of the country in the development of ICT and described how the country aims to become an ICT Regional Hub. It showed how the development of ICT was used as an engine of growth and job creation, with the objective of developing the country into an attractive investment location. The need to use internationally recognized ICT indicators to measure the effectiveness of ICT policies was underlined. In view of the difficulty in data collection, an ICT Indicators Task Group was set up in Mauritius to define and identify which indicators to use. As a result of the work of the Task Group, policies aimed at improving access and usage were introduced, including free broadband access in secondary schools, the setting up of a national Internet Exchange point, a reduction of international Internet connectivity tariffs, and the massive deployment of community Internet access points. Other policy measures introduced include a universal access fund and a digital e-inclusion project to provide PCs to low income households so as to foster community empowerment. In 2010, a national ID card based on smart card technology will be adopted and a public key infrastructure for online transactions and payments is expected to be deployed. At the same time, several policy measures were taken to improve ICT usage in primary schools, youth clubs and women associations and fora, and to make available a variety of e-government services via mobile telephones or the Internet.
24. In the discussion that followed, it was mentioned that ICT prices should also take into consideration the quality of service as both were considered important. Other issues that were raised include questions on measuring ICT investment and community access. In many countries, the latter was an important way to provide access to large parts of the population. Furthermore, it was stressed that some indicators should be measured in terms of individual (for example by gender) and household (for example by urban-rural) access and use. ITU confirmed that this was important for measuring ICT access and use, and that this was one of the reasons why ITU advocates the collection of ICT data via household surveys because it enables a better quality and disaggregation of data.
25. Some countries also mentioned that ITU should ensure the continuity of the IDI and the timeliness of the data included in the IDI. The need to reduce the delay in publishing data was underlined particularly as indices based on data that had significantly changed by the time of the publication were not providing a timely view of the situation. ITU welcomed the

proposal, indicating that by timing the publication of the IDI with the data collection of ITU, it would help to reduce this time lag to one year.

ICT Household Statistics

26. The morning sessions of the second day were dedicated to a discussion of collecting ICT statistics via household surveys. They focused on the importance of household surveys for improving the quality of ICT indicators and collecting ICT usage data, discussed the definitions of indicators, and presented examples from countries.
27. The ITU presented the *Role of household surveys for collecting ICT statistics* and highlighted the two main sources of ITU data: a) administrative sources for data supplied by telecommunication regulators or government ministries, b) household surveys usually conducted by national statistical offices.
28. The presentation highlighted the limitations of administrative data as far as indicators on usage are concerned. For example, data based on administrative sources underestimate the number of fixed telephone users because fixed telephone lines are characterized by shared access; in addition, the nature of the data makes it impossible to disaggregate them according to, for example, location (geography), gender and income of users. While data collection of mobile cellular subscriptions was fairly easy based on operators' reports, problems arose from the fact that different definitions were used for "subscriber", that inactive SIM cards were counted by some operators and not by others, and that there were an increasing number of cross-border subscribers resulting in the total number of subscriptions exceeding the number of people in the country (more than 100% penetration). Similarly, it is not possible to cross-tabulate the collected data with other classificatory variables such as age, gender, income, education, employment, etc. The same is true for Internet subscriber data, where the disaggregation between residential and business subscribers is not known and for countries where there is no Internet user survey, the number of users is difficult to estimate. This is mainly due to the size of users accessing the Internet in public places such as public Internet access centre (PIACs), at work, in schools, etc. At the same time, the number of mobile broadband users is not known.
29. In contrast, data collected using an ICT household survey offer a number of advantages. First, the data provide information on both the household's and individuals' access and use of ICTs. Data collected from a household survey also provide an indication of actual use of mobile cellular phones, mobile broadband and Internet. At the same time, it is possible to cross-tabulate user data with other variables including age, gender, education, employment, purpose of Internet use, rural-urban, technology used, etc. This will enable more detailed analyses and comparisons which will prove extremely valuable for the formulation of focused and targeted policies.
30. The presentation on *Revised Core ICT Household Indicators* explained the purpose and scope of the revision of the core ICT Household indicators carried out by the Partnership on Measuring ICT for Development in 2008 through a worldwide consultation process. It underlined that the adoption of these core indicators in 2005 was one of the early achievements of the Partnership. The presentation specifically highlighted the revised indicators on access to and use of ICTs, by households and individuals, and explained how they have changed since 2005: either by combining, aggregating, splitting, adding or deleting categories and sub-categories. Definitions were also clarified, expanded or added. The revision of the core list of ICT indicators was required as a result of changing policy interests, data collection experiences and changes in technologies. Among the new indicators was a set on ICT in education. The revised core list of indicators was presented to the UN Statistical Commission in February 2009.
31. During the discussion, participants requested advice on what type of survey to develop when a country has limited resources; for example, is it better to carry-out a stand-alone ICT household survey or to include a module in an existing household survey? ITU suggested that in countries where financial and human resources are limited, it is advisable to piggy-back on (or add a module to) existing surveys, while for countries with sufficient

resources, stand-alone surveys would be a better choice since they will produce data focused on policy requirements with the required depth and scope.

