



12TH WORLD TELECOMMUNICATION/ICT INDICATORS SYMPOSIUM (WTIS)
24-26 November 2014
Tbilisi, Georgia

Final Report

1. The 12th World Telecommunication/ICT Indicators Symposium (WTIS), organized by the International Telecommunication Union (ITU), took place in Tbilisi, Georgia, from 24 to 26 November 2014. It was hosted by the Georgian National Communication Commission (GNCC), in cooperation with the Ministry of Economy and Sustainable Development of Georgia.
2. The Symposium attracted 250 participants from 79 Member States, 15 public and private organizations (including academia) and other regional and international organizations.
3. The work of WTIS was conducted under the chairmanship of H.E. Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development, Ministry of Economy and Sustainable Development of Georgia, and Mr Irakli Kashibadze, Chairman of the Georgia's Innovation and Technology Agency.
4. The WTIS 2014 featured a Ministerial Roundtable on the post 2015 development agenda and future priorities for ICT for development (ICT4D) policy. Other topics included big data for development and the future of ICT measurement; measuring competition, regulation and affordability of ICT services; current and future work on telecommunication/ICT indicators and ICT household indicators, including reports by the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH); and data quality, big data and open data. A special session on international coordination of ICT measurement was held at the occasion of the 10th Anniversary of the Partnership on Measuring ICT for Development.
5. For the first time, the ITU *Measuring the Information Society Report* was launched at WTIS during a special launch ceremony. The meeting also featured a session dedicated to the discussion of the results of the report took place, and a panel debate on the ICT Development Index (IDI).
6. This report summarizes the interventions, presentations and discussions of each session and presents the final conclusions and recommendations of the meeting. Further information, such as the agenda, the presentation slides, web cast archives, media information, contributing documents and the list of participants, is available at <http://www.itu.int/ITU-D/ict/wtis14/index.html>.

Opening Session

7. The 12th WTIS was opened by the Prime Minister of Georgia and other high-level representatives from the Government of Georgia and the ITU. A short video highlighting the human stories behind the numbers was shown at the beginning.
8. In his opening remarks, **H.E. Mr Irakli Garibashvili, Prime Minister of Georgia**, highlighted the importance of telecommunication as a priority sector for the country's development. Several projects were under implementation, jointly with other international partners, to foster ICT development and bring broadband Internet access to all citizens in the country. He mentioned concrete measures that the Government had taken in this regard, such as the liberalization of the telecommunication sector and breaking up of monopolies, the move towards digital broadcasting, and the introduction of e-government services and simplification of administrative procedures. He highlighted the importance of achieving and monitoring tangible results, referring to the improvement of Georgia's ranking in the recent ITU reports. Mr Garibashvili also thanked all delegates who came to Georgia for this meeting and expressed his warm welcome.
9. The welcome address for the 12th WTIS was given by **Mr Houlin Zhao, Secretary-General Elect of the ITU**, who thanked the Government of Georgia for hosting WTIS and for the tremendous hospitality provided. He highlighted the high level of attendance, including many Ministers and Director Generals, which showed the relevance of WTIS at the dawn of the post 2015-development period where ICTs were expected to play a critical role for the sustainable development of countries. Referring to recent ICT trends, he posed the questions of whether we really knew the population that was still unconnected, and who those unconnected people were? It was very important to identify those groups in order to target policies and make right investment choices. Mr Zhao highlighted ITU's work in collecting statistics and over 100 indicators for 200 economies globally and ensured ITU's commitment to high standards when helping countries to monitor progress towards attaining universal access. He congratulated the BDT for re-engineering the WTIS and making it into a big Symposium. In closing, he assured participants his continued support for the work on measuring the information society, in particular given the importance of ICTs in achieving sustainable development goals.
10. In his opening remarks, **H.E. Mr George Kvirikashvili, Vice-Prime Minister and Minister of Economy and Sustainable Development of Georgia**, informed participants about important measures that had been taken and reforms carried out in order to develop ICT in the country. Complementing the Prime Minister's remarks, Mr Kvirikashvili shared with the audience a range of policies that had been implemented in the country in the area of ICT, including the development of e-net; the introduction of ICTs in schools to raise the skill levels among students; and the involvement of citizens in e-government offering more than 300 public services to customers. Under the auspices of the Ministry, technology parks were created and a digital agency set up with the objective to switch to digital broadcasting. The personal participation and support by the Prime Minister in the development of ICT in Georgia and his vision of ICT as the main challenge and driver in the 21st century has helped improve the ICT rankings of Georgia in international benchmarks and increased its competitiveness and economic strength.

11. **Mr Brahim Sanou, Director of the ITU Telecommunication Development Bureau**, welcomed the participants to WTIS 2014 and thanked the Government of Georgia for hosting the event and for the kind hospitality extended to all participants. He informed participants about the new features of WTIS, which would launch for the first time the *ITU Measuring the Information Society Report*. Other topics of importance were quality of data and therefore he had commissioned a study to assess ITU's current data collection and processing. Furthermore, one of the key topics this year was big data given the ongoing debate in international forums on the data revolution which was very much driven by and dependent on ICTs. Mr Sanou mentioned the recently concluded ITU Plenipotentiary Conference and its Resolution 131, as well as the sixth World Telecommunication Development Conference held in 2014 and its Resolution 8, both of which reinforced ITU's mandate to carry out work on ICT statistics. He thanked the two statistical expert groups - the Expert Group on Telecommunication and ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH) – for their excellent work to improve methodologies and define indicators. Finally, he thanked the Prime Minister for gracing this Symposium with his presence, which was setting the bar high for the next host of WTIS.
12. **Mr Vakhtang Abashidze, Chairperson, Georgian National Communication Commission**, delivered his opening remarks. He stressed the important role of ICT for economic development and the integration into the global information society. Therefore, Georgia takes into consideration international telecommunication trends and best practice in directing the sector. He stressed that Georgia was going through a crucial stage, with the digital switchover to be completed by June 2015, and the formulation of a strategy for the development of wireless broadband. The latter included the liberalization of GSM and UMTS frequencies and the allocation of 800 band for wireless technologies, which would bring 4G services to Georgia within a few months. Mr Abashidze concluded by highlighting that one of the key priorities for the future was to eliminate the urban-rural divide in the country.
13. At the end of the Opening Ceremony, **H.E. Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development, Georgia**, was briefly introduced as Chair of WTIS 2015.

Ministerial Roundtable on the post 2015 development agenda and future priorities for ICT for development (ICT4D)

14. Following the opening ceremony, the Ministerial Roundtable on the post 2015 development agenda and future priorities for ICT for development (ICT4D) policy was opened by the WTIS Chair, **Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development of Georgia**, who introduced the moderator, **Dr Cosmas Zavazava, Chief of the Project Support and Knowledge Management Department within the ITU Telecommunication Development Bureau**. Following the introduction of the keynote speaker and the panelists, Dr Zavazava handed the floor to **Professor Richard Heeks, Director at the Centre for Development Informatics at the University of Manchester in the United Kingdom**, to deliver his keynote address.
15. Professor Heeks began his address by pointing to the main differences that distinguish the post 2015 development agenda (DA) from the current Millennium Development Goals (MDGs). The new agenda,

which Professor Heeks called the single most important force shaping the future for development (and for ICT4D priorities), focuses on the environment and on sustainability, and calls for inclusive development.

16. The keynote speaker emphasized a mismatch between these new development priorities and the current ICT4D debate, which according to him continued to centre mainly on issues of infrastructure development and the delivery of services. He called upon the ICT4D community to re-think its priorities so as to adapt them to the new development era and, in order to remain relevant, embrace the following three concepts: transformation, sustainability and inclusion. Digital transformation would ensure the adoption of new tools and applications, including big and open data, for better policy making. Digital sustainability would not only use ICTs as a tool but rather fundamentally change the way in which sustainable development is delivered. Finally, digital inclusion would go beyond overcoming the digital divide but actually use ICTs to support innovation systems, build new business models, and digitally empower citizens, including through the promotion of digital skills. According to Professor Heeks, these steps would eventually allow development to transform into digital development, in which ICTs are not simply a tool amongst others, but rather a platform for 'development through ICTs', where economic, social and political life is digitally mediated. Professor Heeks further pointed out that the post 2015 monitoring framework would have to adapt to these new ICT4D priorities to evaluate and monitor progress.
17. After thanking the keynote speaker, the moderator emphasized the importance of environmental protection and sustainable development in the post 2015 DA. He briefly recalled the key questions that the Ministerial Roundtable should address and gave the floor to the panelists, to share their vision and ideas on the future DA, ICT4D priorities, and the role of monitoring.
18. **His Excellency, Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development of Georgia** was the first panelist to take the floor. He explained that to boost the country's knowledge economy and to fully benefit from ICTs, it was necessary to provide high-speed Internet access to all its citizens. Regulation and increased competition remained important tools to bring down prices and increase uptake, particularly in rural areas. At the same time, Mr Kumsishvili explained that the Government of Georgia was driving demand for ICT use by providing public access to the Internet in libraries and post offices, and by increasing literacy rates within the country. He also highlighted the importance of the WTIS, and the need for the right statistics to track progress, attract investors, and guide policy makers.
19. In his statement, **H.E. Dr Azzam Sleit, Minister of Information and Communication Technology of Jordan** highlighted the ICT sector as one of the most important sectors of the economy. He explained that Jordan's National ICT Strategy recognized ICTs as the country's engine of economic growth and job creation and Jordan had increased its efforts to promote ICT skills for everyone in the country to benefit from ICTs. The government was driving a number of ICT projects, including the development of a single electronic health record system and a cloud computing system, and developing innovative applications in the areas of e-learning, and e-health. These efforts were accompanied by the development of a national broadband network, key public infrastructure (KPI), and new e-commerce legislation. Dr Sleit

made it clear that Jordan recognized the need for reliable data to measure ICT uptake and use, and that it was also looking into the potential of big data.

20. **Namibia's Hon. Stanley Simataa, Deputy Minister of Information and Communication Technology**, pointed to the fact that ICTs had become an integral part of peoples' lives and that most citizens lived in a digitally enabled environment. While ICTs have simplified people's lives, more needs to be done to adapt service delivery to new ICTs to all citizens. Mr Simataa warned against the risk of separating the post 2015 DA from the ICT4D agenda and highlighted the need to use ICTs to help achieve unfinished business in all areas of social and economic development. The Minister further pointed to the need to better understand and measure the impact of growing ICT use and uptake, including on research and innovation, to provide empirical evidence on the progress made, and to highlight barriers for better policies. He emphasized that appropriate monitoring, especially of the post 2015 DA, was important at every point in time, and not only to assess final results, to ensure that corrective action could be taken on time.
21. In her intervention, **Dr Nagwa Ebrahim Elshenawy, Undersecretary for Information and Strategic Planning of Egypt's Ministry of Communications and Information Technology** focused on the relevance of measurement, including at the international level, and the importance of the statistical community in the post 2015 development framework. Dr Elshenawy explained that comparable and harmonized ICT data, such as those produced by ITU, helped countries to identify progress, uncover weaknesses, and monitor existing, and set new targets. She highlighted the importance of national monitoring and pointed to Egypt's new ICT strategy, which included a number of targets that would be monitored over time, including a target to increase access to broadband Internet, which in Egypt was available to less than 50 per cent of the population. The plan stipulated the use of ICTs to achieve broader social equality, more innovation, and a greater contribution of the ICT sector to the overall economy, with specific targets attached to these goals. Dr Elshenawy also addressed the importance of monitoring the impact of ICTs, and area where Egypt has also started to carry out research.
22. **Mr Pali Lehohla, Statistician General of South Africa** introduced the recently launched report *A World That Counts: Mobilising the Data Revolution for Sustainable Development*. The report was produced by the UN Secretary General's Independent Expert Advisory Group on Data Revolution, of which Mr Lehohla is a member. Mr Lehohla discussed some of the main findings of the report, including the possibilities of using statistics to increase transparency and to transform the way data are collected, disseminated and used. He talked about the report's emphasis on standards and principals to ensure that new data sources produced reliable data, and discussed the need for capacity building and resources to ensure that all countries could participate in, and benefit from, the data revolution. Mr Lehohla pointed out that while the MDGs drew the attention to the need for reliable and comparable statistics, more recent developments, including the emergence of new (and big) data sources, had further raised the importance of measurement for policy making. He explained that when in 2009 the UN Secretary General created the UN Global Pulse, an initiative that would try to use big data for sustainable development and humanitarian action, many statisticians saw this initiative as disruptive. Since then, however, the statistical community had recognized the importance of looking into new data sources and the need to work with the private sector, through public-private partnerships. In this

context, Mr Lehohla pointed to the role of the UN as an honest broker to which nations have rendered bits of their sovereignty. Mr Lehohla expressed the importance he attached to statistics - a good that defies the economic law of scarcity since it may be shared and used by many - for economic and social decision making.

23. The final intervention by **Dr Aida Opoku-Mensah, Special Advisor on the Post 2015 Development Agenda, from the UN Economic Commission for Africa**, pointed to the importance of ICTs for achieving the Sustainable Development Goals (SDGs). To be able to use ICTs as a development enabler, Dr Opoku-Mensah referred to the role of ICT infrastructure, in particular broadband Internet infrastructure. According to Dr Opoku-Mensah, current policies were not fully acknowledging the capacity of ICTs to transform development. The current discussion on the SDGs are considering a 'fit for purpose' accountability framework for Africa, which takes into account the special needs and development status of the region. While Dr Opoku-Mensa acknowledged that the statistical community had made a number of important contributions to the current discussions on the SDGs (including through the Open Working Group's Technical Support Team's issue brief on Science Technology and Innovation) she suggested that much work remained to be done: Africa had yet to embrace the data revolution, including the use of big and open data, and statistical capacity building remained a main challenge for the region to adapt to new ICT trends and to developments in the area of monitoring. In this context, Dr Opoku-Mensah also highlighted the importance of data analysis, to fully exploit the potential of data.
24. The discussions following the panelists' statements highlighted the need to create an inclusive information society in which people were empowered to use ICTs. One conclusion of the debate was that 'the illiterate are not those who cannot read or write but those who cannot use ICTs'.
25. Following a question by the Alliance for Affordable Internet on the role of ICTs in the post 2015 DA, Professor Heeks explained that while ICTs were incorporated, the current discussions on the future DA did not adequately recognize ICTs as a platform. In line with his call to make ICTs a transformative platform for development, he highlighted the potential of ICTs to build resilience to all shocks, including environmental, but also economic and social shocks.
26. Bangladesh intervened to highlight the need to make Internet access more affordable, and to emphasize the potential of ICTs, in particular mobile applications and tools, to prevent and mitigate natural disasters. Both Iran and Namibia highlighted the need to measure ICT inclusion and accessibility to ensure that certain population groups, such as the elderly and people with special needs, are not left behind. Iran and Egypt pointed to the need to measure the impact of ICTs on social and economic developments.
27. Hon. Simataa said that while it was important to generate data, it was as important to properly analyze and understand the data to ensure that the right information feeds into policy processes. Professor Heeks confirmed the need not only for a *data revolution* but also a *praxis revolution* with an increased focus on data analysis. In addition, Professor Heeks highlighted that the impact of real-time data would be greatest if it were used for real-time decision making. He further pointed to some of the challenge

facing statisticians, including the difficulty to capture the difference between ICT users and the beneficiaries of ICTs since some non-users of ICTs could also, albeit indirectly, benefit. He also suggested that not all countries were interested in the same measures and indicators since countries were facing different challenges, which required a more flexible monitoring framework.

