16th World Telecommunication/ICT Indicators Symposium

"Impact of Telecommunications/ICTs and Emerging Technologies on Social and Economic Development"

10 to 12 December 2018
Geneva, Switzerland

FINAL REPORT

Introduction

The 16th World Telecommunication/ICT Indicators Symposium (WTIS-18) took place in Geneva, Switzerland, from 10 to 12 December 2018. It was organized by the International Telecommunication Union (ITU).

The Symposium attracted more than 320 participants from 85 countries, representing public and private organizations including ministries, regulators, national statistical agencies, universities and research institutions, telecommunication operators, ICT firms, and regional and international organizations.

The work of WTIS-18 was conducted under the chairmanship of Mr. Mohammed Al-Ramsi, Executive Director, Regulatory Affairs, of the Telecommunications Regulatory Authority of the United Arab Emirates.

The outcomes of the Symposium will provide strategic guidance to the national and international community, including ITU, in the field of ICT statistics, and strengthen the collaboration among the global ICT statistics community.

Further information, including the agenda, the presentations delivered, media information, videos and photos are available at: https://www.itu.int/en/ITU-D/Statistics/Pages/events/wtis2018/default.aspx.

Monday 10 December 2018

Opening ceremony

Mr. Brahima Sanou, Director of ITU's Telecommunication Development Bureau (BDT), opened the meeting and welcomed all participants. He observed that the ITU community prepares high-quality statistics and indicators, and that the statistics gathered by ITU are used by many regional and international organizations, including the World Bank and World Economic Forum (WEF). ITU's statistics form the basis of the analysis of the digital economy, which is an important responsibility. High-quality data must be based on internationally agreed methodology, so everyone can speak the same language.

For an index and benchmarking tool, a solid and transparent methodology is necessary in order to measure progress. The ITU ICT Development Index (IDI) now includes six new indicators. Unfortunately, countries faced challenges in producing data for the new set of indicators and were able to provide data for only about 42 per cent of all indicators. For this reason, the launch of the revised IDI had to be postponed to 2019. The Director highlighted that the Plenipotentiary Conference 2018 had given a stronger mandate to ITU in the area of statistics. He expressed his gratitude to the two ITU expert groups working on ICT statistics, and thanked Mr. Mohamed Al Ramsi for chairing WTIS-2018.

Mr. Mohamed Al Ramsi, Executive Director of Regulatory Affairs, TRA of UAE & Chair of WTIS-18, observed that the world is changing at an incredible rate, entering a new era of data and information. Big data is a major issue with great impact on socio-economic development. ICT indicators are changing and putting countries into a framework of positive competition. Information networks are growing in their significance, and are the foundation for much innovation and exchange of expertise. In 2015, the international community adopted the Sustainable Development Goals (SDGs), and the ICT sector is an essential factor for achieving the SDGs. The Chair highlighted that WTIS has an important responsibility in implementing guidelines, examining policies and thinking about how to improve them. Working in the ICT sector, policy-makers and regulators have a great influence over the ambitions of humanity.

Session 1: The economic & social impact of ICTS

Mr. Cosmas Zavazava of ITU moderated this Session.

Mr. Raul Katz of Columbia University & Keynote Speaker, emphasized the importance of policy in shaping socio-economic development, with a critical role for data analysis for analyzing impact. Policy decisions should be informed by analysis. Policy diffusion is not random – institutions recommend certain policies, countries may imitate neighbors in geographical proximity. However, no two countries share the same conditions, so imitating policies on the basis of proximity is misguided and analyzing impact is complex. There is a need to (1) analyze the impact of policies on public services over time; and (2) compare countries with broadband connectivity with those without. Prof. Katz described some of the benefits and disadvantages of indices in tracking progress. He concluded that governments should recognize the need for empirical evidence. Policy-makers have to equip themselves with a good understanding of advantages and disadvantages of policy analysis and build the technical capability to conduct independent assessment of the quality of study results. And finally, governments should generate as much evidence as possible to improve our understanding.

Mr. Serge Abiteboul of France's regulator Arcep described how regulators use data to measure performance of new services, provide recommendations and enable consumer choice. The responsibility of regulators is to gather data and provide them to users, so consumers can be informed and exercise their choice.