32. On the question concerning the revision of the ICT indicators, ITU stressed that the revisions were generally not replacing existing ones but were aiming at providing a better understanding of the indicators and thus improving data collection.
33. More specific questions related to the indicators were raised during the discussion. Participants were interested, for example, in how the mobile broadband indicator — an indicator that is not available for many countries, is collected by ITU. ITU explained that data were mainly collected through the ITU questionnaire sent to countries and complemented by data coming from Wireless Intelligence. Despite the reliability of this approach, countries were invited and encouraged to verify and update the data collected.
34. It was suggested during the discussion that the number of fixed telephone line users could be estimated by multiplying the number of fixed telephone lines by the number of members in a given household. However, it was pointed out that this would still remain an estimate and that a more accurate number could be obtained by collecting the information using an ICT household survey.
35. Concerning mobile cellular users, a participant stressed that the OECD defines them as users active in the last three months while the proposal in the core indicators was to use a period of 12 months. The ITU consultant indicated that on a global basis, the recommendation was to use a span of 12 months because mobile users indicators did not involve complex recall tasks (such as remembering the value of purchases) and a period of 12 months avoided undesirable seasonal effects and rare events, such as purchasing on-line or searching for health information.

Household statistics: three case studies (Malaysia, Egypt and Greece)

36. The second session continued on the topic of household statistics with a presentation of three country case studies: Malaysia, Egypt and Greece.
37. The presentation *Primary, Secondary and Administrative Data in Telecommunications: Case of Malaysia* highlighted the advantages and disadvantages of using primary (survey) data, secondary (third party) data and administrative data based on the country's experience. In Malaysia, all three types of information are collected annually. The advantages and shortcomings of each method of data collection were reviewed. In general, it was found that primary data obtained through surveys are more useful in measuring usage but can be time-consuming and costly. Administrative data is useful but cannot measure the actual usage of ICTs. Among the disadvantages of secondary data was the dissimilarity in definitions. While surveys also have the disadvantage of being subject to sampling errors, these can be assessed and quantified. Other issues related to bias, coverage errors, non-response errors, and deliberate erroneous information are recognized to be inherent in surveys, but can be reduced if the surveys are well-prepared.
38. The experience of Egypt in collecting the core ICT indicators in order to provide decision-makers with information on access and usage of ICT, was the subject of the second presentation of this session, *ICT Indicators for Households: Egypt's experience*. Data are collected through semi-annual household surveys based on a sample of 21'000 households covering 24 governorates in both urban and rural areas. Rotation technique is used to capture the dynamic changes in ICT usage across the surveyed households. The questionnaire is formulated on the basis of the international core ICT indicators recommended by the Partnership on Measuring ICT for Development. The results are analyzed using both descriptive and analytical techniques. Through this approach, it was possible to measure the digital divide among governorates and regions, as well as based on income level, gender, education level, employment status and age group, and to monitor household expenditure on ICT and ICT usage by the disabled. Security and privacy aspects as well as e-content (languages used to navigate the Internet or Arabic content as a percentage of e-content) are also tracked. The speaker also stressed the importance of mapping ICT indicators from individuals to households and vice-versa and of avoiding seasonal times for data collection that could distort the results.