28. Mr Kumsishvili confirmed his government's commitment to mainstream the use of ICTs in all processes, and particularly to improve the delivery of government services and limit bureaucratic burden. In Georgia, ICTs created many new jobs and had an important spill-over effect on the economy by driving innovation and by providing a new platform of delivery.
29. Both, EUTELSAT and Intel commented on countries' influence on infrastructure developments through regulatory frameworks. Intel suggested that its experience had shown that deregulation tended to lead to more investments in last-mile infrastructure and a higher degree of innovation. In response to this, Saudi Arabia stated that regulators implemented policies to foster, not inhibit investment and growth. EUTELSAT emphasized that the satellite sector was developing solutions for easy broadband access, which could be particularly useful to connect remote and rural areas, and that it was important to monitor needs.
30. While, according to Research ICT Africa (RIA), connectivity and infrastructure remained key issues to be addressed in Africa, there was a need to tackle broader issues of human development and equality. If ICTs could fast-track development, RIA suggested that they should also be used to achieve basic rights, online as well as off-line.
31. Japan stressed the role of the government in ensuring cooperation between the large number of stakeholders involved in the ICT4D debate. In this context, Dr Sleit also emphasized the need for statistics users, the policy makers, to coordinate with the producers of statistics to ensure that the relevant information was produced and made available. He further highlighted the benefits of disseminating data openly, to widen the scope and impact on those that rely on these statistics.
32. Saudi Arabia took the floor to ask how ICTs – that have been used in many countries by revolutionary forces – can help people and countries emerging from conflicts. Mr Zavazava referred to a number of ITU Resolutions that specifically address these issues, including Resolution 34 relating to countries in special need.
33. When the panelists of the Ministerial Roundtable were asked to make a final statement, both Mr Kumsishvili and Mr Simataa raised the issue of infrastructure deployment and the role of the government to ensure that all citizens, including those in rural and remote areas, have equal access to ICTs. Dr Elshenawy highlighted the cross-cutting impact of ICTs and the role of the ICT sector in contributing to the country's economy. Dr Sleit raised the issue of big data and emphasized the need to identify the type of information and indicators that policy makers need in order to adapt monitoring processes, and to focus on collecting those data that are most urgently needed, and that can be analyzed. Mr Lehola recalled the promise of the data revolution to promote accountability and to lead to new social contracts. Dr Opoku-Mensah pointed to the new role of ICTs and suggested that countries should adapt the use of ICTs to their specific national and regional circumstances and needs.

Professor Heeks reminded the audience that ICTs alone were not sufficient, but that people had to have the right skills to own and control ICTs, so as to eventually be empowered through ICTs. Following these final interventions, the moderator recalled the importance of measurement for policy making, thanked the panelists for their contributions and input to the roundtable, and closed the session.

Launch of the Measuring the Information Society Report 2014

34. For the first time, the ITU *Measuring the Information Society Report* was launched at WTIS, during a special ceremony held on the first day and moderated by ex-BBC journalist **Ms Nisha Pillai**. During the ceremony, Ms Pillai invited the audience to comment on the usefulness of the report. She then announced the top ten performers on the latest ICT Development Index (IDI), a key feature of the Report. Special awards were given to the top IDI performers of 2013 (Republic of Korea) and 2014 (Denmark).

Big data for development and the future of ICT measurement

35. The session was moderated by **Ms Nisha Pillai**, professional facilitator and moderator. She introduced the panellists and invited **Mr Reg Brennenraedts, Partner at Dialogic *innovation and interaction***, to deliver his keynote address. In his introductory remarks, Mr Brennenraedts informed the audience that Dialogic developed big data strategies for private companies and policy makers and also used big data techniques for research and innovation purposes. They had developed a big data strategy for ITU's work on ICT statistics. The presentation provided an overview of what is understood by big data and what big data sources existed from the ICT industry, focusing on the key question of what the role of big data was for future ICT measurement. Big data could be understood in relative terms, as "too big to handle" by an organization and therefore could be a moving target difficult to capture in terms of size. Exponential growth was a core feature of big data, and of the related opportunities and analyses.
36. Mr Brennenraedts stressed that big data offered huge possibilities for producing new ICT indicators. Key ICT sector data sources included mobile devices, mobile apps, mobile payment platforms, content delivery networks, social media networks, telecommunications equipment and networks, instant messaging, and data available on the Internet. Mr Brennenraedts concluded his keynote by emphasizing the importance of embracing big data and not to miss out on the opportunities it provides for new ICT indicators. If the public sector wanted to remain the most relevant actor in global ICT data, it should take an active role. Otherwise, other actors would take this role and they would have other core values.
37. The second presentation was delivered by **Mr Ronald Jansen, Chief of Trade Statistics Branch, United Nations Statistics Division**. Mr Jansen focused on the topic of big data for official statistics, in particular the work of the recently created UN Global Working Group on Big Data for Official Statistics. He informed participants that big data was firmly placed on the agenda of the global statistical community,

which had conducted a global assessment on the use of big data for official statistics. The Global Working Group, which was created in March 2014, consisted of 15 countries and 10 international organizations (including ITU). At a recent meeting in Beijing, China, four broad groups of Big Data sources were examined, namely mobile phone data, traffic loop data, Twitter and other social media data and satellite imagery and other geo-spatial information, all of which have been successfully used. The Global Working Group would examine the link between big data, data revolution and the post 2015 development agenda, referring to the recently released report by the Independent Expert Advisory Group (IEAG) on data revolution for development entitled “A world that counts”. Mr Jansen informed the audience about the agreed work programme and deliverables of the group, which include – apart from the examination of different big data sources – also training and capacity building, advocacy and communication, and data access and building partnerships. Finally, a survey carried out by UNSD on big data strategies and projects implemented in countries revealed that most are still in the planning or execution phase, focusing primarily on demographic and social statistics as well as economic, financial and price statistics. Just more than half of the projects (58%) had partnerships with other organizations or data providers. He concluded that for NSOs, the most common type of partnership was with a data provider, followed by analytical partners. A few partnerships were with data consumers, design partners and technology partners. This indicated that access to data was the main reason for engaging in partnerships. Mr Jansen also mentioned that he hoped that ITU could help the global statistical community in fostering partnerships with the private sector.

38. **Mr Pat Wu, Internet.org Strategy & Planning Leader, Facebook**, introduced the Internet.org initiative, which was launched a year ago with the aim to bring Internet access to the two-thirds of the world who are not yet online, and highlighted that connectivity improved lives and education, created jobs, and connected families and friends. Facebook was using data in order to make better decisions in terms of improving connectivity, and was searching for the right metrics to measure impact and understand the issues that needed to be addressed to improve connectivity. Mr Wu referred to some studies Facebook had carried out with other private companies, to measure Internet user characteristics – including gender, age, income, literacy levels, urbanization – and stressed the importance of better statistics to understand who was online and who wasn’t and to better understand the impact of Internet usage. This helped Facebook find the right, sustainable business solutions and tailor their work. Infrastructure statistics were also very important to assess who had access to the networks and to different types of technologies (e.g. 2G, 3G, 4G coverage). Mr Wu mentioned that Internet.org had partnered with mobile operators, had established connectivity labs and broader alliances including with research partners and other like-minded, interested stakeholders. With respect to mobile operators, they had launched partnerships in Zambia, Tanzania and Kenya offering free basic services with the aim to help people understand better the usefulness of Internet. Services covered areas such as information news, communication, health, education and finance. With respect to network infrastructure, population density played an important role, which was low in rural areas compared to urban areas. Therefore, Facebook was exploring solutions – including terrestrial, high altitude and satellite networks – for improving access and this requires better information and data on existing infrastructure and network coverage, as well as demographic information.

39. The next speaker, **Ms Nuria Oliver, Scientific Director at Telefonica Research**, participated remotely. Her presentation addressed the topic of “Big data for social good” and focused on the question of whether and how mobile phone data could be used to better “understand aspects of human behaviour that could help improve the world”. In particular, Telefonica had carried out research using mobile data related to levels of activities in the cell towers in the outbreak of pandemics and other disasters. For example, after the earthquake in Mexico levels of activities suddenly increased and this kind of information helps to monitor the displacement of people. Also, during the H1N1 flu epidemic in Mexico three years ago, mobile data were used to assess the effectiveness of different levels of alerts put in place by the Government, by identifying the reduction in mobility among the population. The results showed that the 2nd level of alert was in fact more effective than the 3rd level of alert, which was important for policy decisions in similar cases.
40. Apart from pandemics, Ms Oliver mentioned other areas where big data could be used for social good, such as the analysis of impact of floods, crime prediction, and socio-economic status of populations. Some of the challenges that needed to be addressed include regulatory aspects (e.g. lack of guidelines regarding safe data handling), technical issues (e.g. representativeness of the data available; lack of ground truth data) and those related to privacy (e.g. need for a clear code of conduct and ethical principles). At the same time, Ms Oliver concluded that there are many opportunities that mobile phone data offered, such as to quantitatively model and understand large-scale human behaviour, predict and classify external information, enhance tools used by policy makers and provide critical information in areas like urban planning, crisis management or global health.
41. The next speaker, **Mr Gerret Wassink, Team manager, Culture, Tourism and Technology, Statistics Netherlands**, shared practical observations and the experience of his organization in using new (big) data sources for official statistics and shared some lessons learned. Statistics Netherlands started to work with big data in 2009 motivated by the possibility to reduce administrative burdens (e.g. reduce questionnaires), the will to find out more about big data, and with financial support from the Ministry of Economic Affairs. Their activities related to using big data sources included: the collection of price data for airline tickets and petrol using Internet robots (was successful but was discontinued due to high costs related to development and deployment of Internet robots); the collection of job vacancies using Internet robots (showed poor representativeness of the data, didn’t find methods to properly correct this); Internet speed measurement using a programme stored on a computer of members of a panel, done in partnership with a company already doing this (members were not representative); tracking 130 volunteer smartphone users for 1 month jointly with the Technical University of Delft (also issues of representativeness); and the study of millions of online ads on Marktplaats.nl (created some insights in characteristics of marketplace users). Some activities were still on-going, including research on the use of call detail records from mobile telecommunication providers for tourism, mobility and population statistics; and the study of 2 million Dutch websites. Mr Wassink highlighted that some of the things they learned was that using new (big) data sources was rarely a solution for budget cuts; indeed, it required substantial investments into human and technical resources. Also, big data sources should be considered as additional sources (and providing additional information) and not as sources that would replace tradition data sources. Indeed, a major problem Statistics Netherlands encountered

was the non-representativeness of the data. For example, the 100 000 volunteers (and 16 million Internet speed measurements) who participated in their Internet speed measurement exercise were mostly people who preferred high-speed connections. The main challenges were methodological and privacy-related, rather than technology-related. At the same time, private companies seek collaboration with NSOs in order to improve methodologies and data quality, which are important aspects that could be brought into the negotiations with private data providers. The NSO can help translate unstructured data sets into meaningful statistical information. In conclusion, Mr Wassink recommended that NSOs should make an effort and use big data sources, be open towards companies that have interesting data, but be realistic and explain about data quality and privacy. Telecommunication data, in particular, were very interesting sources.

42. **Professor Mark Graham of the Oxford Internet Institute, University of Oxford**, delivered his presentation entitled “Information geographies: new data sources for monitoring ICT trends, participation, and representation”. Looking at the distribution of domain name registrations, they did not reflect the distribution of Internet users across the globe, with the large majority coming from a few developed countries. Using data from Google Maps, Professor Graham’s research showed that for example there was more indexed content layered over the Tokyo-Yokohama metropolitan region than over the entire African continent. Based on extensive analysis of data available on the Internet, he illustrated that, for example, content and knowledge was distributed unevenly across the world. Even though Internet access and penetration increased significantly in many regions, and in view of the fast increase in network rollout and broadband uptake, Internet content (in particular, history content) remains very euro-centric, based on an analysis of the distribution of Wikipedia articles by origin and of Google-indexed content. Research using data from OpenStreetMap showed that 2/3 of the content created came from only five countries in the world. In addition, the large majority of languages used on the Internet were European languages. A key finding of this research was that the unevenness of the distribution of content did not reflect the unevenness in Internet usage or connectivity. He highlighted that the results obtained from using big data sets in one place were not necessarily transferable to another place. Therefore, a final conclusion drawn by Professor Graham was that what new data sets - such as those related to big data – do not tell us was equally important as what they do tell us about the world.
43. In the subsequent discussion, the delegate from Japan inquired about the resources needed to carry out big data analytics. Another question concerned the huge possibilities of big data in many sectors, and how to make best use of big data. Mr Brennenraedts stressed that a good understanding of the main ecosystem related to a specific sector was necessary, including knowledge on who the most important parties were, who had collected information, or where the data were stored. Furthermore, big data should not be considered as a substitution for existing indicators but to obtain more insights on the issues.
44. The moderator pointed to the limitations of the mobile networks which were not available everywhere in the country (e.g. in Ebola-affected Guinea). Ms Oliver agreed that this was one of the limiting factors of using mobile phone data, namely the representativeness of the data, and that it was necessary to look at mobile phone penetration rates, which could be different across countries. Still, she stressed

that mobile data were the most pervasive and therefore offered major opportunities for big data. Mr Jansen complemented by recalling that there were many complaints related to the data used for monitoring the MDGs, such as the untimeliness of the data; by using big data we could contribute to improving not only the timeliness but also the frequency of the data and mobile phone data could help a lot.