Ms. Suella Hansen, economist, described her study to assess the economic impact of broadband on GDP per capita in low-income countries and LDCs. A 10 per cent increase in mobile broadband penetration results in a 2.5-2.8 per cent increase in GDP. A 10 per cent increase in fixed broadband results in 2.3-2.8 per cent growth of GDP. However, the countries with data available are the same countries looking to use broadband for growth, creating a biased sample. In future, the aim is to expand the sample, remove bias and improve the reliability of the results.

Mr. David Harmon, VP of Global Public Affairs at Huawei, urged governments to consider the whole range of policy factors, not just technological factors. The planning process should be simplified and tax incentives and spectrum need to be rationalized. Governments need to involve educational institutions and communities about how best to develop policy mixes, with up-to-date data to make good, informed policy choices.

Mr. Dominik Rozkrut, President of Statistics Poland described how NSOs are close to policy-making and can establish sound relationships with political institutions to create a virtuous circle of evidence-based decision-making. Poland is producing new statistics for Industry 4.0 and other areas. Regulators and NSOs are becoming more responsible for data governance issues, including consumer protection.

The ensuing discussions focused on how to measure ICT value-added, the challenges of the fourth Industrial Revolution for data collection, the impact of automation on employment, how to supplement and combine new data sources with old sources, the role of household surveys and the productive use of Universal Service Funds.

Session 2: Data needs for tracking the social impact of ICTS

Ms. Nagwa El-Shenawy, of the Ministry of Communication and IT of Egypt, moderated this Session. She observed that ICTs are changing our lives profoundly, and the ways data are analyzed have to change.

Mr. Ingmar Weber of Qatar's Computing Research Institute (CRI), presented his analysis of data from social media platforms to assess digital gender gaps and predict mobile phone ownership. Online social media platforms provide potentially useful aggregate information on their users at scale (>2 billion users), publicly available and with real-time estimates of anonymized and aggregated/disaggregated data by gender, age, location, country of origin. However, this analysis relies on the company's methods and selection biases, so these data are best used alongside other sources, such as opinions, demographics and content analysis.

Mr. Aaron Smith presented Pew Research Center's work studying the social impact of digital technologies. This work aims to understand how users perceive automation, AI, the future of work, policy engagement, harassment, interpersonal relationships, trust and misinformation. On the upside, people view ICTs as more efficient, mobile phones become valued 'partners', and people speak fondly of the new financial and educational opportunities they can access. On the downside, users consider social media is facilitating political extremism and 'fake news' and having some negative impacts on family life.

Mr. Maximiliano Salvadori Martinhão of the Ministry of Science, Technology & Communications described Brazil's experience in producing relevant and comparable data. Surveys in Brazil are carried out by CETIC.Br and are funded by the Registry for Domain Names .br, so the Government budget is not impacted. Brazil has a multi-stakeholder arrangement which strengthens the results of their survey. Stakeholders must collaborate more closely – the Ministry meets regularly with civil society and other groups to define guidelines for data analysis. AI and ML will become important in producing data needed by the Government. Discussions covered the accuracy and representativeness of social media data, with different platforms popular in different countries and regions.

Session 3: Enabling sustainable development through ICTs: Leaving no one behind (Partnership on Measuring ICT for Development session)

Mr. João Noronha of Anatel (Portugal) and Chair of EGTI, moderated this Session, which was organized by the Partnership on Measuring ICT for Development.

Mr. David Souter of ICT Development Associates presented the work related to the development of the thematic list of ICT indicators for the Sustainable Development Goals (SDGs). The thematic list aims to monitor availability and use of ICTs in different sectors relevant to the SDGs. He emphasized that the world is moving away from what has happened, towards predictions on what will happen. Measuring SDG outcomes is important. At the WSIS Forum 2017, the Partnership launched the Task Group to prepare a framework for indicators. There are four challenges: (1) to improve the availability and value of datasets, gather data systematically, consistently, more often, in greater detail. (2) Disaggregation. (3) Relevance – only what can be proven should be claimed, and causality is difficult. (4) ICTs are changing rapidly, so difficult to measure.