39. The last speaker for the session presented the *Statistics on ICT use by households and individuals in Greece: The experience from the measurement of the eEurope2005 and i2010 action plans*. This presentation highlighted the experience of Greece in collecting ICT statistics using household surveys by showing results of surveys carried out in the framework of Europe's i2010 initiative. In that context, six national surveys were conducted (households and individuals, enterprises, schools, general practitioners, Internet connect cost and public services). A representative sample of the entire population between 16 and 74 years old was surveyed by telephone research and fully structured questionnaires. The results showed that the typical profile of the ICT user is young, male, well-educated and lives in Athens or other urban areas. Regarding gender, men are using the Internet more than women and for different reasons (online purchases, e-banking and software downloading versus employment seeking). Internet usage is also inversely proportional to the age of users, with the rates of usage increasing as age decreases. Significant increases were noted in the age groups 16-24, 25-34 and 35-44. One area of significant increase is the rate of individuals having purchased goods or services online for private use (estimated at 17% for 2005-2008). Equally notable is the significant decrease of PSTN and ISDN connections to the benefit of DSL connection. The outcomes of the surveys contributed to the development of the Greek Digital Strategy for the period 2006-2013, which aims at creating the conditions for a digital leap in terms of productivity and quality of life, in line with the European policy for the Information Society.
40. In the discussion that followed, questions were raised on the methodology used by Egypt in conducting the survey, in particular the differences between soft and hard indicators, and rotation technique as a method for selecting the sample.
41. Participants also asked Malaysia why new indicators had to be defined. Malaysia mentioned that since ICT is a dynamic field, it is important to review the indicators included in the list to reflect such change. Participants also asked whether all members of a household had to be surveyed or only one representative of the household. Egypt informed participants that they included all members of the family through face-to-face interviews. In Greece or Malaysia, only one person per household was interviewed.
42. Malaysia also emphasized the importance of capacity building for statisticians to develop household surveys, and for analysts to interpret the results. Equally important was the need to train interviewers for face-to-face, phone or written interviews to ensure that the data are collected correctly.

Global and Regional Perspectives, Measuring Impact

Partnership on Measuring ICT for Development

43. The afternoon session examined the global and regional progress on ICT measurement, in particular, with respect to measuring impact.
44. To provide a global perspective, ITU briefly informed those at the afternoon session of the recent progress made in the work of the *Partnership on Measuring ICT for Development*. Launched in 2004, in response to a call for information society measurement at the WSIS Geneva (2003), the Partnership now consists of 10 members, five at the international level (ITU, OECD, UNCTAD, UNESCO Institute for Statistics, and the World Bank) and five at the regional level (Economic Commission for Africa, Economic Commission for Latin America and the Caribbean, Economic Commission for Asia-Pacific, Economic Commission for Western Asia, and Eurostat). ITU recalled the core list of ICT indicators whose scope was significantly expanded with the adjunction of new core indicators on ICT in education. The list now includes 9 indicators on infrastructure, 13 on households and individuals, 12 on businesses, 4 on the ICT sector and ICT trade, and 9 on ICT in education. The revised core list of ICT indicators was presented to the 40th session of the UN Statistical Commission in February 2009. Other recent achievements of the Partnership include the release of a publication¹ that brings together available core indicator data and the creation of a new

¹ Partnership on Measuring ICT for Development (2008): The Global Information Society: A Statistical View 2008. United Nations: Santiago.

Task Group on measuring ICT impacts, which complements existing ones on e-government, database development and capacity building. In the area of capacity-building, members of the Partnership produced two manuals – one for measuring ICT in business (produced by UNCTAD) and one for measuring ICT access and use by households and individuals (produced by ITU) (see below session). Future work of the Partnership will focus on capacity building, statistical methodology and the preparation of inputs to the UN Statistical Commission meeting of 2010, data dissemination, the addition of e-government indicators to the core list, work on measuring ICT impact, and the organization of a global event in 2010.

Measuring the economic impact of ICT: a view from the OECD

45. The speaker presented the different approaches *Towards measuring the economic impact of ICT* including measuring the contribution of ICT investment to GDP growth, the impact of ICT on multi-factor productivity (MFP), linking market regulation and ICT investment, measuring the effect of final demand for ICT on growth and investigating multiplier effects and network effects. Results of studies have shown that investment in ICT is important to GDP growth, and that intangibles (such as software, R&D, brand equity, firm-specific human capital and organisational know-how) explain a large portion of multi-factor productivity which in turn, represents a large portion of GDP growth. Studies also found that the slow diffusion of ICT (in terms of ICT investment) appears to be explicable in some countries by the extent of product market regulation. The speaker also informed the audience about the work of the Partnership Task Group on Measuring ICT Impacts led by OECD and which is currently preparing a user guide for countries interested in measuring the social and economic impact of ICTs.