45. The delegate from the Republic of Korea informed participants that they were facing problems with big data due to privacy issues and were wondering how to go about this, in particular how to protect privacy. Mr Gerrit mentioned that Statistics Netherlands had strict measures in reporting every research they conducted in terms of possible problems with privacy. Indeed, they were even stricter with privacy than the people who were being monitored. As a result, they had not faced any problems so far with respect to privacy issues. Ms Oliver agreed that privacy was a potential concern but highlighted that completely anonymized data such as levels of activities from cell towers could provide valuable information and be of huge public policy value. Mr Wu confirmed that Facebook was taking the issue of privacy very seriously, adding that it also depended on the specific goal, e.g. in the area of tourism, many countries had put content on Facebook pages that was open to others to discover their countries. People could choose their levels of privacy and how much they would like to share. Finally, a question was raised about the use of big data when carrying out national surveys and possible inconsistencies that could occur from using public versus private sector data. Mr Jansen highlighted that big data can supplement existing surveys and that the statistics community should work more with private companies and make use of apps to access data, which would eventually also help building trust.
46. The moderator thanked the panellists for their excellent contributions and handed the floor back to the delegated Chair of WTIS, who thanked the moderator for her excellent facilitation and the panellists for their interesting presentations.

Measuring competition, regulation and affordability of ICT services

47. The panel was moderated by **Mr Aaron Boyd, Chief Strategy Officer of ABI Research**. In his introductory remarks, Mr Boyd mentioned some of the salient trends in telecommunication markets according to ABI Research: in fixed-broadband markets, the slow-down of DSL and the exponential growth expected in FTTx deployments in the next five years; the decrease in average revenue per user and therefore the reduction of operators' profits, particularly in countries with a large DSL customer base; the increase in the offer of over-the-top Internet service providers (OTTs); customer demand for unlimited data plans; and issues related to net neutrality.
48. The moderator asked the first panellist, **Dr Tommaso Valletti, Professor at the Imperial College London**, about the academic findings on how regulatory and policy interventions affected competition and prices in mobile-cellular markets, as well as the data required to assess this impact. Professor Valletti made the point that part of the current discussions focused on the role of OTTs, but that OTT services were only

accessible through telecommunication networks, such as mobile-cellular networks, and therefore the discussion of the regulation of mobile-cellular markets remained central in the light of the new trends.

49. Professor Valletti talked about the main drivers of competition *for* the mobile market, such as spectrum allocation and assignment, and market entry. Referring to the latter, he highlighted that mobile markets had the rather unique characteristic of limiting the entry of new players because of the licencing regime, and that in most cases a situation of duopoly/triopoly was assured for a long time. Mr Valletti also discussed the main drivers of competition *in* the mobile market, such as mobile termination. He mentioned the possible waterbed effects that the regulation of mobile termination could have on other mobile prices, although the most recent research suggested these compensatory effects were minimal in competitive markets. He also highlighted the lack of strong evidence on the effects of mobile virtual network operators (MVNOs) in mobile markets, and he advised against forcing operators to apply unified on-net/off-net pricing schemes. Regarding data requirements, Professor Valletti discussed the pros and cons of a basket approach for benchmarking prices at the international level. In particular, he noted that a basket approach allowed better cross-country comparisons, but that it relied on hypothetical usage assumptions, rather than real data per country, which he suggested that could be obtained from micro data from consumer profiles.
50. The moderator asked the next panellist, **Ms Sonia Jorge, Executive Director of the Alliance for Affordable Internet (A4AI)**, to share her experience as an ICT policy and regulatory advisor in over 20 countries worldwide on the relation between regulation, competition and affordability. Ms Jorge stressed that affordability remained the single most important barrier for ICT uptake and to illustrate this she mentioned the findings of a recent report from A4AI covering 46 countries. The report found that 2 billion people lived below USD 2 per day and concluded that entry-level prices representing less than 5 per cent of GNI per capita (as in the target set by the Broadband Commission for Digital Development) would not be enough to connect all the unconnected. Ms Jorge noted that although competition had proven to drive prices down it was not the silver bullet, as it had been demonstrated in many developing countries that had introduced competition and yet prices had not decreased enough to make services affordable for all. Ms Jorge proposed that regulation and policies should incentivize operators to work together in issues such as infrastructure sharing, spectrum management and effective usage of universal service funds. In addition, Ms Jorge pointed out that regulatory and policy initiatives should focus on the entire value chain, and not just on infrastructure. She also highlighted that monitoring was the key to guide these efforts and that policy-makers should be responsible for obtaining data on the whole ecosystem (demand- and supply-side) in order to assess the impact of the initiatives undertaken.
51. The moderator underlined the correlation between connectivity and socio-economic statistics and asked Ms Jorge about the causality between connectivity and development. Ms Jorge explained that A4AI saw ICTs as a way to promote development, and because of this, there was a need to go beyond the issues of affordability: the unconnected communities would need to understand the use of ICTs and embrace them. Ms Jorge advocated more demand-side measurements and policy initiatives, and gave the example of Africa, where income and education were the two main factors that determined the impact of ICTs.

52. **Mr Juan M. Roldan, Senior Technical and Economic Advisor at TMG** addressed the question from the moderator on the impact of spectrum management on competition, regulation and ultimately on prices. Mr Roldan highlighted that in a moment where mobile broadband was leading ICT growth, effective allocation of spectrum to services was crucial. He remarked that policy makers needed good information on the technological trends and their timing worldwide, because these trends determined economies of scale that depended on global data. Mr Roldan recommended assignment procedures that allowed the entrance of new players, particularly when the incumbent also took part in the process, and underlined the need for very detailed measurements to make the right decisions in terms of spectrum. Mr Roldan mentioned a number of regulatory measures that could be undertaken to promote efficiency, such as encouraging spectrum sharing, infrastructure sharing or MVNOs. Mr Roldan also highlighted the importance of quantitative market analyses which required data on market shares, spectrum concentrations, prices, trends in the past years and even micro data.
53. When the moderator asked Mr Roldan what quantitative data were used to decide on spectrum reallocation, he acknowledged that this was a difficult topic, and that such decisions should be based on cost-benefit analysis encompassing the community as a whole.
54. The next panellist, **Mr Elidier Moya, Manager of Networks in Telecommunications at the Ministry of Science, Technology and Telecommunications in Costa Rica**, provided an overview of the case of the deregulation of the mobile market in Costa Rica. The law was approved in 2008 and entered into effect in 2011, when the new entrants started offering services and the regulator was created. Competition brought new service in the market, such as prepaid mobile services that were previously unavailable. Mr Moya explained that broadband prices were regulated but market prices were more than 50 per cent below the regulated prices, and even more in the case of high-speed offers. A similar situation occurred in mobile markets. Mr Moya closed his intervention by noting that telecommunications represented 2 per cent of GDP in Costa Rica.
55. Ms Jorge took the floor to comment that ITU and other institutions collected data on the impact of some initiatives on prices, such as reduced taxation in some ICT equipment or services in Colombia and Kenya. Ms Jorge highlighted the importance to extend these case studies to other countries in order to allow for cross-country comparisons on the impact of some initiatives. She also mentioned the Affordability Index produced by A4AI, which identified affordability drivers and benchmarked countries on how advanced they were in applying international good practices for these drivers. Mr Moya took the floor to point to the lack of data at sub-national level on the purchasing power of specific communities, and noted that these data were needed to design targeted policies. Mr Roldan intervened to clarify that affordability could be broken down into different elements, such as the cost of the device and the monthly payment. He further explained the case of Colombia, where tax exemptions on computers led to doubling the computer penetration in two years. Mr Roldan noted that part of the taxes exempted were recovered through more service fees, and concluded that high taxation, such as luxury fees applied to smartphones, should not be applied to ICT equipment.
56. The moderator asked Professor Valletti how the data gaps in developing countries could be filled in order to advance towards evidenced-based policy-making. Mr Valletti agreed that data from developing

countries were missing, even regarding basic information, such as the existence of an independent regulator in a country. However, a lot of information was available thanks to quasi natural experiments at the regional level, e.g. how mobile phones helped the fisheries industry in India; or what impact M-pesa had in the financial industry in Kenya. Mr Valletti commented that national statistical offices (NSOs) were collecting some specific data on these phenomena that together with market data could be used for robust impact analyses.

57. Following the panellists' interventions, the moderator opened the floor for comments and questions. Uganda asked how OTTs should be considered in terms of regulation and competition *vis-à-vis* telecommunication operators. Mr Valletti answered that OTTs were changing the ecosystem in such things as pricing of voice services or messaging, but access to OTT services still depended on access to a telecommunication platform. According to Mr Valletti's view, there was no particular need for specific regulation of OTTs.
58. A Georgian operator asked the panellists on any analysis of the impact on prices of the current regulation in Georgia, particularly regarding the taxation regime. Mr Valletti and Ms Jorge answered that they were not aware of any studies, but Ms Jorge mentioned that Georgia could be included in the countries studied by A4AI in the future if there was an interest from the country. The Georgian operator commented that data on Georgia were available but analysis was lacking, and welcomed Ms Jorge's proposal.
59. Research ICT Africa (RIA) took the floor to highlight that academic analyses to challenge industry interests with real case data were lacking in Africa. Based on the evidence from developing countries, RIA remarked that the problem was not only regulation but also its effective implementation, particularly in Africa. RIA explained that the no regulation of telecommunication markets in Africa had been the norm in the past, and that prices had only decreased when some regulation started to be implemented in the region, such as for instance the regulation of mobile termination rates. Regarding future challenges, RIA mentioned that it was important to start preparing the regulation of data services and listed some bottlenecks that required further study, such as bandwidth constraints and peering agreements. RIA concluded the intervention by mentioning that a basket approach was the most suited for comparing prices across countries and to avoid comparing apples with oranges.
60. The moderator expressed his view that regulators had difficulties in thinking across ecosystems and including OTTs in their analyses, and asked the panellists to elaborate on how public-private partnerships compared to private-private partnerships mandated by regulation. Mr Roldan explained that the Colombian administration had carried out a study to determine how much would it cost to bring broadband to every place in the country, and that it planned to roll out a shared infrastructure (commissioned through a bidding process) that would be financed 50 per cent by the Government and 50% by all private operators. Mr Roldan noted that some regulation was necessary even in public-private partnerships, for instance to ensure the transparency of the process.
61. Saudi Arabia stressed the role of governments in cases of market failure, and inquired about the right balance between the interests of supply and demand, particularly regarding prices, return on investment and quality of service. Regarding OTTs, Saudi Arabia expressed the view that ITU should set good rules to

ensure that no distortion of the market that could harm consumers would arise. ITU took the floor to mention that Chapter 4 of the Measuring the Information Society Report 2014 was devoted to the analysis of ICT prices and the role of competition and regulation in shaping them.

62. The Republic of Korea explained that very high competition levels had been achieved in their mobile market with only three operators, and asked the panellists on methodological recommendations for international price comparisons. Botswana took the floor to ask why broadband prices were still so high, and what could be done to bring the services to the communities that were not yet served.
63. The panellists took the floor to answer the various questions received from the floor. Ms Jorge stated that there were clear international best practices on tariff regulation, such as the use of long run incremental cost (LRIC) models to determine costs and regulatory intervention if prices were too high above margins. Ms Jorge remarked that for such analyses very detailed regulatory data were necessary. Mr Moya commented that after three years of competition in the mobile-cellular market, penetration had increased from 90 to 150 per cent in Costa Rica, mainly due to the increase in prepaid accounts, which contributed to making mobile-cellular services affordable to low-income segments of the population. Mr Valletti explained that high prices could be caused by supply-side factors, such as the high cost of offering the service in some areas or the lack of competition in the market. The burden of proof should be on the regulator's side when determining a market failure. On the demand side, the service could be unaffordable because of low income. In that case, universal service funds or subsidies to the users (not to the companies) could be considered, depending on the resources and the opportunity costs that such an initiative would represent in comparison with other national priorities, e.g. in the area of education or health.
64. The moderator mentioned the case of Indonesia and the effort made to connect the different islands in the country. Indonesia took the floor to explain how they had opened up the market and used universal service funds to roll out infrastructure. Ms Jorge suggested that money from universal service funds could also be used to carry out household surveys to obtain richer information on the population not yet connected and the barriers to ICT uptake, and thus better use the resources available for digital inclusion initiatives (e.g. on digital literacy, targeted support for women, entrepreneurs, etc.). Mr Moya supported the points made by Ms Jorge and explained that in Costa Rica the NSO and the regulator had worked together during the definition of the broadband plan, and that granular data from the NSO had been useful to design targeted policies. Mr Roldan mentioned Intel's initiative "Reaching the Third Billion" to help increase Internet use, and how affordability was determined by the total cost of ownership (75 per cent corresponding to the monthly fee, 20 per cent to the device and the rest to other fees, such the installation charge). Having found that the total cost of ownership was below the income available in some countries, Intel led a partnership between different stakeholders to produce low-cost computers (below USD 200), packaged together with affordable prepaid broadband plans and relevant software.
65. The moderator thanked the panellists and handed the floor back to the Delegated Chair of WTIS, who closed the panel after thanking the panellists and the audience for their insightful comments and questions.