Ms. Scarlett Gil of UNCTAD described how ICTs are explicitly mentioned in SDGs 4, 5, 9 and 17. The Task Group has also noted ICT indicators could be used to measure progress in 11 out of 17 SDGS. UNCTAD is responsible for measuring ICT in business indicators. She described issues of data availability, the use of proxy indicators and the need for sound methodologies, definitions, and technical support. In order to engage effectively in international trade, countries have to be able to engage in digital trade.

Mr. Tim Kelly of the World Bank described how the World Bank assists with data collection and implementation for the SDGs. The Bank published the *Digital Dividends Report* in 2016 exploring the impact of ICTs on development, "*ICT4D 2018: Data-Driven Development*" and the Atlas of the SDGs, which visualizes progress towards the SDGs. The World Bank is expanding its work on digital identity. Discussions emphasized the importance of disaggregated indicators and focused on the quantity and quality of data needed for the SDG indicators. He highlighted that big data create useful possibilities, but may never replace traditional sources of data obtained through surveys. At the same time, social media data can fit into this collage of evidence, but they have substantial weaknesses. Mr. Kelly observed that we are at a critical junction as basic telecom indicators are becoming harder to collect, prompting the need for a reflection about how to change approaches.

The Symposium welcomed the work currently being done by the Partnership Task Group on SDGs related to the development of a thematic list of ICT indicators. The Symposium emphasized the importance of having disaggregated data, clear concepts and definitions for the indicators to be included in the list. Once the list is established, there is a need to build capacity in countries to improve the quantity and quality of the data for the indicators.

Session 4: Data science and ICTs

Mr. Alexandre Barbosa of CETIC.br, Brazil moderated this Session, which described the growth of Artificial Intelligence (AI), Machine Learning (ML) and Internet of Things (IoT) and emphasized the importance of exploring new data sources, including large datasets generated by ICT users.

Mr. Emmanuel Letouzé of the Data Population Alliance described the data revolution, the impact of big data on society and why measurement matters. He highlighted that it is no longer a question of whether we are living in a digital dream or a digital nightmare. There is the need to examine how to use AI algorithms at scale for human development to be able to explore facts using available data. AI is very good at finding the right relationships between input and output data when algorithms are trained well over millions of times and are now very good at analyzing available data and reaching the right result. Most people now leave a digital trace. He described his project to query telco data, without data ever leaving operators' servers, as one way of trying to get the value out of data at reduced risk. However, building expertise and combining skills and data science are critical. He explained that countries may not need dedicated data scientists, if national statistical offices (NSOs) and regulators can work together and combine available human resources with different expertise.

Ms. Sofia Kyriazi of UNHCR described UNHCR's work and the 'Jetson model' for analyzing internal displacements in Somalia, and predicting one month ahead on how many people will arrive in a region. The model is a screening tool to enable UNHCR to carry out its job faster and more efficiently. UNHCR's finance department is also collecting indicators for hitherto manual processes. The UNCHR's projects can

help analyze how outcomes affect policies, and change the way UNHCR operates. Discussions focused on bias in data.

The Symposium recognized the importance of exploring new data sources for official statistics, in particular the large data sets generated by users of ICTs. Artificial intelligence (AI) or machine learning can be used to analyze big data sets and the growth of the Internet of Things (IoT). The Symposium emphasized the importance of building expertise, human AI, which is useful for analyzing and using available data for policymaking. Further, the symposium emphasized that the combination of skills in data science and modern data tools are critical in unlocking the potential of the new data sources. The session further highlighted the importance of improving access to data, and making tools available that are necessary to analyze the data for policymaking needs.

Tuesday 11 December 2018

Mr. Cosmas Zavazava of ITU launched the Measuring the Information Society Report 2018 and described its structure and main findings – there continues to be a general upward trend in the access to and use of ICTs and Internet usage has crossed the halfway point with 51.2 per cent of the world population using the Internet by the end of 2018. Vol. I describes trends in ICTs while Vol. II of the report provides the state of ICTs in each of the Member States, as reported by ITU Member States. He mentioned that ITU will not publish the IDI this year, due to the large amount of missing data, but will engage in capacity-building with its Member States.

Session 5: Measuring the Information Society Report (MISR)

Mr. Dhanaraj Thakur of the Web Foundation moderated this Session. He introduced MISR 2018, which includes policy analysis, important and unique data, and analysis of key themes such as broadband, AI and IoT.