Regional perspectives

46. The United Nations Economic Commission for Latin America and the Caribbean (ECLAC) presented ECLAC's Information Society programme, *Progress in the measurement of ICT statistics, indicators for digital inclusion, and challenges in the area of measurement*. Within the framework of the Information Society programme, the OSILAC project (Observatory for the Information Society in Latin America and the Caribbean) works with the Partnership on measuring ICT for development to define and gather a common set of ICT indicators and to help countries of the region in their efforts to produce statistics on the information society. A second project, eLAC (Regional Action Plan for the Information Society) provides support to countries of the region in the elaboration, implementation and follow-up of national, regional and subregional information society strategies. The speaker further illustrated the impressive progress made in measuring the information society in the Latin America and Caribbean countries and presented data on household Internet access by income for a number of countries. She illustrated the regional digital divide with information on household telephone access based on urban and rural areas. Important work that remained to be done includes the harmonization of output and the development of new indicators such as ICT impacts, e-government and e-health.
47. The presenter from LIRNEasia described the work on *Measuring progress towards information societies in emerging Asia*. The work involved surveys of individuals classified as 'Bottom of the Pyramid' (BOP) in six countries with the objective of better grasping how BOP interacts with ICTs so as to provide policy-makers with better data analysis. Large surveys were conducted in 2005, 2006 and 2008 with almost 20'000 face-to-face interviews in six countries. The results showed that BOP individuals have quite high telephone use, including rural areas, but only moderate ownership levels. In addition to a decrease in the use of public phones, the survey confirmed that the mobile phone was the most common ICT in use by BOP individuals in most of the surveyed countries, and that the divide between urban and rural BOP as far as ownership is concerned is declining. The survey results showed that not owning a phone is a result of choice rather than availability, with only 2% reporting that they do not own a phone because there is no service in their area. The picture is quite different for the Internet, where most BOP individuals had never heard of the Internet or never accessed it. The results also showed that the use of the mobile telephone was still very basic, mostly for voice and text messaging, except for South-East Asia where mobile phone use was more advanced. On the benefits of access to ICT, most BOP individuals responded that the greatest perceived benefit was in the area of

emergency communications and in maintaining relationships. Among the economic benefits, the ability to save money by cutting down travel costs ranked first.

48. The last presentation of the session was from Eurostat, on the topic of *Benchmarking the information society in Europe* which is being carried out within the EU i2010 strategy and benchmarking framework (to be renewed in 2009). In that context, ICT indicators focus on access and use of ICTs by citizens and enterprises, e-government and ICT impact. Other measurement topics that have been addressed are related to security and trust, use of advanced ICT services by individuals, and ICT innovation. For ICT household and business surveys, specific modules are being added every year, focusing on different themes or modules. For the household survey the modules included e-government, skills and digital literacy, advanced services, e-commerce and trust and security. The enterprise survey modules included e-government, skills and digital literacy, e-business, e-commerce and security. The speaker also informed about the ICT impacts project, which involves linking data on ICT usage, innovation and R&D, with information from business surveys in order to provide a basis for the analysis of the relationship between ICT usage and business performance, and for being able to identify the productivity effect of ICT usage. In order to move from access to impact, the need for statistics on the ICT sector and on ICT investment was stressed. This is where future developments will focus. In 2010, Eurostat expects to release, for the first time, harmonized data on ICT investment.
49. The discussion of this session mainly consisted of requests to clarify and expand on various aspects of the presentations and, in particular, the classification of the ICT sector and measurement of ICT-enabled services, including how to measure ICT use by foreigners (in particular, migrants) and the measurement of outsourcing. The latter is an area of importance, in particular, for developing countries focussing on developing their capacities in the area of ICT-enabled services. So far, no internationally agreed, measurable definition of international outsourcing exists and, therefore, no comparable data are available.

Capacity Building on ICT Statistics

50. Capacity building on ICT statistics in developing countries was the focus of the final session of the day. It presented work carried out by members of the Partnership on Measuring ICT for Development as well as COMESA.

Training on business statistics

51. The United Nations Conference on Trade and Development (UNCTAD) presented its work on ICT statistics, in particular, the *Manual on the Production of Statistics on the Information Economy and its related training course*. The Manual's objective is to serve as a reference document for statisticians responsible for collecting ICT data. It includes technical information related to survey design, methodology, data dissemination and reporting. The Manual is a practical tool that takes users through every step necessary to conduct an ICT business survey and to analyse the survey results. It also provides technical information on key issues and includes model questionnaires and definitions. The Manual was released in 2007 and a revised version was produced after thorough country consultations held in 2008. Based on the Manual and on UNCTAD pedagogical materials, a training course was developed and delivered in Bogotá (Colombia), Incheon (Republic of Korea) and Trinidad and Tobago to participants from countries in the respective regions. After each training module, individual tests were conducted in order to verify the degree to which participants grasped the material, as well as to get their feedback.