Current and future work on telecommunication/ICT Indicators

66. The session was moderated by **Mr Rati Skhirtladze, Head of the Information and Analysis Department at the National Communications Commission of Georgia**. Mr Skhirtladze introduced the work carried out by the ITU Expert Group on Telecommunication/ICT Indicators (EGTI) and mentioned two areas of future work on telecommunication/ICT indicators: m-banking and additional sources for administrative data, such as big data and OTT services.
67. The first presentation was delivered by **Mr Iñigo Herguera, Deputy Director of the Statistics Division of the National Markets and Competition Commission in Spain, and the current EGTI Chair**. Mr Herguera highlighted the high participation registered in the 5th EGTI Meeting held on 17-18 September 2014 in Geneva, with 92 participants from 48 countries, including representatives from regulators, ministries, national statistical offices, regional and international organizations and operators. Mr Herguera explained that the 5th EGTI Meeting was organized for the first time back-to-back with the meeting of the Expert Group on ICT Household Indicators (EGH), and that this created synergies between both groups, as illustrated by the joint EGTI and EGH session organized on 17 September in Geneva.
68. Mr Herguera presented the outcomes of the 5th EGTI Meeting. EGTI concluded that fixed-broadband services for public and private organizations had different characteristics than residential fixed-broadband services and, therefore, agreed that ITU starts collecting from 2015 separate fixed-broadband subscription data for organizations. Mr Herguera clarified that the collection of data on fixed-broadband subscriptions for public and private organizations would not alter the indicator “fixed-broadband subscriptions”, but rather complements it.
69. Mr Herguera noted the increasing importance of machine-to-machine (M2M) services and bundled telecommunication services, as well as the roll-out of LTE and other advanced mobile networks in several countries. To monitor these trends, EGTI agreed that ITU starts collecting, as of 2015, data on M2M subscriptions, coverage of LTE and other advanced mobile networks and bundled telecommunication subscriptions, according to three categories: (i) mobile voice and mobile broadband; (ii) fixed broadband and fixed telephony; and (iii) fixed telephony, fixed broadband and pay TV. EGTI also revised the classification of broadband services and decided that it would be changed to a fixed/mobile categorization, from the previous wired/wireless classification.
70. Regarding the indicator “International Internet bandwidth”, EGTI noted that data reported by different countries were not based on the same definitions. With a view to improving international comparability, EGTI agreed to replace the indicator with two indicators more precisely defined: “Lit/equipped international Internet bandwidth” and “Used international Internet bandwidth (traffic)”.
71. Mr Herguera presented the revision of the list of indicators included in the ITU World Telecommunication/ICT Indicators Long Questionnaire, and listed the 17 indicators identified by EGTI as no longer relevant at the international level, and for which ITU would discontinue the data collection. Mr Herguera explained that the ICT Development Index (IDI) had been discussed in the joint session with EGH,

with a focus on the following points: the feasibility of producing an indicator on unique mobile phone subscribers and the proposal by the UNESCO Institute for Statistics (UIS) to improve the IDI Skills sub-index. Mr Herguera concluded the report of the 5th EGTI Meeting by enumerating the topics proposed for future discussion in EGTI: the revision of the 2011 ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT; additional sources for administrative data (big data, OTT); indicators on fixed-broadband services in public and private organizations (carry over); sub-categories of mobile-broadband subscriptions (carry over); and subscription data on advanced mobile-broadband technologies (LTE and plus, carry over). The IDI would also be maintained as a standing item for discussion in EGTI.

72. The second presentation was delivered by **Mr Bogdan Vasilescu, Head of the Statistical Data Unit at the National Authority for Management and Regulation in Communications (ANCOM) in Romania**, who provided an overview of the data collection on bundled telecommunication services in Romania. Mr Vasilescu explained that evidence from household surveys showed that the uptake of bundled telecommunication services had increased significantly in Romania, e.g. 40 per cent of households contracted fixed telephony as part of a bundle in 2008 compared with 60 per cent in 2010. As a result, there was a need to monitor these services for market analysis purposes and for reporting on the telecommunication sector.
73. Mr Vasilescu explained three concepts that were used to classify multiple telecommunication services in Romania: bundles, tied services (services only available if contracted together with others) and multiple services (two to five services contracted separately from the same operator). Mr Vasilescu commented that data on bundled telecommunication subscriptions were collected from operators bi-annually for 26 possible categories combining fixed telephony, mobile telephony, fixed broadband, mobile Internet or pay TV, and that data broken down by residential/business and urban/rural were available. Mr Vasilescu mentioned that data on bundled telecommunication services were also collected based on end-user surveys periodically conducted by ANCOM, which complemented the data reported by operators.
74. The third presentation was delivered by **Mr Wilfred Ojok, Market Industry Analyst at the Uganda Communications Commission (UCC)**. Mr Ojok presented Uganda's experience in measuring m-banking services. He presented the different types of mobile financial services offered in Uganda and noted that mobile money was the most popular one. Mobile money began as a value added service and a customer retentions mechanism, and then grew into a tool for financial inclusion. Mobile money could be technically defined as "unstructured supplementary service data (USSD) and SMS based service using a SIM as the repository of e- Value or as the e-Wallet".
75. Mr Ojok explained how the mobile money ecosystem worked and clarified key terms such as "mobile money transaction", "mobile money agent", "mobile money deposit" and the differences between registered and unregistered users. Mr Ojok described the indicators collected in Uganda to monitor the mobile money market: number of mobile money agents, number of banks partnering with MNOs, number of registered mobile phones, value and number of mobile money transactions, balance on customer accounts and value of outstanding remittances. Based on the data already collected, Mr Ojok showed that mobile money subscriptions were growing faster than mobile-cellular subscriptions; mobile money service points had doubled in 2012-2013 and they largely outnumbered bank branches and ATMs; there

were three times as many mobile money accounts than bank accounts, and mobile money accounts were growing at a very fast pace. Mr Ojok concluded by signalling the development potential of mobile money, and some of the measurement challenges, such as the coordination needed between UCC and the Bank of Uganda to monitor these services.

76. The fourth presentation of the session was delivered by **Mr Erki Saluveer, Chief Technology Officer at Positium**, who showed how mobile positioning data could be used as a new source for administrative statistics. Mr Saluveer stated that given the widespread usage of mobile-cellular services and the geographical footprints that they generated in the databases of mobile network operators (MNOs), the data could be processed to produce aggregated statistics related to mobility. Mr Saluveer showcased the experience in Estonia, where the Bank of Estonia had switched to using MNO data for the production of the tourism statistics necessary for the balance of payments, e.g. number and lengths of visits, country of origin, etc. This had rendered advantages in terms of lower costs, better representativeness, higher frequency, more granularity and easing the reporting burden on tourists.
77. Mr Saluveer mentioned that mobile positioning data were already being used to produce societal statistics in more than 17 countries, including Brazil, Ireland, Japan, Mexico, Sri Lanka and the United States. Nevertheless, some challenges remained for making full use of these data. Mr Saluveer highlighted that ITU could help in establishing a common framework, so that it would not be necessary to discuss on a case-by-case basis with each operator. He also mentioned that national statistical offices had the statistical skills to process the data, but they did not have the legal basis to collect them. To conclude the presentation, Mr Saluveer pointed to the priority issues to be addressed: access to the data (legislation and ownership), privacy protection aspects and methodological issues of processing data from highly sensitive areas, and representativeness of the data (cultural, socio-economic and geographical, treatment of M2M).
78. The round of questions from the floor was opened by the delegate from Azerbaijan who asked Mr Ojok whether there was not an overlap in the statistics on m-banking services produced by UCC and those produced by the Bank of Uganda. Azerbaijan also asked Mr Saluveer about how double SIM cards were considered in the processing of mobile positioning data, and how the information of the original country of the tourist was retrieved. Mr Ojok clarified that the Bank of Uganda was responsible to oversee the financial services offered through m-banking, and UCC was in charge of regulating the technological platform, and that both institutions worked together to define a common regulatory approach. Mr Saluveer explained that they had developed an algorithm to identify double SIM cards in order to remove them from the statistics, and that data on the country of origin could be obtained from the mobile country code of the customer, as well as based on behavioural patterns.
79. Kenya shared their experience in the collection of data on m-banking services. Four MNOs were offering these services and the market was very innovative; extra value added services, such as loans, were being developed and MNOs were partnering with banks. Regarding the roles of the different administrations, the approach was the same as in Uganda: the Central Bank of Kenya oversaw the financial services, the Communications Authority of Kenya took care of the licences and both institutions were working together to develop a common approach.

80. Saudi Arabia inquired about the risks linked to the quality and security of m-banking transactions. Mr Ojok answered that UCC was looking into possible frauds linked with m-banking services. Being a new area, they were analysing these issues together with the Bank of Uganda in order to propose a common approach to security issues. Regarding the sustainability of the business model, Mr Ojok stated that the business was stable from the point of view of mobile operators.
81. Intel took the floor to support the contribution made by UIS to improve the IDI Skills sub-index and proposed that, in 2015, EGTI should work on the two indicators identified by UIS: learner-to-computer ratio and gross enrolment ratio in programmes with computer-assisted instruction. Chad commented that using only mobile positioning data for tourism statistics might lead to an underestimation of tourists because of those not subscribing to mobile-cellular services. Kazakhstan asked who regulated m-banking services in Uganda, and Mr Ojok answered that regulatory tasks were shared between UCC and the Bank of Uganda.
82. Egypt intervened to acknowledge the work carried out by EGTI in 2014, and suggested that the definition of the new indicator on M2M should not be restricted to the reality in OECD countries, but also consider the situation in developing countries. Egypt further proposed that the indicator “Dedicated mobile-broadband subscriptions” should include only USB and dongles, and seconded the proposal from Intel to consider the two indicators identified by UIS for the IDI Skills sub-index. Jordan took the floor to express the concern that the data collection on OTT services was lagging behind, and proposed to speed up the process to incorporate these indicators in the regular data collection. Kenya wondered whether it would be possible to use positioning statistics to measure people going to cities during daytime.
83. Bangladesh asked Mr Vasilescu to clarify who submitted the data through the electronic data collection system, and Mr Vasilescu explained that operators submitted the data using an electronic signature. Madagascar inquired whether operators providing m-banking services paid regulatory taxes. Mr Ojok answered that, in Uganda, there was a common regulatory system for m-banking services and therefore there was no special tax for mobile money services apart from that set by the Bank of Uganda. Saudi Arabia took the floor to support the proposal from Intel to consider the indicators proposed by UIS for the IDI Skills sub-index, and seconded the point made by Egypt on the definition of M2M services. In addition, Saudi Arabia asked how someone could use m-banking services without a bank account, and Mr Ojok clarified that anyone with a valid SIM card could go to an agent and register for mobile money services; the procedure requiring only some basic information on the customer. Mr Vasilescu replied to a question from Kazakhstan by explaining that bundled telecommunication subscriptions were broken down between urban and rural areas based on the classification of the NSO of urban/rural, as applied to the address indicated in each subscription.
84. The moderator took the floor to summarize the agreements reached by EGTI: the new indicators to start collecting from 2015, the indicators identified as no longer relevant at the international level and the items for future discussion proposed by EGTI, to which the topic of indicators on m-banking services would be added in view of the discussion in the session. The moderator asked for the endorsement of the work of EGTI in 2014 and the items proposed for future work and, as there were no further comments, the proposals were considered as accepted by the Symposium.

85. The moderator thanked the presenters and handed the floor over to the Delegated Chair of WTIS, who closed the panel after thanking the audience for their many comments and questions.

Current and future work on ICT household Indicators

86. The session on the current and future work on ICT Household Indicators was moderated by **Ms Alison Gillwald, Executive Director of Research ICT Africa (RIA)**. Ms Gillwald introduced the topic of the session by illustrating the importance of demand side data for policy makers. She stressed that the richness of these data lied in their ability to provide information on the users and the uses of, but also bottlenecks and barriers to, ICT uptake. Ms Gillwald emphasized the importance of the work carried out by the ITU Expert Group on ICT Household Indicators (EGH) and invited the EGH chair, **Mr Alexandre Barbosa, Head of the Center of Studies for Information and Communication Technologies in Brazil** to present the outcomes of the 2nd EGH meeting.
87. Mr Barbosa recalled the objectives and working methods of the EGH and provided a detailed overview of the discussions that took place at the last EGH face-to-face meeting, in September 2014. He presented the outcomes of the review of existing indicators and the definition of new indicators. Mr Barbosa highlighted that a changing ICT environment and changes in the way people and household ICT access and use required a constant revision of indicators. While the EGH had agreed on several new indicators and their definitions, the work on some other, and often more complex, indicators continued.
88. The EGH agreed on the definition and response categories of the new indicator ‘individuals using the Internet by type of portable device and network used to access the Internet’ and on the indicator on the ‘proportion of individuals who own a mobile phone’. The Chair emphasized that the latter indicator provided very different information than the indicators on mobile phone users and mobile-cellular subscriptions, and that it was particularly relevant for policy analysis related to gender. Two other indicators with a high relevance for policy purposes but - according to the discussions in the EGH - difficult to measure and agree upon were the indicators on Internet security and child and youth online protection. Since the group did not reach agreement on these two indicators, the Chair explained that they would not yet be included in the ITU household questionnaire but remain open for discussion in the EGH forum. He suggested that countries interested in collecting data on Internet security and child and youth online protection could refer to model questions from existing surveys, carried out by some countries, and Eurostat. Another important indicator that Mr Barbosa reviewed was the indicator on ‘barriers for individuals not using the Internet’, for which the response categories should be in line with the existing core indicator (HH14) on ‘barriers to household Internet access’. Discussions on this indicator and its response categories will continue in the EGH forum. Finally, Mr Barbosa addressed the indicator on ICT employment, which continues to be discussed in the EGH forum, and the topic of data quality, for which a new discussion item was created. Work on data quality could also be reviewed in light of the new ITU data quality assurance framework.