Mr. Martin Schaaper of ITU presented Chapters 1 and 2 on ICT trends and ICT skills. He emphasized that despite significant progress, still more work is needed to achieve the ITU *Connect 2030 Agenda* and Broadband Commission targets. He presented key ICT trends which showed that growth rates vary between regions and are starting to decrease in some parts of the world. He noted that the number of mobile-cellular subscriptions outnumber people in 2018 while the strongest growth among the key ICT indicators is in mobile broadband. Fixed telephony is decreasing while the number of fixed-broadband subscriptions is higher than the number of fixed telephone subscriptions. In addition, international bandwidth is increasing strongly, driven by the demand for data-intensive services by a growing number of Internet users. He concluded by presenting some of the key findings of the chapter on ICT skills, which showed that operational, information management, social skills and content creation skills are all important for gaining employment. However, there is insufficient clarity about how these are defined, and how they should be measured. Therefore, results and data coverage are variable.

Ms. Esperanza Magpantay of ITU described the main findings of Chapters 3 and 4 on revenues, investment and ICT prices related to mobile and fixed services. She highlighted that globally, telecom revenues make an important contribution to the economy at around US$ 1.7 trillion or 2.3 per cent of

global GDP in 2016, but they have declined from 2014 to 2016. Mobile voice revenues are declining globally, at around 50 per cent of revenues in 2016. Mobile users are moving from traditional voice and SMS to social media and OTT apps. New revenue streams such as OTT, big data, blockchain and IoT offer prospects of new opportunities. The share of capex in total telecom revenue is still growing, but it only impacts growth 2-3 years later. The Report also found that overall, ICT prices are declining, but this trend varies between regions and within regions. Over half of all countries have achieved the Broadband Commission's ICT price target. She concluded the presentation by mentioning the new ITU ICT price visualization tool that could be used by countries to benchmark ICT prices against regions and countries.

During the discussions that followed, participants welcomed the report and asked about sources of new revenue, the introduction of 5G, price reductions and affordability and trends in capex.

Session 6: The ICT Development Index

Mr. Johannes Bauer of Michigan State University moderated this Session, which emphasized that the IDI is ITU's key data and benchmarking tool and provided an overview of the revised IDI and methodology, calculation and results, including sensitivity analysis.

Ms. Vanessa Gray of ITU stated that, in response to calls from Member States to make the index stronger, the IDI was changed in 2018, with three indicators dropped and six new indicators added. The revised list poses challenges for Member States in terms of data collection. Many countries were not able to provide data for various indicators in 2018, therefore 58 per cent of the data for the IDI had to be estimated, which affects the robustness of IDI scores. Due to the lack of data, ITU had to postpone the production of the IDI for 2018, and plans to publish a better and stronger index in 2019. The IDI remains an inclusive index that covers a large number of countries.

Ms. Daniela Benavente presented her analysis on the "missingness" of the data. Missing data decreases with income and increases with the vulnerability of countries – it decreases with population and GNI and by region. She also highlighted that the idea of imputation is possible and seductive, but misleading.

Giulio Caperna of the Joint Research Centre presented his work using Principal Components Analysis (PCA) of IDI scores and rankings for statistical coherence. He reviewed the development of the IDI from a methodological point of view for robustness and transparency. He concluded that the conceptual framework is statistically sound, coherent and balanced and robust, but the main issue is the missingness of data.

During the discussions that followed, participants welcomed suggestions to increase capacity-building to help countries improve data availability and to publish the IDI in 2019. The Symposium highlighted the importance of a robust IDI methodology, the choice of indicators, and the transparency of ITU estimates. It also highlighted the importance of submission by countries of complete data in a timely manner that could be used to ensure that the IDI remains an inclusive index that covers a large number of countries.

Session 7: ICT skills for the future

Mr. Dominik Rozkrut of Statistics Poland moderated this Session, which explored the types of skills needed to use these ICTS effectively and how to measure skills.

Mr. Yushi Torigoe of ITU made a presentation about ITU's work in the area of capacity-building and ICT skills. He highlighted the need to define and mainstream digital skills, innovation skills provision for the digital economy and anticipate changing skill needs. ITU supports the development of skills by working together at the global, regional, and international levels.