Training on household statistics

52. ITU presented its *Manual on Measuring ICT Access and Use by Households and Individuals* and its training course, which complements the UNCTAD Manual. An increasing number of countries are conducting specialized ICT household surveys or are including ICT questions in general surveys. The Manual aims to increase the availability and quality of data on access to, and use of, ICT by households and individuals. Intended as an authoritative reference tool for ICT data producers worldwide, the Manual aims to assist national

statistical offices in collecting, processing, evaluating and disseminating ICT household statistics. One of the key challenges at the global level is the lack of ICT household statistics and the relatively poor state of ICT household measurement. Other challenges include the lack of comparability between statistics collected by countries, lack of information about surveys (metadata), and, in some areas, lack of adherence to the core ICT indicator standards. The Manual provides detailed information on survey design, survey planning, survey implementation, data analysis, and data dissemination. It also provides information on other source material from the UN Statistics Division for conducting general household survey. The speaker also highlighted some of the practical guidelines available in the Manual on sampling design and selecting respondents. She presented the ITU model questionnaire that can be used in conducting a stand-alone survey. The Manual, to be available in Arabic, Chinese, English, French, Russian and Spanish, will be sent to countries for consultation before it is presented to the 2010 session of the UN Statistical Commission. The ITU also mentioned that a training course was developed based on the Manual, and was delivered for the first time in Trinidad and Tobago for the Caribbean countries. After each training module, individual tests were conducted in order to verify the degree to which participants grasped the material as well as to get their feedback.

Regional experiences in ICT statistical work: challenges in Africa and the Arab region

53. Following on the previous two speakers, the Common Market for Eastern and Southern Africa (COMESA) presented *COMESA's Programme on E-readiness Assessment & Measuring Information Society*. An initial assessment of e-readiness in COMESA countries showed the dissimilarity between data collected (different tools and methodologies) which prevented appropriate cross-country comparisons. The key challenges to ICT measurement in COMESA member countries include the lack of adequate skills in collecting ICT statistics and limited coordination between stakeholders at national and regional levels. The efforts have therefore focused on strengthening national capacities to collect, organize, share and manage ICT data, data analysis and dissemination of results. The speaker outlined the roadmap set by COMESA to monitor e-readiness: setting up of a one-stop shop for e-readiness assessment and information society measurement in each COMESA country; publication of national ICT sector reports; involvement of academic and research institutions in information society measurement; setting up of regional databases; organization of national and regional capacity building workshops and publication of a regional ICT benchmarking report. As part of an ambitious programme, COMESA plans to support the development of ICT household surveys, conduct validation workshops for ICT stakeholders, and train national statistical offices on ICT household surveys, including data analysis. The delivery of a training course on the collection of ICT statistics (business and household) is scheduled to take place in mid-2009, in collaboration with ITU, UNCTAD and ECA, followed by implementation of the survey. The results are expected to be made available to a Ministerial meeting for the COMESA countries later in the year.
54. Finally, the UN Economic and Social Commission for Western Asia (ESCWA) provided an overview of the *ESCWA's ICT measurement work* including challenges and opportunities in the area of ICT measurement in the region. Among the challenges faced by countries of the region is the fact that ICT data collection is often partial and, in most cases, not institutionalized, statistics on the ICT sector are practically nonexistent, and the importance of ICT indicators at the decision-making level is not adequately recognized, with the exception of Egypt and Jordan. In 2008, ESCWA carried out training workshops in Iraq and Jordan in ICT core statistics and is planning similar workshops for statistical offices for Iraq, Syria and GCC countries. The speaker also presented work on measuring the status of Arab women in science and technology (S&T), including the creation of a database that will build upon the existing Global Information Society database created by the Arab Women Organization. Already, 15 countries have set up focal points to work on this project and collect data, and 55 indicators have been identified, grouped into four categories (general, education, workplace and impact of Arab women working in science and technology). Other countries that have received technical assistance on ICT statistics include Qatar and Yemen.
55. In the subsequent discussion, several countries expressed their interest in participating in future trainings on ICT statistics. In particular, several African countries requested to be

invited to participate in the planned joint ITU-UNCTAD training course to be held in Africa later in 2009, in cooperation with UNECA and COMESA.

56. Other topics raised with respect to capacity building needs included sampling techniques and the need to provide ready-made model questionnaires on ICT. The importance of collaboration among different stakeholders involved in ICT statistics at the national level was also raised. At the suggestion of a participant to foster collaboration among the various national agencies involved in statistical work (national ICT policy makers and national statistical offices), ITU indicated that the experience of Egypt presented in the morning session was an example of a positive and effective way forward. A participant also suggested devoting more work to gender-related statistics.