89. Apart from the above mentioned indicators that remain under discussion in the EGH, Mr Barbosa presented the proposed future topics for discussion in the EGH, including methodological issues (related to data collection tools, processes, standards, data verification, dissemination), big data, national coordination, e-health, and ICTs in education. The EGH Chair ended his presentation by inviting all interested participants who are not yet part of the EGH, to join the online forum.
90. The next presentation, by **Ms Esperanza Magpantay, Senior Statistician in the ITU ICT Data and Statistics Division and Joss Gillet, Senior Manager with GSMA Intelligence (GSMAi)**, introduced a joint effort by ITU and GSMAi to improve data on mobile phone uptake and use. Ms Magpantay highlighted that while globally mobile-cellular penetration had reached close to 100 per cent, these data referred to SIM cards rather than measuring the number of mobile phone users, or mobile phone ownership. To adequately measure the uptake, use and spread of mobile services, Ms Magpantay suggested that it was necessary to develop new indicators, and to collect data on, for example, unique subscribers, which would refer to *a person* who has one, or multiple, subscriptions. Other useful indicators include mobile phone users, which refers to persons that could be using their own, or someone else's handset, and mobile phone owners. Ms Magpantay stated that to produce better data, ITU and GSMAi were looking into ways of cooperating, and to combine information from their respective data providers, which in the case of ITU are the telecommunication regulatory authorities and the national statistical offices.
91. Mr Gillet complemented the ITU presentation by providing further information on the kind of data that GSMAi produces and on the industry association's main data sources, which are the operators. In addition, GSMAi collects consumer data through surveys that are carried out by private companies. Like ITU, it has looked into the possibility of using new data sources, including big data from mobile operators, to complement its data collection. Mr Gillet went into some detail to describe the GSMA's database, which includes a large number of administrative/supply-side data, and some demand side data. He explained that GSMAi collected data from over 1000 operators and 3500 networks, that data were aggregated at the country level and that in addition it had carried out consumer surveys in 44 countries worldwide, both developed and developing countries. These surveys had been used to produce an estimate on the number of mobile Internet subscribers and on unique mobile subscribers. According to GSMAi, there were major differences between the number of mobile-cellular subscriptions (or SIM cards) and unique subscribers. In China, for example, GSM data suggest that for every unique subscriber, there were an average of 1.76 SIM cards. Mr Gillet confirmed GSMAi's intention to work with ITU to produce better data on (unique) mobile-cellular subscribers, mobile ownership and use, and mobile broadband services, through the harmonization of methodologies and definitions, closer cooperation with the NSOs, and the use of internationally agreed indicators and standards. He also mentioned that ITU and GSMAi were looking into ways of working together on big data, and possibly preparing a joint paper.
92. The moderator highlighted the challenges in producing sound data and the importance of demand side data and studies, not only to complement administrative data, but also to test models and to analyze supply-side data. She then gave the floor to the next presenter, **Ms Alvina Kwan, Senior Statistician from the Census and Statistics Department in Hong Kong, China**, to talk about measuring barriers to

ICT use. Ms Kwan first provided an overview of the ICT household survey, which Hong Kong, China, carries out every two years. She explained that the survey showed an important increase in the number of households with a computer and with Internet access, which reached around 80 per cent by 2012 for both indicators. She clarified that data from this survey had been used to evaluate specific government policies - including the funding of ICT equipment – to increase household ICT access and use, and that there was a need to find out more about those households that were not yet using ICTs. To this end, a question on barriers was added to the survey. It showed that among those 20 per cent of households that did not have a computer at home, over 60 per cent stated that they did not intend to purchase a computer, with most explaining their choice with a lack of skills. The main reason for not connecting an existing computer to the Internet was a lack of necessity (51%), and a lack of skills (22%). Sixteen per cent stated that they had no interest in using the Internet. The survey also showed that specific characteristics of people living in the households had an influence on ICT uptake, with the elderly, people with disabilities and ethnic minorities showing lower levels of ICT access and use. The cost of a computer remains a concern for about 7 per cent of households, with a larger proportion of households with low income levels without a computer.

93. The last presentation was made by **Ms Carmelo Javier Muñoz Ruiz, Director at the Spanish National Observatory for Telecommunications and the Information Society**, who discussed household survey questions on security, mobile use, and barriers to Internet use. Mr Muñoz Ruiz explained that Spain had carried out a survey to understand the difference between people's perception and the reality in terms of ICT security, and the types of security measures that people took. This included questions on the kind of software that people had installed, as well as non-automated measures, such as the encoding of documents and the use of passwords. While Spain has set up an inter-ministerial working group on child online protection it had not yet carried out a survey on this topic. In 2013, Spain had also carried out a survey to understand mobile ownership, and to look at the type of mobile device and the type of network that people used to access the Internet. Results were broken down by individual characteristics, including income level, educational attainment, employment status, etc. A survey aimed at identifying barriers to Internet uptake in Spain showed that 60 per cent of households that did not have Internet access at home stated that they did not need the Internet. Another 39 per cent indicated that they did not have the necessary skills. According to Mr Muñoz Ruiz the survey showed that cultural bias and the lack of skills were greater barriers to ICT use than costs.
94. When the moderator opened the floor for questions and comments, Indonesia inquired about specific guidance on survey questions and methodologies. Spain offered to share the methodology of its Internet security survey. The EGH Chair indicated that the topic of Internet security was one of the agenda items on the EGH forum and that countries could also refer to the Eurostat model which was currently being finalized. Sweden confirmed that Eurostat was working on the topics of privacy and the protection of personal identity and that the Eurostat model survey would be available in March 2015. Egypt highlighted the importance of measuring Internet security and mentioned the OECD's work on the topic. Egypt also highlighted the importance of close cooperation between policy makers and NSOs.
95. Iran suggested that measuring barriers to ICT uptake was currently one of the most important topics and to define policies on digital inclusion, it was important to distinguish between access and use

barriers. Iran highlighted that often people did not have the necessary skills, or thought that they did not need Internet access and that increasing awareness about the benefits of the Internet and the level of skills were very important. Brazil reminded participants that the topic was currently discussed on the EGH forum.

96. In terms of monitoring mobile phone service and uptake, a number of participants expressed their support for the joint ITU/GSMAi project and some, including Chad, China and Saudi Arabia, requested clarification on GSMAi's survey and unique mobile subscriber data. GSMAi highlighted that subscription figures did not refer to use or ownership and that better metrics were needed to measure uptake of mobile services, including use of the Internet. Mr Gillet also offered to share GSMA's methodology on estimating data on unique mobile subscribers.
97. DevSTAT suggested the EGH include a repository of model questionnaires, covering a variety of topics, including those that had not yet been added to the core list of indicators, or the ITU household questionnaire. This would allow countries to exchange experiences, provide guidance, and to avoid the duplication of work. The EGH Chair welcomed this suggestion and proposed to add this comment on the EGH forum, for follow-up. He also invited all participants to join the EGH forum, and to share their model questionnaires.
98. The moderator congratulated the EGH on its work, which was helping to improve the measurement of the information society and to better understand ICT access and use. She highlighted the importance of household survey data, for example to monitor Internet security and barriers to ICT uptake, and invited more countries to collect ICT data through household surveys. At the same time, she highlighted the need to complement often incomplete and outdated household/survey data with alternative data sources and welcomed the ITU/GSMAi project in this area. The moderator ended the session by inviting all to engage in the EGH forum and by thanking the speakers, and the audience, for their active participation.

Data quality, big data, open data

99. The session was moderated by **Mr Ronald Jansen, Chief of the Trade Statistics Branch at the United Nations Statistics Division**. He introduced the topic of the session and passed the floor to the first presenter, **Mr Michael Colledge, Consultant to ITU**, to present the ITU Data Quality Assurance Framework.
100. **Mr Colledge**, who prepared a Data Quality Assurance Framework specifically to evaluate and improve ITU's work in the area of ICT statistics, explained that this framework had made extensive use of official and recognized statistical principles and texts that exist, including several produced by the UN Statistical Division. The presentation highlighted the benefits of a quality assurance framework, which included the identification of quality problems, an increase of transparency in processes, and a higher degree of user confidence and trust. Mr Colledge also highlighted some of the challenges that ITU was facing in terms of its ICT statistics work, including the rapidly changing ICT environment, non-response by data providers, and the shortage of resources.

101. Based on a review of the two main dimensions of quality – data quality and process quality – Mr Colledge made a number of specific recommendations to improve the relevance, accuracy, credibility, coherence, timeliness, accessibility, interpretability, methods and systems and cost-efficiency. In terms of data relevance, Mr Colledge suggested that ITU analyzed its current set of data by examining user requests that currently could not be addressed, and conducted an analysis of existing and potential new users. While ITU had relatively little influence on the accuracy of the primary data (that are produced and provided by countries), it could keep a record and classify the most common errors to identify those data providers that most urgently needed ITU’s support. ITU’s level of credibility could be further raised by publishing information on how it collects, verifies and edits data, and ITU should consider distributing all of its data, including the WTI database, for free, so as to increase the level of accessibility and use. In order to improve the interpretability of ITU’s data, Mr Colledge recommended the development and publication of information on the procedures by which ITU collects, processes and analyzes its statistical output. Finally, to improve the process quality, ITU could ask its data providers, in particular the national statistical offices (NSOs) and the national regulatory authorities (NRAs), to provide additional metadata. Linked to this, Mr Colledge also recommended raising the awareness of the need for data quality self-assessments amongst ITU’s data providers.
102. The following discussions from the floor, including interventions from Brazil and the Republic of Korea, showed support for the work that ITU has carried out in the area of data quality assessment and approval of the new framework. The representative of DevSTAT suggested that UNSC, which had endorsed the Partnership on Measuring ICT for Development’s core list of indicators, recommend that all countries adopt the ITU data quality assurance framework for the core list. This could be particularly useful for NRAs since many of them did not yet follow a data quality assurance framework.
103. The next presentation was made by **Mr Kiyoshi Mori, Director General for International Affairs at the Global ICT Strategy Bureau within the Japanese Ministry of Internal Affairs and Communications**. Mr Mori suggested that a rapidly evolving ICT environment is providing access to more data, and more data sources. He highlighted the link between data quality, and open and big data, and demonstrated the need to review and adapt data quality discussions in light of new developments in the area of both, big and open, data. The emergence of new and big data sources, which include a large variety of new and old sources and data in unstructured format, in particular, creates new data quality challenges. The huge increase in the volume of big data – which is estimated to have increased 8.7 times in Japan over the last 8 years – illustrates these challenges. Mr Mori also discussed Japan’s move towards adopting open data policies, highlighted their benefits, and Japan’s efforts to establish new processes and rules in terms of publishing secondary data, and for data visualization. Two key challenges that Mr Mori identified were the protection of personal data, and the need to train a sufficient number of skilled data scientists.
104. The next presentation was made by **Ms Kaoru Kimura, ICT Policy Specialist at the World Bank**. Ms Kimura provided a definition of open data, which refers to data that must be legally, as well as technically open and which is a piece of data or content that anyone is free to use, reuse, and redistribute. Ms Kimura gave a brief overview of the World Bank’s process toward open data, which started in 2010, when only the data from the World Development Indicators were made available

freely. Today, the entire database of the World Bank is made available. To ensure the quality of the open (including big) data, users are bound to a basic legal framework to use, distribute and manipulate the data.

105. The World Bank presentation pointed to many benefits arising from its move towards open data: it has increased transparency by allowing anyone to monitor data and by making data publishers more accountable. The open data policy has also increased efficiency and innovation by making data and information available to a much larger group of users; and it has increased the level of participation and engagement by creating an ongoing dialog and relationship between data users and data producers. The World Bank has witnessed a 10-fold increase in the use of World Bank data and the open data site – data.worldbank.org – accounts for one third of the entire organization's website traffic.
106. Ms Kimura provided an overview of the available data which users can search, by indicator, by country, by topic, and via a World Bank catalogue that also points to the different formats (and sometimes languages) in which the data are available. The presentation also illustrated a number of applications that use the World Bank data to produce data charts and information in other formats. In addition to making its own data available, the World Bank has developed an open government data toolkit, which countries can use to move towards an open data policy. An open data scorecard allows the World Bank, and others, to evaluate progress. According to Ms Kimura, 20 countries, including Moldova – the country making the next presentation – had so far implemented an open data policy.
107. **Ms Livia Turcanu from the e-Government Center in Moldova** presented Moldova's experience in adopting an open data policy. According to Ms Turcanu, Moldova decided to open up its data primarily to increase transparency and accountability, a move that has improved civic involvement, fought corruption, led to better decisions, and made the government more efficient. The open data process in Moldova started in 2010/11, with the World Bank as the main donor and a very high level of political support and commitment, including a Prime Minister's directive. The data.gov.md website features close to 800 datasets and 19 open data applications that help users to extract and visualize data, and over 160'000 downloads have been made for the current year. The open data portal includes a user manual and a methodological publication providing details on the data published.
108. Ms Turcanu highlighted that besides a high level of commitment and visibility, the success of the open data project also required the adoption of the legal and institutional frameworks within the government, and in particular the identification of focal points within the different departments and Ministries of the government. The open data project allows for the consultation and exchange of information with members of civil society, for example to discuss the kind of data that is made available, and its formats. One of the key challenges highlighted by Ms Turcanu is open data quality, which refers not only to data accuracy, but also to the availability, completeness, relevance, validity and timeliness of data. To improve open data quality, and to protect sensitive data, Moldova's government applies a set of open data principles that, for example, stipulate that data are adequately described and that they follow specific standards, and are based on centralized data collection mechanisms. The government of Moldova has also set up an information management system, which coordinates the

data from the different data sources (including the different Ministries), and which allows data users to provide feedback.

109. The discussions following the presentations highlighted the audience's interest in the topic of data quality, open data, and big data, and raised a number of questions, including about the challenges in convincing government organisations to make their data open. Egypt highlighted that to ensure the quality of data, data producers have to take certain steps even before data are collected, for example, in the design of the questionnaire and its technical specifications. Iran emphasized the need for data producers to adopt a data quality assurance framework and asked the representative of Moldova to provide some examples of open data applications. Ms Turcanu highlighted an application that allows users to see how the government budget is spent, by category, and in a user-friendly info-graphic.
110. Japan inquired about the World Bank's policy for the distribution of data produced outside the World Bank, and how the Bank ensures data quality, accuracy and timeliness. The World Bank replied that for the different data sets and sources it was in direct contact with the data producers to discuss any data distribution issues. The World Bank also clarified that it only published third party data that was already made available freely by the original source. When the delegate from Saudi Arabia highlighted some difficulties that developing countries may face in implementing an open data policy, Japan replied that the benefits of open data policies applied to all developed and developing countries. Benin inquired how it could benefit from the World Bank's support and asked the representative from Moldova whether citizens can make suggestions on how to improve the open data portal. Ms Turcanu replied that citizens are invited to get involved and provide their feedback, including through the open data website (www.date.gov.md). Mr Colledge agreed that it was important to also have a national data quality assurance framework for ICT supply side statistics. The moderator thanked the speakers for their interventions and closed the session.

International Coordination of ICT Measurement – 10th Anniversary of the Partnership on Measuring ICT for Development

111. The session was moderated by **Mr David Souter, Managing Director, ict Development Associates**. The main objective of the session was to present the key achievements of the Partnership on Measuring ICT for Development in the past ten years and to discuss future topics that the international community should address to enhance ICT measurement. The panellists debated within the context of the post-WSIS discussions and the post 2015 development agenda, on remaining challenges to create an inclusive information society. A short video highlighting the different activities and achievements of the Partnership, including capacity building workshops and training and documents produced by the Partnership was played at the beginning of the session. In addition, a background document summarizing the achievements of the Partnership and future areas of work was distributed during the Symposium.
112. **Dr Susan Teltscher, Head, ICT Data and Statistics Division, ITU**, and representing the Steering Committee of the Partnership highlighted ITU's role in the Partnership, as one of its founding members.