Ms. Silvia Montoya, Director of the UNESCO Institute for Statistics (UIS), described UNESCO's work on the methodology of a digital skills framework. There are two indicators for SDG target 4.4, Indicator 4.4.1 (Proportion of youth/adults with ICT skills) and Indicator 4.4.2 (minimum level of proficiency in digital literacy skills), but they are self-reported. UIS has undertaken a consultation and a framework of the skills needed and the use cases. She described the methodological challenges in the assessment of digital literacy. To date, best practices include DigComp in Europe; PIX in France; the Digital Competence Wheel in Denmark and MDS in Netherlands/UK.

Ms. Elif Köksal-Oudot of the OECD presented the OECD's *'Going Digital' Project* and annual skills surveys in the EU (ICT usage) and PIAAC (skills) with 26 profiles for ICT activities. She described four groups of user profiles: (1) diversified and simple; (2) practical uses – e-banking, e-health, e-commerce; (3) diversified and complex – eight activities on average needing technical knowledge; (4) ICT, information search and social networks. These categories broadly correspond by age and education: (1) young, less educated and out of employment. (2) Older, educated and in employment (3) 30-45, upper secondary/tertiary and mostly employed. (4) Older, less educated and mainly out of the labor force. There is a belief that skills do not change much, but in terms of ICT usage, every year, skills evolve to become more sophisticated.

Ms. Nagwa El-Shenawy, of the Ministry of Communication and IT of Egypt, described Egypt's experience with a household survey of ICT skills. The questionnaire will be used in the field at the end of 2018, with questions on skills and privacy settings. Egypt has a household survey and standalone survey with 11,000 households and individuals on their smartphone and computer use. Preparing surveys of this size has proved very challenging, but there is much to be learned from the results of this extensive and thorough survey.

The discussions concluded that the ability to use ICTs is critical, and more advanced skills needed. The Symposium learned about a number of digital literacy assessment instruments, but this is a very complex and expensive undertaking.

Session 8: New data needs for the digital economy (EGH session)

Ms. Alana Gorospe Ramos, Chief of DICT Philippines, moderated this Session.

Ms. Linah Ngumba of the Kenyan National Bureau of Statistics and Vice-Chair of EGH presented EGH's work reviewing indicators on household ICT access and individual ICT use, and the outcomes of its work. A sub-group on digital skills was created that proposed changes to the indicators on Internet activities and ICT skills. Another subgroup proposed changes to the indicator on location of Internet use. According to EGH, there is no need to add additional e-commerce or cybersecurity indicators to ITU's statistics survey. She discussed recommendations and proposals for next year's work programme. Finally, she presented

on Kenya's experience with collecting indicators on mobile money and m-banking through an ICT household survey. Mobile money transfers have grown massively, from USD 18.6 billion dollars in 2013 to USD 35.5 billion in 2018. 3.3 million people engage in mobile banking, while 18 million are active in a mobile money system. Most people using mobile banking have 2 SIM cards, while half of all mobile money customers have 2+ SIM cards.

Ms. Mariya Stoilova of LSE presented the work of the Global Kids Online Network on child online protection. Children have very different experiences, skills and needs when it comes to Internet use, but it is surprising how little Internet research is devoted to children's Internet use. In some countries, children are leading the way – in Ghana, only 3 per cent of children have **not** used the Internet, compared to 55 per cent of adults. She presented the work of Global Kids Online Network in four countries – Argentina (with strong urban-rural divides), Serbia (with many ethnic minorities), Philippines (with online sexual exploitation) and South Africa (with poverty). This survey aims to assess how use of the Internet can contribute positively to children's lives, but can also prove problematic for kids' lives. She presented the list of questions. It is vital to work with parents in this regard, who form an important part of the picture.

Wednesday 12 December 2018

Session 9: Smart Data for smart ICT regulation and policy-making (EGTI session)

Ms. Annie Baldeo, Executive Officer of TATT, Trinidad and Tobago moderated Session 9, which addressed smart data for smart ICT regulation and policy-making.