ICT and Employment

57. On the final day of the WTIM, the joint session with the ITU-D Study Group I on Question 21 (SGQ 21/1) provided an opportunity to review how ICTs have changed employment in the telecommunication sector, from both the employers and employees perspective and how the impact of ICT on employment could be monitored and measured.
58. The presentation from ILO entitled *Employment statistics in telecoms: What could be gleaned if ...* provided information on the impact of ICT on employment. Taking the US as a basis for analysis, the speaker showed that employment in the telecommunications sector as a percentage of total employment has slightly decreased, in particular employment in routine occupations. This was mainly due to the automation of some processes. On the other hand, employment in machine production and maintenance has increased. With this example, he emphasized the importance of examining occupational changes that occurred to better understand the impact of ICTs in the telecommunication sector. He informed participants of the importance of statistics in understanding these changes and in providing training and job placements. The presentation also mentioned ILO's new classification of occupations (ISCO) and the importance of using it in collecting data on employment. In addition, when carrying out enterprise surveys, countries should use the most disaggregated classification which will allow the identification of more specific ICT industries.
59. The presentation of France Telecom-Orange entitled *ICT: tools for job creation, destruction or transformation in the telecom sector* focused on the impact of new technologies on employment in the telecom sector. With the rapid pace of technological change, employment in telecommunication has become unstable and has called upon employees to constantly adapt to this changing environment. In particular, changes were due to the type of services offered, mostly driven by consumer preference. For example, employment in fixed telephone line services has decreased while employment in the wireless services has increased. It was also mentioned that it is important for employees to use ICTs as a means to develop their careers, and at the same time for employers to use ICTs to advertise job opportunities, as well as required competencies. For example, the percentage of employees working in customer services in the France Telecom-Orange Group's activities worldwide has risen by 20% over the past three years. This is an area where recruitment is the highest. As new technologies reach the market and create additional services available to customers, employment opportunities increase. However, to capitalize on these opportunities, a high degree of internal mobility, strategies to create employment and capacity-building are essential.
60. The presentation from Uni Telecom Global Union, *Impact of ICT on Employment and the Convergence*, showed that a large number of multinational telecom companies have reported job losses and cuts. The first to feel the downturn are workers in call centres who are often non-unionized and unable to negotiate on an equal basis. On the other hand, investment in ICT has led to an increase in the number of jobs in the sector and this upward trend is expected to continue. But the technological evolution of the sector is calling for new skills and competencies which are forcing an overhaul of the labour force. Political leaders are now engaging in the creation of technology programmes to increase capacities. Next generation networks (NGN) and broadband technologies are expected to have a positive effect on the economy and therefore on the creation of jobs. This is likely to be felt first in the US where NGN and broadband investments have expanded considerably

and in the European Union which is deploying its broadband infrastructure to boost the economy. The speaker, however, warned participants that this technology push was likely to worsen the digital divide if similar efforts were not made worldwide. The speaker called upon ITU to actively support the countries which are increasing ICT investments and infrastructure development.

61. The discussions highlighted the need to measure the impact of ICT on *indirect* employment. However, such measurement requires a considerable data compilation effort since the effect of the ICT sector (which includes ICT manufacturing and services, parts of the business sector, as well as the telecom sector) necessitates an analysis of the national accounts to analyse productivity gains brought about by ICT to other sectors of the economy.
62. The presentation *Impact of telecommunication development on employment*, presented by the rapporteur of the ITU-D Study Group on question 21 highlighted that liberalization and privatization in the telecom industry have generated huge investments everywhere in the world with some 200 billions USD per year in telecom services since 2000. These investments led to a spectacular growth in mobile telephony and the Internet. At the same time, many jobs were lost in the telecommunications sector, in particular in the area of installation and maintenance of central office switching equipment. New technologies and global competition also generate flexible and adaptable working relationships and reorganization of work. Telework is an example of new forms of work with activities like outsourcing or offshoring (e.g. call centres). While the ICT sector is known to be an engine of growth, it also generates employment in other sectors which depend either directly or indirectly on the ICT industry. This multiplier effect can be quite significant; in the United States for example, it reaches 1.5.
63. The presenter also informed the participants of the work of Question 21/1 of the ITU-D Study Group 1, which focuses on measuring the impact of ICT in employment. He mentioned that in 2007, a questionnaire was sent by ITU to all countries to solicit data on employment generated by the telecom sector and to call for case studies to illustrate countries' experience and policies that stimulate job creation. Based on the 16 contributions received, as well as other studies, a report has been prepared that highlights best practices and incentive policies that have generated employment. The final report, which also provides guidelines and recommendations, will be submitted to the 2010 World Telecommunication Development Conference as the outcome of the study of Question 21/1. The speaker invited participants to take part in the final meeting of the SGQ 21/1 scheduled for the afternoon to finalize this report.
64. The presentation of Senegal indicated that the growth of the ICT sector produces productivity gains in nearly all sectors of the economy. But so far, the relationship between ICTs and employment has solely focused on quantitative aspects, namely, those jobs that are going to be created, and how many. It has largely ignored important qualitative aspects, in particular the adaptations that individuals and companies need to undergo in order for new activities and new occupations to emerge. For example, Senegal has high-quality and relatively abundant human resources as well as considerable scientific and technological potential, all of which can be harnessed in the interests of sustainable development. The main area where the correlation between ICT and employment has been proven is that of telecentres. Telecentres enabled the creation of over 10'000 jobs between 1992 and 1998, and are widely available in rural areas. Their contribution to Senegal's GDP rose from 0.24% in 1994 to 0.37% in 1995, while their turnover nearly doubled. However, with the decrease in costs and the widespread development of mobile telephony, several telecentres are now closing down with 130 of them stopping operation every 30 days. This resulted in an annual loss of almost 3'000 jobs. In addition to providing basic telephony and IT services, telecentres are now offering offshore electronic publishing, digital archiving, and software development as well as call centre operations and other teleservices. The fixed and mobile telephony sectors are also the source of job creation in the area of network deployment, operation and maintenance, in the related retail services (for example, for selling or topping prepaid cards, recycling equipment), and value-added services. Overall, the ICT sector is providing opportunities for employment in both a direct and an indirect manner, and plays a key role in the wealth distribution process.
65. In Cameroon, the creation of jobs has essentially been seen as a result of the growth in Internet use and mobile phone access. However, such increases in employment have been