She mentioned that the ITU cooperates closely with the Partnership in implementing its ICT measurement work. The ITU had been very active in Partnership, particularly leading the Task Group on Measuring the WSIS Targets. In addition, ITU had played a key role in pushing forward ICT measurement work at the international statistical community through the UN Statistical Commission. During the WTIS, one session on the work of the Partnership was usually featured (such as the current session), for example on topics that were not necessarily the focus of ITU's statistical work but important for ICT measurements. She mentioned some of the challenges faced by the Partnership which were related to enhancing the availability of ICT statistics, the key objective when the Partnership was formed. Although much work had been done on the establishment of the core indicators and its associated standards, data availability in most of the indicators was still limited. This was partly due to the lengthy process of introducing ICT statistics in national data collections. One of the successes to date that Ms Teltscher highlighted was the inclusion of ICT statistics in the UN Handbook of Population Censuses, which enabled many countries to include ICT indicators in the census data collection. Despite this effort, lack of ICT data still persisted. She emphasized the need to focus more on data availability, and the issues related to achieving this. She added that another challenge was related to the non-collection of data at the international level for some of the ICT indicators. She noted that unless data were collected from countries by an international agency, data were not collected at the country level. For example, the data on the core e-government indicators were not collected at the international level and therefore very little data collection was happening in countries. She also highlighted the importance of national coordination since data collection was spread across many agencies in the countries. Lastly, she raised the issue of funding which was needed, and pointed to the very limited financial resources at the international and national levels that were allocated to ICT statistics. In particular, national data collection was often limited due to lack of funding to collect the data. She highlighted that the Partnership should look into alternative data sources, such as those related to big data, to address the issue of data availability in the future.

113. **Ms Scarlett Fondeur Gil, Economic Affairs Officer, ICT Analysis Section, UNCTAD** and representing the Steering Committee of the Partnership provided some background on the creation of the Partnership, which was launched at the occasion of UNCTAD XI in Brazil in 2004. She mentioned that before its launch, some discussions had taken place between the different agencies. This started during the WSIS 2013, where targets were defined but there was a lack of ICT data in many areas. In particular, data on the usage of ICTs were not available in almost all areas currently covered by the Partnership. She noted that since 2004, a lot had happened and this was due to the hard work done by members of the Partnership. Although much has been done, she highlighted the need for continuous awareness raising and the need to remind policy makers on the importance of ICT statistics in advancing ICT for development. She highlighted that UNCTAD was still pushing countries to collect ICT use in businesses, since there was not enough data in that area. She emphasized the importance of having good data to assess the progress made, to compare with other countries, and to measure impact by linking ICT data with other types of data. She concluded by saying that there was a need to continue measuring progress and that there was much work that the Partnership needed to focus on in the future.

114. **Mr José Luis Cervera, Director, DevStat**, who was involved with the work of the Partnership from the beginning, expressed his appreciation for the work the Partnership. He mentioned that among all the projects he had been involved in, Partnership work was very successful and had made the most impact. Mr Cervera mentioned that he had been involved in many regional training events of the Partnership which he considered very important in transferring knowledge between countries. He also found the Training- of-Trainers very fruitful as those trained were now delivering trainings in different parts of the world. In addition, he mentioned that it was very important for countries to have standards and guidelines in producing ICT statistics, such as the manuals and sample questionnaires developed by the Partnership. He also found the regional trainings very useful, which enabled countries from the same region to discuss and share experiences, such as in Latin America which shared a common language and where countries had similar levels of expertise and knowledge on ICT measurements. However, in other regions this was not the case. He mentioned some areas that the Partnership could work on the future, including ensuring data quality and providing quality report templates to allow countries to document their data quality implementation. He emphasized the importance of institutionalization of data collections and the important role that UNSC had played in the recognition of the work of the Partnership. For the future, Mr Cervera highlighted that the priorities should be related to the post 2015 development agenda, particularly in reducing inequalities between countries and within countries. Reducing inequalities within countries would require collection of data by geographical regions of the country, which would mean more detail in the data collection and dissemination. Lastly, he stated that the measurement of ICT impact was crucial and that there was a need to increase the use of ICT statistics, to increase the availability of micro data and to link them with other statistics. He mentioned that the capacity of data users needed to be raised to effectively use the data that were available and would be available in the future.

115. **Mr Vladimir Minkin, Chairman, WSIS+10 Multistakeholder Preparatory Platform and ITU Council Working Group on WSIS**, highlighted the importance of the periodic evaluation of the WSIS Targets based on agreed methodology and having indicators that take into consideration the different levels of development and needs of countries. He noted that since 2004, the Partnership had improved the availability of ICT statistics and coordinated the work of UN agencies on ICT measurements. He pointed out the important publication of the Partnership on Measuring the WSIS Targets and the event that was organized by the Partnership during the WSIS High-Level Event in June 2014. He noted that despite the considerable improvements since the first WSIS in 2003, challenges still remained. In particular, he noted that new priority areas were defined in the WSIS outcome document, including on ICT measurement. Mr Minkin emphasized the importance of having targets that were time bound, indicators that could measure the WSIS outcomes, and the need for reliable data. He recognized that the results of the measurement work done by the Partnership were now used by countries, and encouraged countries to share outcomes and success stories. He noted that some targets were very difficult to measure and that more work was needed in the measurement of post 2015 and the impact of future goals. He called for the Partnership to define indicators that were clear and easy to understand, relevant for policy intervention, and based on internationally agreed standards. He mentioned that the WSIS had called for each UN agency to develop targets under their area of responsibility. He mentioned that the ITU developed its targets based on the Connect2020 initiative

which was presented to ITU members. He called for other agencies to check what the ITU had done and encouraged the Partnership to continue coordinating the ICT measurement work of the UN.

116. **Mr Gerardo Lopez, Director, Statistics on Science and Technology, Instituto Nacional de Estadística y Geografía, Mexico** shared Latin America's and Mexico's experience in compiling ICT statistics. He mentioned that in the beginning, it was difficult to compare countries in the region since each country used different methodologies when collecting ICT statistics. He highlighted that because of the efforts made by the Partnership, the region managed to compile comparable data. He highlighted the importance of compiling ICT data in different areas, using agreed international standards, similar to the case of other statistics such as demographic and economic statistics. He emphasized that the Partnership should look at the issue of resources, since many countries were experiencing financial difficulties to sustain ICT data collection. Finally, he highlighted the important work done by the Partnership in improving the availability of data in countries and the importance of international gatherings such as the WTIS in identifying challenges and achievements of countries.

117. The last panellist, **Ms Alison Gillwald, Executive Director, Research ICT Africa (RIA)**, highlighted the huge efforts done by the Partnership in increasing data availability in countries. She provided the experience of RIA related to ICT data collection, with an initial goal to help regulators in the region formulate policies using hard data. RIA started developing data collection templates that helped countries collect administrative data. On the demand side data, RIA conducted household surveys in a number of countries, starting with seven countries in 2005, then increased to 12 countries in 2012 and another three countries planned for next year. As far as Africa was concerned, she mentioned that one of the challenges faced by countries was the collection of data through official surveys. In particular, there was lack of data on informal sector activities which is common in those countries. She mentioned that apart from the availability of core indicators and its associated standards developed by the Partnership, not much had happened in the region due to limited resources. Data gaps in the region were often complemented by data produced by private companies, but these data were not available for public use. Ms Gillwald emphasized the need to ensure that the data produced were for public consumption. She mentioned that some of the institutional capacity building to ensure that data are available had been eroded by private companies producing this data. She encouraged countries to make use of their capacities in producing official representative data. Finally, she called for regulators and NSOs to work together in ensuring that data were produced and disseminated to support policy making.

118. During the discussions, the moderator asked the participants to address which areas of measurement the Partnership should focus on in the future. Brazil shared their experience on ICT measurement which was closely linked to the work of the Partnership. They started conducting the household survey in 2004 using the Partnership methodologies. In addition, the delegate mentioned that the commitment of the four key stakeholders in the country (Ministry, CETIC, ANATEL and NSO) enabled them to conduct surveys that were required by policy makers. In addition, to ensure that data were properly analysed, they provided access to the micro data to analysts to enable them to analyse impact. An example of this work was on ICT in education, which looked at assessing the impact of ICTs in teaching the curriculum. Brazil had also conducted recently a ministerial dialogue to raise awareness on the use

of ICT statistics in policy making and the necessary action plans covering many areas. He mentioned that the Partnership was well-known in the region as a very successful initiative. He concluded by congratulating all members of the Partnership and encouraging them to continue the good work in the future.

119. UNSD highlighted that the major focus in the near future was on the post 2015 development agenda and that the Partnership should focus on indicators related to this. He mentioned that most funding related to statistics would be directed to those indicators and that there would be more effort on conducting household surveys where ICT statistics could be included if ICT indicators were part of the SDG targets. He emphasised that the NSOs should play a key role as a coordination office since ICT was a cross-cutting issue. Lastly, he mentioned that linking of data was very important but it should be done at the micro data level.
120. Kenya made an intervention and requested the Partnership to focus more on country capacity building particularly on demand side statistics. She requested RIA to provide more information on the planned household survey in three African countries. Iran congratulated the Partnership on its 10th year anniversary and mentioned that they had benefitted from the work of the Partnership, particularly on the trainings delivered and manuals developed by members of the Partnership. He highlighted the importance of continuing the initiatives of the Partnership which bring benefits to many developing countries. He added that the Connect2020 initiative of the ITU highlighted the important role of ICTs in achieving different development agenda, and the importance of indicators in monitoring the goals and targets. He emphasized that the main priority of the Partnership should be related to monitoring these goals and targets. He highlighted that policy makers and the measurement community should establish the link in defining indicators to help national development goals. He requested the Partnership to explore indicators that will measure content on the Internet.
121. Cameroon congratulated the Partnership and the ITU for having indicators that help them advance the measurement work in the country. She mentioned that conducting surveys to measure how the population use ICTs should be the priority of countries. GSMA congratulated the Partnership and noted that there are similarities with the work they do and the Partnership. He emphasized the importance of collecting demand side data and to understand the usage pattern of individuals. He also pointed to the importance of analysing the data to better understand the impact of ICT. Mr Richard Heeks mentioned the life cycle of data which is production, analysis and use. He pointed to the importance of increasing the use of data and increasing the capacity to use the data for decision making. He noted that there were lots of data produced but there was lack of capacity on how data could be put into effective use for good results.
122. When the moderator invited each panellist to make a final statement, Mr Jose Cervera (DEVSTAT) emphasized that the Partnership should work more with data users since the Partnership is very well positioned in raising capacity of data users. Ms Alison Gillwald (RIA) emphasized the importance of conducting demand side surveys, and having funding to conduct the survey, to get time series information on how countries evolved and find out the impact of ICTs. Ms Scarlett Fondeur Gil (UNCTAD) highlighted that although there were data on other areas such as on ICT infrastructure, there

was very limited data on information economy, particularly on the core indicators. Ms Susan Teltscher (ITU) mentioned that the Partnership recognized the importance of taking into consideration data user needs. She added that some Partnership Task Groups included non-members who also represented users of ICT data. She mentioned that the high level session of the WTIS included different stakeholders and was also a way of raising awareness among data users.

123. The moderator concluded by stressing the importance of having comprehensive ICT data and the need to ensure the quality of data collected and disseminated. He pointed to the diversity of data sources and the need to encourage coordination with different national stakeholders. He further emphasized that data production, analysis and use are areas that the Partnership should focus on in the future.

124. The moderator thanked the panellists and handed back to the WTIS Chair who highlighted the important inputs made during the panel discussion. The Chair closed the panel after thanking the panellists and the audience for their comments and questions.

Measuring the Information Society Report 2014

125. The session was moderated by **Mr Alexandre Barbosa, Head of the Center of Studies for Information and Communication Technologies in Brazil**. Mr Barbosa opened the session welcoming the new edition of the *Measuring the Information Society Report*, and highlighted that the richness of the report lay in the analyses that it contained and how they helped countries in setting their ICT development goals.

126. Before the detailed presentation of the *Measuring the Information Society Report 2014*, **Mr Pali Lehohla, Statistician General of South Africa**, delivered a keynote speech. In his address, Mr Lehohla analysed the role that statistics and communication technologies played in several milestones of history, and their interaction with power. Mr Lehohla stated that the MIS Report provided detailed information on how the information society was developing country by country and region by region, and thus the *Measuring the Information Society Report* highlighted the most advanced information societies, such as Denmark and the Republic of Korea, as well as uneven ICT development across the world. Mr Lehohla gave his view on how the findings in the *Measuring the Information Society Report* related to the principles of the Post 2015 Agenda of leaving no one behind and putting sustainable development at the center of growth. He highlighted that the data revolution, as covered in Chapter 5 of the MIS Report, was in a position to take the center of the stage in future information societies.

127. **Dr Susan Teltscher, Head of the ICT Data and Statistics Division of ITU/BDT**, presented the overview of the MIS Report 2014, and summarized the key findings of Chapter 1 of the publication highlighting the recent information society developments. Ms Teltscher presented global and regional statistics showing that mobile broadband was driving ICT growth in 2014, Internet access and use were growing steadily, but mobile-cellular and fixed-broadband uptake were slowing down. Ms Teltscher remarked that despite ICT developments digital divides persisted, and pointed to the need to address the rural-urban divide: lower 3G coverage, smaller proportion of households with Internet access and fewer enterprises and schools connected in rural areas. Ms Teltscher finalized her intervention by presenting the ITU strategic

goals and targets defined in the Connect 2020 Agenda and adopted by the recent ITU Plenipotentiary Conference (PP-14), and highlighting that they would require a measurement effort to track the progress achieved in the ICT indicators attached to each target. She informed participants that reporting on progress made towards the achievement of the new goals and targets would be presented in future editions of the *Measuring the Information Society Report*.