Mr. João Noronha of Anatel (Portugal) and Chair of EGTI highlighted EGTI's work over the last year and proposals for its future work in 2019 including the continuation of discussions related to 5G and IoT, international roaming, fixed-broadband Internet traffic (a sub-group will be created within EGTI), Quality of Service (QoS) (a sub-group will be created within EGTI) and revision of existing indicators. EGTI has 1,014 registered members. The EGTI meeting held in October was attended by 127 participants from 54 countries discussing 7 agenda items

Mr. Muhammad Arif Sargana, Director of Economic Affairs of PTA, presented Pakistan's experience in ICT data for digital services. He emphasized that policy-makers need smart data, and more and better-quality data and statistics are needed by policy-makers in: (1) taxes on ICTs (2) Digital financial services and (3) e-commerce. He mentioned that high tax rates are an issue, as Governments see the telecom sector as a ready source of tax revenues. In Pakistan, the GST is 17 per cent in other sectors, while it is 19.5 per cent for telecom, and there is a 38 per cent customs duties on mobile handsets. The regulator, PTA, has been working to reduce taxes on telecom.

Ms. Ana Lucrecia Segura of SUTEL Costa Rica, who was introduced by the Vice-minister of the Ministerio de Ciencia, Tecnología y Telecomunicaciones, presented Costa Rica's Big Data project. She mentioned that Costa Rica introduced its General Telecoms Law in June 2008. SUTEL established a unit to gather data on private network services in January 2009, and first started publishing reports in 2012. The first survey in 2011 captured data from 70 per cent of service providers across 250 indicators. She presented SUTEL's initiatives including improving its human capacity and moving from standard tools to Business Intelligence indicators, as well as interactive price comparison tools and apps for users. Questions covered new methods of collecting and visualizing data.

Session 10: Affordability of ICT Services

Mr. Kalvin Bahia of GSMA Intelligence moderated this Session.

Ms. Shazna Zuhyle of LIRNEAsia presented LIRNEAsia's work surveying public demand for ICT services, barriers to mobile phone ownership, prices and the lack of relevance of Internet for people in a number of Asia-Pacific countries. This work surveys people online, not devices or SIM cards. She highlighted that high prices remain a barrier for ICT use. She further outlined links between the digital gender gap, affordability, geography and devices for various economies and emphasized that awareness plays an important role in getting people online. She mentioned different concerns between higher income brackets (who worry about cybersecurity, privacy) and lower income brackets (people worry about affordability). Quality of Service (QoS) remains a concern for users in the middle income brackets. She also presented and explained in detail the new ITU ICT price baskets methodology, revised during the EGTI 2017 meeting and used to collect ICT prices from 2018, to reflect changes in consumption patterns, and higher data caps for fixed and mobile broadband baskets.

Mr. Dhanaraj Thakur of the Web Foundation presented the work of the Web Foundation on affordability. He described the use of USFs, the role of national policy and National Broadband Plans, infrastructure sharing and spectrum management. The Web Foundation recommends: (1) Developing cost reduction strategies rooted in a country's unique geographical challenges; (2) developing or update NBPs with concrete targets and timelines (including those for gender); (3) Implementing policies for public access and USFs; and (4) supporting infrastructure development (including rights of way and spectrum allocation). The ensuing discussion focused on affordability and the digital divide.

Presentation of Chair's summary and closing ceremony

The Chairman of the Symposium, **Mr. Al Ramsi**, presented a short summary report of the Symposium.

In closing, **Mr. Cosmas Zavazava of ITU** expressed his appreciation to everyone and especially the Chair of WTIS, Mr. Mohamed Al Ramsi, and the Expert Groups for all their work. He thanked Member States for their support, and reaffirmed the commitment of ITU to work with all stakeholders to improve data and statistics, including through capacity-building. Participants watched a short video on WTIS-2018.

Mr. Brahima Sanou, Director of BDT, thanked all who attended. 85 countries were represented at WTIS-2018. Attendance has grown over the years, underlining Member States' commitment to high-quality data and statistics. Bringing half the world's population online is a great achievement, but it is important to remember that half the population is still not online. To this end, ITU must work tirelessly to help bring everyone online and not to leave anyone behind. The BDT Director thanked all participants and the Chairman, Mr. Al Ramsi, and closed the meeting.