rather limited in Africa compared with the number of jobs created in Latin America and Asia as a result of ICT expansion. Considering Cameroon's problems relating to the dissemination, accessibility and use of ICTs, particularly because of low income levels and high costs of services and equipment, proposals have been put forward with a view to enhancing the contribution to job creation as part of the fight against unemployment. These include policies aimed at innovation and at a better dissemination of ICTs, policies to assist the ICT sector in securing productivity gains through technological progress, and policies to bring about favourable conditions to foster the use of ICT as part of the country's national strategy for combating unemployment.

66. The discussion that followed saw a number of participants raise the importance of identifying appropriate indicators for tracking areas such as software development, revenues, e-commerce, e-banking.
67. One area where Africa was seen as a potential player was that of call centres to provide services cost-effectively to companies operating in Europe or the US. While some participants underlined the limitations for job creations in call centres, there was a clear recognition that this was an area where new job opportunities existed, provided that adequate sub-contracting conditions were set. It was, therefore, considered important to monitor offshoring and outsourcing.

Conclusions and Recommendations

68. Based on the discussions held during the meeting, the following main conclusions and recommendations were presented in the final session.

Rec. 1 Creation of an Expert Group on telecommunication/ICT indicators

69. The meeting endorsed the proposal to create an Expert Group with clearly defined terms of reference for the purpose of reviewing, revising and finalizing the ITU telecommunication/ICT indicators presented during the meeting, and their definition. It also recommends that the Expert Group fast-track its work to be completed before the first quarter of 2010 and calls upon members to join this Group. The Expert Group is expected to meet in person or through online discussions. It will be open to all ITU members as well as to invited experts, engineers, statisticians and analysts who know the technologies and the services in addition to the indicators needed to measure them.

Rec. 2 Reduction of the time-lag in data release and timely submission of data

70. Several delegates underscored the need for reliable and accurate data as a sound basis for policy-making. The need for recent data was found equally important, particularly where ICT development was fast evolving. In the absence of up-to-date data, it is difficult for policy makers to assess ICT development and the impact of their policy measures.
71. The meeting suggested reducing the time-lag to one year in releasing the data collected from countries. In order to do this, the countries are requested to submit their data to ITU within deadlines, based on the internationally-agreed indicators and definitions to help reflect the current ICT development regionally and internationally that will provide a sound basis for policy-making. In this context, ITU should synchronize the data collection with the release of the WTI database.

Rec. 3 Collection of ICT statistics by way of household surveys

72. A number of presentations underscored the fact that certain data, such as those related to Internet and mobile phone users, are insufficiently available through conventional administrative sources and called for data collection of these indicators via national ICT household surveys. These indicators, however, are becoming more and more critical to provide an accurate and detailed picture of ICT use in countries thus contributing to improving ICT policy and monitoring its impact. The Partnership on Measuring ICT for Development, to which ITU is a member and active contributor, has developed a core list of

ICT indicators collected through household ICT surveys, which has been adopted by the UN Statistical Commission 2007, encouraging all countries to collect such indicators.