128. The main findings of Chapters 2 and 3 of the *Measuring the Information Society Report* were presented by **Ms Esperanza Magpantay, Senior Statistician at the ICT Data and Statistics Division of ITU/BDT**. Ms Magpantay provided an overview of the top ten performers in the IDI, all of them from Europe except Korea (Rep.) and Hong Kong (China), as well as the dynamic countries in terms of IDI progress, most of them from the developing world. Although almost all countries improved in the IDI, Ms Magpantay warned that there was a group of least connected countries which were home to 2.5 billion people and that were lagging behind. Ms Magpantay presented the results of the correlation analysis between the IDI and several geographical and demographic factors. The results showed that the IDI was significantly correlated with GNI p.c. and the percentage of urban population, but not with other factors, such as size of the country or population. Ms Magpantay closed her intervention by presenting the results of a study on the links between the IDI and the Millennium Development Goals (MDGs), showing that there was a significant correlation between IDI and many MDG indicators, such as those related to poverty reduction and improved maternal health. Ms Magpantay highlighted that this was a preliminary study and that further analysis was needed to study the links between ICT development and the MDGs.

129. **Mr Ivan Vallejo, Analyst at the ICT Data and Statistics Division of ITU/BDT**, presented the analyses of ICT prices and competition included in Chapter 4 of the MIS Report 2014. Mr Vallejo showed that fixed-broadband prices continued to decrease, albeit at a slower pace, whereas entry-level speeds increased. However, a basic fixed-broadband plan represented more than 5 per cent of GNI p.c. in most developing countries by the end of 2013, indicating that the service was still rather unaffordable. The analysis of mobile-broadband prices showed that mobile broadband in developed countries was six times more affordable than in developing countries. However, entry-level mobile broadband was cheaper than fixed broadband in many countries and the only *de facto* alternative for broadband access in some developing countries. Mr Vallejo also presented the results of a study on the affordability of broadband services in view of income inequalities, which found that household income inequalities greatly influenced the affordability of fixed- and mobile-broadband services. Mr Vallejo closed his intervention by summarizing the results of an econometric model developed to assess the quantitative impact of competition and regulation on ICT prices. According to the model, competition and regulation could help reduce fixed-broadband prices by 10% in developing countries.

130. The highlights of Chapter 5 of the *Measuring the Information Society Report 2014 – “The role of big data for ICT monitoring and for development”* – was presented by **Ms Vanessa Gray, Senior Analyst at the ICT Data and Statistics Division of ITU/BDT**. Ms Gray explained how the rapid transformation of the ICT sector and a growing digitization were behind the big data phenomenon, and discussed how big data could complement official statistics. She highlighted the potential of big data from the ICT industry for social and economic development, and provided some examples of the kind of information that could be obtained from the registers of mobile operators. Ms Gray showed two case studies on the usage of big

data: mobile phone data for poverty mapping in Côte d'Ivoire and for emergency response operations in Haiti. Ms Gray closed her presentation by enumerating the main challenges that remained for unlocking the potential of big data: privacy, security, standardization, continuity and data curation.

131. The moderator opened the floor for questions and comments and Saudi Arabia intervened to highlight that GNI and GDP per capita were macroeconomic measurements that did not consider the informal economy, which in some developing countries was a large part of the total. The delegate from Saudi Arabia proposed to consider other measurements of economic wealth when analysing the affordability of ICT services. Mr Vallejo acknowledged the limitations of GNI and GDP per capita, and explained that in the *Measuring the Information Society Report* alternative measurements that better reflected the economic means of the people had been considered, such as household disposable income and household consumption expenditure. Unfortunately, data availability for these indicators was limited, particularly in developing countries, and therefore they could only be used for analysis of selected countries and not for a global affordability benchmark. Lao P.D.R. asked for guidance on how small countries could progress on the IDI. Ms Teltscher answered that the results of the correlation analysis carried out on the IDI showed that the size of the country was not directly linked with the IDI value. Regarding the specific measures that could be undertaken to promote ICT development, Ms Teltscher mentioned that the definition and efficient implementation of national ICT strategies could contribute to ICT development, and that data showed that some countries that had succeeded in doing so had achieved higher IDI levels than other countries with higher GDP per capita levels.

132. RIA took the floor to ask Mr Lehola about the underlying factors of the success of the top IDI countries, particularly regarding the institutional bases of these countries and their high human development. RIA questioned the comparison between fixed- and mobile-broadband prices because of the different characteristics of both services, particularly regarding quality of service, and highlighted that fixed-broadband penetration was so limited in Africa that comparisons with mobile broadband might be misleading. Mr Lehola answered by highlighting a fundamentally new characteristic of the current situation: the reusability of data and the fact that it is not a scarce resource, which should be a driver of change in the established economic and political systems. Mr Lehola further noted that several of the top IDI countries were Scandinavian, and remarked the long track of human solidarity that existed in these countries. He also commented that the Republic of Korea had advanced enormously in the last 50 years to reach the current high levels of ICT development, and that solidarity had been a key value to achieve such development. Mr Lehola suggested that the *Measuring the Information Society Report* should be read together with the Human Development Index and other reports on the economic and political situation. Mr Vallejo acknowledged the differences in the quality of service of mobile- and fixed-broadband services, and noted that these were reflected in the analysis of each service. He, however, stated that the comparison between the entry-level prices of both services was still relevant, particularly to highlight those cases where both services were offered and differences in the affordability could make only one of them *de facto* available for the majority of the population.

133. Iran took the floor to ask whether there were any plans to develop and encourage the collection of indicators to measure impact, and proposed to revise the ICT skills indicators to improve them. Iran also proposed to extend the analysis of prices and regulation to explore the link between these variables and

investment, and inquired whether the analysis of the digital natives included in the MIS Report 2013 would be continued in the future. Moldova suggested that the analysis of prices should include the rankings of countries based on the end user price. Indonesia asked how changes in the methodology of the IDI affected the ranking of countries, and inquired whether the relationship between IDI and specific geographical situations had been analysed, such as in the case of landlocked countries or archipelagos. Japan took the floor to highlight the need to incorporate new trends in ICT markets in the MIS Report and asked ITU to clarify how that would be done.

134. Ms Teltscher addressed the questions from the floor. She commented that the Partnership on Measuring ICT for Development had been looking into the measurement of impact and that the IDI was not constructed to include this dimension, but that the discussions on impact indicators were ongoing in the context of the Partnership. Ms Teltscher explained that the discussion of the indicators to measure ICT skills was taking place in the EGTI and that UIS was contributing to the discussion with a view to improving the measurement of ICT skills. Ms Teltscher took note of the proposal to look into the impact of regulation and prices on investment as a topic for future analysis and commented that the statistical work on the digital natives was a one-off exercise carried out in 2013, but that it could be retaken in the future if there was interest in it. Ms Teltscher explained that prices in the MIS Report were presented also in terms of USD and PPP\$, and that rankings were based on prices as a percentage of GNI p.c. because that was the metric that better reflected affordability. Additional tables on the rankings according to the other price categories could be added in future editions of the report. Ms Teltscher noted that the methodology of the IDI had not changed much in the previous years, and that all changes were discussed and agreed in EGTI. She took note of the proposal to analyse the performance of landlocked countries in the IDI, and explained that ITU was already trying to incorporate emerging ICT trends in the MIS Report, such as in the chapter on big data and some sections on new technologies. Ms Teltscher closed her intervention by welcoming any suggestions from Member States on the topics of interest for future editions of the *Measuring the Information Society Report*.

135. The moderator made some closing remarks on how the *Measuring the Information Society Report 2014* provided analyses of past ICT trends which could be used to understand the future, particularly in view of the opportunities of big data and the objectives set by the ITU Connect 2020 Agenda. The moderator handed the floor to the Delegated Chair of WTIS, who closed the panel after thanking the panellists and the audience.

Panel discussion on the ITU ICT Development Index (IDI)

136. The high-level panel debate on the ICT Development Index (IDI) was opened by the **WTIS Chair, H.E. Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development, Georgia**, who introduced the moderator, **Dr Cosmas Zavazava, Chief of the Project Support and Knowledge Management Department within the ITU Telecommunication Development Bureau**. Dr Zavazava briefly introduced the IDI as one of the most used international benchmarks for evaluating and comparing countries' progress in terms of ICT developments. He referred to the main objective of the panel, which was to share and discuss countries' experiences in using policies to influence ICT developments. He then invited the representative of Denmark, **Mr Esben Emborg, Head of the Mission**

of the Danish Consulate in Georgia, to talk about some of the success factors that had allowed Denmark to move to the very top of the IDI ranking.

137. Mr Emborg described Denmark as a country that had actively strived to become an ICT innovator. The country's relatively large public sector used information and communication technologies extensively and had ensured that every person in Denmark had affordable access to ICTs. In addition, the government had standardized its information systems and put in place advanced e-government services and policies that had a spill-over effect on other sectors, and in particular on the private sector. Mr Emborg highlighted that Denmark was a relatively small country with a high level of income. He also emphasized the importance of a large political consensus, and a high degree of skills that had become key drivers of the country's information economy.
138. **Dr Seung Keon Kim, Director General of the Korean Association for ICT Promotion in the Republic of Korea**, shared some of Korea's drivers of success, which included a very large ICT manufacturing and electronics. He explained that when Korea went through an important modernization process in the 1970s and 1980s, it had invested heavily in the ICT industry as a key driver of economic and social growth. Dr Kim explained that today the ICT sector remained the Republic of Korea's most important industry, which produces a relatively large part of the country's GDP. He further made it clear that the country, which does not have any large amounts of natural resources, heavily relied on its human capital and invested in people's (ICT) skills. In addition, he highlighted that Korea had made ICT measurement a priority, and that it collected very detailed information to monitor ICT uptake and use, including through administrative and survey data from households and businesses. Korea had set a number of clear targets to build a nationwide high speed network and to launch advanced technologies, including 5G networks, which were currently being tested. Dr Kim expressed his country's strong support for the work of ITU, and promised its collaboration in achieving the ITU Connect2020 vision and goals, including by sharing Korea's experience with other member states.
139. **Dr Nagwa Ebrahim Elshenawy, Undersecretary for Information and Strategic Planning, Ministry of Communications and Information Technology in Egypt**, also highlighted the importance that her country had attached to the development of a strong and growing ICT industry, including the ICT export industry. Ms Elshenawy pointed to some specific policies that were helping to drive Egypt's digital economy, such as the introduction of unified licensing to improve the level of competition, the adoption of new technologies, and the promotion of innovation for development. She emphasized the importance of fostering inclusive development across all socio-economic groups, of connecting more households with ICTs, and of bringing ICTs to the educational sector. To identify challenges, Egypt had paid close attention to monitoring ICT progress, in particular to track the digital divide.
140. **H.E. Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development in Georgia**, emphasized that Georgia had been able to make progress in terms of ICT developments – as highlighted by the IDI – by making a number of reforms to foster ICT infrastructure, including by connecting community innovation centers within the country to a high-speed fibre optic network, and by facilitating the development of the private sector. Market liberalization and competition, including through open access policies, were playing an important role in improving the delivery of ICT services

and at the same time, the government was actively driving the country's level of innovation and the use of new technologies. According to Mr Kumsishvili, the government had become an active user of ICTs, including through the digitization of all e-government services. In addition, Georgia was investing in its educational system by equipping schools with access to ICTs, and through the development of skills, which Mr Kumsishvili described as key drivers of the information economy.

141. **H. E. Dr Azzam Sleit, Jordan's Minister of Information and Communication Technology** pointed to the importance of human capital, which he described as his country's main asset. To drive ICT developments, Jordan had been implementing smart regulation, built an extensive infrastructure network and promoted the investment in new technologies, including 4G. He explained that the ICT sector contributed a relatively large share, of between 12-14 per cent, to the country's overall gross national income. Mr Sleit further stressed the importance of evidence based policy making and described his government's monitoring efforts, which include comparing Jordan's ICT developments to those in other countries, so as to identify strengths, and weaknesses.

142. Following the interventions of the panelists, the moderator opened the floor for questions and answers. Bangladesh evoked the possibility of a global ICT fund to help overcome the digital divide and drive progress in the world's least connected countries. Both Mr Emborg and Dr Kim agreed that ICTs were of great importance for any development strategy and Dr Kim mentioned that Korea had several government programs, and an ICT Trust Fund, to support ICTs in developing countries. Namibia inquired about the role of the private sector in driving a country's ICT strategy. In response, Mr Emborg suggested that while the private sector was instrumental, the public sector had an important responsibility in driving progress, including by creating the right regulatory framework and by creating demand for ICTs, for example, through the delivery of e-government services. Both, Dr Sleit and Dr Elshenawy, underlined the important role of the private sector but highlighted the role of the public sector as a facilitator of progress and investment.

143. A number of countries highlighted the importance of the ICT Development Index (IDI) for assessing countries' progress and shortcomings. Tunisia pointed out that its drop in the IDI value was primarily due to the recent revolution but that the country was taking active steps, including the promotion of e-business services and fostering of foreign investment, to drive ICT uptake and use. Tunisia has set a number of targets in its national ICT Strategic Plan, and carried out a household, a business and an e-government survey, with results expected in 2015.

144. Saudi Arabia questioned the fact that the ITU Measuring the Information Society Report had not found a significant correlation between a country's size and the IDI value. While Saudi Arabia, through its universal fund, had connected its rural and remote areas, this had required large investments. Mozambique also pointed to the difficulties in connecting its rural and remote areas and Dr Elshenawy explained that it was a challenge to bring its very large population online, and to provide ICT services across its large land area. She also highlighted the importance of measuring the impact of ICTs on economic development and suggested that an economic variable could be taken into account for the calculation of the IDI. Dr Sleit recommended that governments could use a universal service fund to connect remote and rural areas. By not charging for the allocation of spectrum, they could also provide

incentives for operators to provide services in less economically viable areas. Mr Emborg suggested that the ICT service sector, especially in developing countries and rural areas, remained a very interesting and profitable market.

145. The moderator closed the panel debate by pointing to the important role of the IDI in helping countries to benchmark developments, and to assess progress and weaknesses. He thanked the panelists and the audience for their comments and for sharing their valuable insights and experiences.

Conclusions and recommendations

146. During the concluding session, the delegated Chair of WTIS, **Mr Irakli Kashbadze, Chairman of the Innovation and Technology Agency, Georgia**, presented the draft conclusions and recommendations of the Symposium. He invited delegates to submit any comments and suggestions by 12 December 2014, by when the document would be finalized. The Annex to this report presents the final version of the conclusions and recommendations as agreed by the meeting.