73. In this context, the meeting welcomed the publication by ITU of the *Manual for Measuring ICT Access and Use by Households and Individuals* which was premiered on the occasion of WTIM-09. Based on the internationally-agreed set of core ICT indicators developed by the Partnership on Measuring ICT for Development, the Manual is a practical tool that provides useful guidance and can serve as reference material when preparing, designing and implementing ICT household surveys.
74. The meeting recommended the collection of ICT statistics through household surveys based on the internationally agreed core list of ICT indicators. Data on access and use of ICT by households and individuals also facilitates a more in-depth analysis of national ICT developments by allowing the disaggregation of data by gender and by urban/rural areas.

Rec. 4 Capacity-building in ICT statistics

75. A common thread throughout the sessions has been the need to develop capacities and skills in data collection, analysis and reporting. This is important not only for ensuring the quality of data but also for data comparability for benchmarking. The need for capacity-building has been stressed in the area of household ICT statistics, given that this is a rather new area for statistical offices.
76. The meeting recommended stepping up capacity building for national statistical offices in developing countries on the production of ICT statistics. In this context, ITU, in close cooperation with other international and regional organizations, is called upon to help countries build capacity in ICT household statistics through training courses. ITU should also continue to provide technical assistance to regulators and Ministries in the area of telecommunication/ICT statistics.

Rec. 5 Improvement of indicators and data on measuring impact

77. The role of ICT in driving growth has been recognized at the highest political level as a result of the World Summit on the Information Society (WSIS) organized by ITU in 2003 and 2005. To maintain the momentum, and to provide the rationale for greater investment in ICT, more work is needed to measure the economic and social impact of ICT. The meeting recommended that further work be carried out at the national and international level to measure the impact of ICT on socio-economic development, including the measurement of outsourcing and offshoring services.

Rec. 6 Collaborative work

78. Cooperation in the field of statistics has seen a huge improvement over the past few years, particularly with the creation of the global Partnership on Measuring ICT for Development launched in 2004 in response to a call by WSIS-03 for information society measurement. Since its creation, the Partnership has achieved remarkable progress in defining international standards on ICT statistics, raising awareness on the importance of ICT statistics for ICT policy making, assisting countries build capacities in their ICT data collection programmes and coordinating activities of different agencies involved in the ICT measurement work. The Partnership has also examined new important territory such as ICT in education, e-government, impacts and gender.
79. The meeting expressed its appreciation for the work of ITU and other members of the Partnership in ensuring the coordination of ICT statistics regionally and internationally. Collaborative work should now focus at the national level with the aim of building synergies between policy needs and technical expertise. The meeting appreciated the collaborative work carried out by the Partnership on Measuring ICT for Development to improve the availability of ICT statistics globally. At the national level, the meeting recommended increasing the cooperation between ICT policy makers, including the Regulatory Authorities and Ministries, and the National Statistical Offices, in identifying indicators and collecting ICT statistics.

Rec. 7 Measuring the impact of ICT on employment in the telecommunication sector

80. ICT development has triggered important changes in employment in recent years. The joint session with the ITU-D Study Group I (on Question 21 /RGQ 21/1) gave important insights on how ICTs have changed employment in the telecommunication sector from both the employers and employees perspective and made suggestions on how the impact of ICT on employment could be monitored and measured.
81. In view of the important changes that ICTs have triggered concerning employment, the meeting recommended that countries should increase their efforts to measure employment in the telecommunication sector. When measuring employment, the meeting recommended that countries use the new ILO ISCO classification which takes into consideration new ICT occupations. In addition, when carrying out enterprise surveys, countries should use the most disaggregated classification, which will allow the identification of more specific ICT industries.

Closing

82. The meeting was closed by the Chief of the ITU BDT Policies and Strategies Department who thanked the Egyptian Ministry of Communication and Information Technology for the generous and excellent organization of the WTI meeting, as well as the experts and participants who actively contributed to the discussions. He also welcomed the constructive proposals and suggestions made during the meeting. Concerning the timely release of ITU data, he mentioned that ITU will make every effort, given the limited resources it currently has, to ensure that data are published on time; at the same time, ITU counts on the collaboration of countries to submit the data within the given deadlines. He further suggested that possibilities to increase resources will be explored, including secondment of national experts to work in the ITU in the area of ICT statistics.
83. The next (8th) WTIM is scheduled to take place during the last quarter of 2010. Member States interested in hosting the 8th WTIM should contact the ITU/BDT.