Award ceremony and closing

147. At the end of the Symposium, an “Information society measurement award” and a trophy for those countries that hosted WTIM/S in the past were handed out to: Egypt (WTIM 2009), Mauritius (WTIM 2011), Thailand (WTIM 2012), Mexico (WTIS 2013) and Georgia (WTIS 2014).

148. When turning to the venue of WTIS 2015, **Mr Kiyoshi Mori, Director-General for International Affairs, Global ICT Strategy Bureau, Ministry of Internal Affairs and Communication of Japan**, made a formal announcement offering to host WTIS 2015 in Japan during the week of 30 November 2015, for three days. He mentioned that the exact location (city) will be determined before the end of 2014.

149. During the final closing ceremony, closing statements were delivered by H.E. **Mr Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development, Georgia**; **Mr Brahim Sanou, Director of the ITU Telecommunication Development Bureau**; **Mr Vakhtang Abashidze, Chairperson of the Commission, Georgian Communications Commission**; and **Mr Tengiz Tsekvava, Deputy Executive Director, National Statistics Office, Georgia**.

12TH WORLD TELECOMMUNICATION/ICT INDICATORS SYMPOSIUM (WTIS)

24-26 November 2014

Tbilisi, Georgia

Conclusions and recommendations

Presented by the Chair

150. The 12th World Telecommunication/ICT Indicators Symposium (WTIS) was opened by the Prime Minister of Georgia, Ministers and ITU elected officials, followed by a Ministerial Roundtable on the post 2015 development agenda and future priorities for ICT for development (ICT4D) policy. Other topics featured during the Symposium included big data for development and the future of ICT measurement; measuring competition, regulation and affordability of ICT services; current and future work on telecommunication/ICT indicators and on ICT household indicators, including reports by the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH); and data quality, big data and open data.
151. A special session on international coordination of ICT measurement was held at the occasion of the 10th Anniversary of the Partnership on Measuring ICT for Development.
152. For the first time, the ITU Measuring the Information Society Report was launched at WTIS during a special launch ceremony. A session dedicated to the discussion of the results of the report took place, followed by a panel debate on the ICT Development Index (IDI).
153. Based on the WTIS presentations and discussions, the following conclusions and recommendations are made.

The post 2015 development agenda and future priorities for ICT for development (ICT4D)

154. The Ministerial Roundtable highlighted that the post 2015 development agenda will be the most important force shaping the future for development, as well as the future information and communication technologies for development (ICT4D) priorities. It highlighted a mismatch between new development priorities and the current ICT4D debate, which requires re-thinking and should be adapted to the new trends of the post 2015 development agenda, with a focus on sustainable and inclusive development.
155. Panelists recognized that future development projects need to recognize ICTs not simply as a tool amongst others, but rather as a platform that inherently transforms development into digital development. To this end, citizens need to be digitally empowered, become the owners of ICTs, and be equipped with the necessary digital skills.

156. The panel discussion emphasized that ICT development levels continue to vary greatly between and within countries and that policies, particularly in developing countries, must deliver sustained and equitable ICT infrastructure (in particular broadband) and access, to ensure that eventually all citizens, including in rural and remote areas, can benefit from ICTs as a platform.
157. The WTIS demonstrated that the post 2015 development agenda acknowledges the importance of measurement for policy making, including through its call for a data revolution. A future monitoring framework should take advantage of big data, and equip data users with the necessary skills to analyze big data. Impact measurement is important to gather empirical evidence on progress made through ICTs. ICT measurement priorities also need to adapt to monitor future ICT4D priorities and need to continue to track digital inclusion.

Big Data for development and the future of ICT measurement

158. The session illustrated that big data offer significant possibilities for producing new ICT indicators and for providing new data that can be relevant for international and national development policies, social and economic planning, and emergency and disaster relief programmes.
159. The ICT sector is a major source of big data. This includes, among others, data from telecommunication operators, such as mobile phone data; data from social network service providers; and ICT equipment providers, such as network and mobile device manufacturers. Data available on the web offer important insights into geographic and other inequalities related to ICT and the global digital divides. The Telefonica example of Ebola has illustrated vividly how mobile phone data can be used by policy makers in the case of disease tracking and the coordination of relief efforts.
160. The international and national statistical community should take an active role in exploring the use of big data for official statistics. The session highlighted a number of good examples of how National Statistical Offices (NSOs) have embraced big data for their statistical work. The United Nations Global Working Group on Big Data plays an important role in this regard, by providing strategic guidance as well as concrete and practical examples of big data sources. ITU should participate in these activities and explore the potential of using big data for measuring the information society. Consideration should be given to engaging in partnerships with private sector companies and other stakeholder to join forces in the production of new, high-quality, policy-relevant data.
161. Participants highlighted a number of issues that need to be taken into consideration when starting to use big data. These include data privacy and confidentiality, human and financial resources, as well as methodological considerations which can impact on the quality of the data. Furthermore, the representativeness of big data needs to be carefully assessed before data are disseminated for use by policy makers and other stakeholders.

Measuring competition, regulation and affordability of ICT services

162. The panellists presented evidence from academic research as well as country experiences confirming that affordability of ICT prices remained a determining factor for ICT uptake, particularly among low-income sectors of the population, and that competition and regulation played a key role in shaping prices and therefore they could be enablers of ICT uptake.
163. The panellists highlighted that market analyses, which are at the core of regulation, required detailed data to explore the effects of regulatory remedies on competition and, ultimately, on prices. Data are also vital for evidence-based decisions on spectrum management, digital inclusion programmes and other policy initiatives that have an impact on prices.
164. The Symposium recognized data gaps that prevented better quantitative assessments of the impact of regulatory and policy initiatives, as well as the need for more analytical studies on the data already available to inform policy-makers, particularly in developing countries.
165. The Symposium highlighted the importance of producing statistics to evaluate the impact of regulatory measures. Data should cover the whole ecosystem, including supply-side data, such as detailed data on ICT prices, and demand-side data, such as granular data obtained from ICT household surveys.

Current and future work on Telecommunication/ICT Indicators

166. The Symposium welcomed the growing participation of experts in ICT statistics in the work carried out by the Expert Group on Telecommunication/ICT Indicators (EGTI). Delegates also welcomed the collaboration between EGTI and the Expert Group on ICT Household Indicators (EGH) to discuss the issues that are relevant to both groups.
167. The Symposium acknowledged the work carried out by EGTI in 2014 under the chairmanship of Iñigo Herguera, from Spain, and endorsed the outcomes of the 5th EGTI meeting held on 17-18 September 2014 in Geneva. The Symposium agreed to start collecting from 2015 data on M2M subscriptions, coverage of LTE and other advanced mobile-broadband networks and separate fixed-broadband subscription data for organizations. The Symposium also agreed to replace the indicator on international Internet bandwidth with two indicators more precisely defined: "Lit/equipped international Internet bandwidth" and "Used international Internet bandwidth (traffic)". In view of the growing importance of bundled telecommunication services and the data already collected by some countries, the Symposium accepted the indicators on bundled telecommunication services proposed by EGTI and encouraged countries to collect these data. The Symposium further agreed that ITU should discontinue the data collection of the indicators identified by EGTI as no longer relevant at the international level.
168. Taking into consideration the development opportunity that m-banking services represent, the Symposium acknowledged the importance of monitoring these services. The Symposium also highlighted that anonymised raw location data, as well as other operator micro data, could be used to produce societal statistics.

169. In view of the items for future discussion proposed by EGTI, WTIS agreed that EGTI should work on the following topics in the next working period: revision of the 2011 ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT; additional sources for administrative data (big data, OTT); indicators on fixed-broadband services in public and private organizations (carry over); sub-categories of mobile broadband subscriptions (carry over); subscription data on advanced mobile-broadband technologies (carry over); and indicators on m-banking services. The Symposium welcomed the proposal from the UNESCO Institute for Statistics (UIS) to improve the IDI skills sub-index and agreed that EGTI should further examine it.

Current and future work on ICT Household Indicators

170. The meeting acknowledges the important work carried out by the ITU Expert Group on ICT Household Indicators (EGH), under the chairmanship of Alexandre Barbosa from Brazil, in reviewing existing, and defining new indicators to reflect changes in the access to and use of ICTs by individuals and households, and endorsed the outcomes of the 5th EGH meeting held on 15-16 September 2014 in Geneva, including a number of new indicators that will be included in the ICT household indicators questionnaire.

171. Participants highlighted that demand side data can help policy makers understand the bottlenecks for ICT uptake and use. One suggestion made during the discussions was to include a repository of model questionnaires on the various questions and topics on the EGH forum.

172. Existing indicators on mobile phone networks and subscriptions do not provide sufficient information on mobile phone ownership, actual use, uptake and the spread of mobile services. The WTIS welcomed the initiatives of ITU and GSMA Intelligence to cooperate, among others, in harmonizing indicators related to unique subscriptions, mobile users and mobile owners, and in improving current estimates for countries that do not collect ICT household indicators.

173. Measuring barriers to ICT use is a critical since it is necessary for policy makers to measure digital inclusion, to distinguish between access and use barriers, to adopt policies and to help more people to join the information society. Countries are encouraged to share experiences on collecting data on barriers to ICT use, which is one of the new topics on the EGH forum.

174. The session and subsequent discussion highlighted the need to produce data on Internet security, which is necessary to safeguard the well-being of Internet users, businesses, and other public and private entities. Countries are encouraged to review existing surveys to include the indicators and definitions on Internet security discussed in the EGH, and to consult the Eurostat model survey, which will be available in March 2015.

Data quality, big data, open data

175. The session welcomed ITU's efforts to develop a quality assurance framework for ICT statistics and recommended that the framework also be presented to the UN Statistical Commission. The growing recognition of the importance of ICT statistics for social and economic development, and the discussions on big data, are imposing new challenges for ICT data quality and make it necessary to establish clear quality guidelines. While most national statistical organisations (NSOs) have adopted some kind of quality frameworks, most national regulatory authorities (NRAs) have not. Another suggestion of the meeting was to request the UNSC to recommend that all countries adopt the ITU ICT data quality assurance framework for the Partnership's core list of ICT indicators.
176. The emergence of open data policies and efforts to use big data to complement official statistics poses new questions of data quality and it is important to identify and develop new and adopt existing standards to maintain the quality of official ICT statistics.
177. The WTIS highlighted the long-term benefits of open data, which include transparency, accountability, efficiency, innovation, civic participation and engagement. For countries to successfully adopt and implement open data policies, it is important to have a high-level policy commitment, and to institutionalize open data processes.
178. Besides recognizing the close relationship between data quality, open data and big data, the discussions highlighted the compatibility of open data and big data, but stressed the importance of continuing work in the area of data confidentiality, and of finding a balance between protection and utilization of personal data. Another challenge that most countries are likely to face is the lack of data scientists to work with big and open data sources.

International Coordination of ICT Measurement – 10th Anniversary of the Partnership on Measuring ICT for Development

179. The Symposium applauded the excellent work carried out by the Partnership on Measuring ICT for Development during the last ten years in improving the availability of internationally comparable ICT statistics. In particular, the meeting acknowledged the achievements made by the Partnership in defining core ICT indicators, in providing capacity building through trainings and workshops, and in producing internationally agreed standards and methodologies. The meeting also recognized the work done by the Partnership in monitoring progress towards the achievements of the World Summit on the Information Society (WSIS) outcomes, goals and targets.
180. However, challenges remain in many developing countries in producing timely, quality and comparable demand side data. The meeting highlighted that funding is needed to support the conduct of surveys in developing countries, and emphasized the importance of working with donor agencies and other partners. The Partnership could also explore the use of existing capacities in countries with experience in carrying out ICT surveys, to assist the implementation of surveys in developing countries. The meeting further emphasized the importance of national coordination between the different stakeholders,

including data users, to ensure that priority areas of measurement are identified, and resources are efficiently used in the production of ICT statistics.

181. Participants identified new areas that the Partnership should work on in the future. These include analysing the impact of ICT by linking micro data collected from surveys that include ICT questions with other surveys conducted by the NSOs, in raising awareness of using available ICT data to formulate targeted policies, and in defining indicators to monitor international goals and targets, in particular those related to the post 2015 development agenda.

182. The meeting encouraged the Partnership to continue working together in helping developing countries improve the data availability of ICT statistics.

Measuring the Information Society Report 2014

183. Participants welcomed the presentation of the Measuring the Information Society Report 2014 and the insights it provided on recent information society developments, countries' ICT development status (as measured by the ICT Development Index), ICT prices and the role of competition, and the role of big data for ICT monitoring and for development.

184. The Symposium recognized that the Report provides relevant methodologies and examples for the analysis of ICT data, and highlighted that they were useful for showing how available ICT data could be used to produce relevant information to inform policies and regulation. The Symposium took note of the analysis presented in the Report on the relationship between ICT Development and selected Millennium Development Goals, such as in the area of poverty reduction, and the need for further analysis to study this relationship.

185. A number of suggestions were provided on future aspects and analysis that could be considered in the report, including on the presentation of price data, ranking countries based on the progress made, digital natives, the effect of investment on competition, regulation and prices, improving the ICT skills component of the IDI, and new technology trends.

Panel discussion on the ITU ICT Development Index (IDI)

186. WTIS recognized that the IDI remains the key international benchmark for countries to assess their ICT developments and to evaluate progress, highlight shortcomings and help countries in setting policies and goals. Sound, relevant and up-to-date statistics are crucial to track and evaluate the information society and for evidence-based policy making.

187. To drive ICT uptake and use and to help countries to fully benefit from the potential of ICTs, the panel debate highlighted some concrete medium- and long-term policies that countries can adopt and advocate. These include creating a highly competitive ICT market, developing a strong ICT sector and

developing ICT skills and investing in human capital. The discussion also emphasized the importance of the private sector in driving a vibrant information society, which depends on the roll-out of infrastructure, including high-speed broadband networks, and the delivery of innovative services.

188. The panel highlighted the importance of ICT developments for social and economic development and that the investment in, and specific policies aimed at, driving ICT uptake and use have important positive spill-over effects on countries' economy, on job creation, and to drive social development. It further emphasized that the public sector has an important role to play as a driver of innovation and to adopt new technologies and services, including through the adoption of e-government services.

189. One of the key challenges that countries continue to face is to ensure equal and inclusive access to ICTs, to and to bring high-speed and high-quality services to all parts of the population. Access in rural and remote areas continues to lack behind and more efforts must be made to bring the benefits of ICTs to these areas and population groups.