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Measuring the Information Society Report

Executive summary

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Chapter 1. The Current State of ICTs

More than half of the world's population is now online. At the end of 2018, 51.2 per cent of individuals, or 3.9 billion people, were using the Internet. This represents an important steps towards a more inclusive global information society. In developed countries, four out of five people are online, reaching saturation levels. In developing countries, though, there is still ample of room for growth, with 45 per cent of individuals using the Internet. In the world's 47 least-developed countries (LDCs), Internet uptake remains relatively low and four out of five individuals (80 per cent) are not yet using the Internet.

There continues to be a general upward trend in the access to and use of ICTs. With the exception of fixed-telephony, all indicators showed sustained growth over the last decade. However, in recent years, growth is slowing for most of the access indicators, particularly in countries where large parts of the population are already connected. Growth will need to pick up again if the ambitious targets of the ITU Connect 2030 Agenda and the Broadband Commission for Sustainable Development are to be met. These include a target of 70 per cent Internet penetration by 2023, and 75 per cent by 2025.

Mobile access to basic telecommunication services is becoming ever more predominant. While fixed-telephone subscriptions continue their long-term decline, mobile-cellular telephone subscriptions continue to grow. Although the number of mobile-cellular telephone subscriptions is already greater than the global population, the same is not true in all regions. It can be expected therefore that developing countries, and especially LDCs, will slowly catch up with the rest of the world.

Broadband access continues to demonstrate sustained growth. Fixed-broadband subscriptions are continuously increasing, without a slowdown in growth rates. Furthermore, almost all fixed-broadband subscriptions had download speeds of at least 2 Mbit/s, with a very substantial part having advertised speeds of more than 10 Mbit/s. In LDCs, there is still a significant pocket of subscriptions for the lowest speed tier (≥256 kbit/s to <2 Mbit/s), although that proportion is decreasing rapidly. The growth in active mobile-broadband subscriptions has been much stronger, with penetration rates increasing from 4.0 subscriptions per 100 inhabitants in 2007 to 69.3 in 2018.

Almost the whole world population now lives within range of a mobile-cellular network signal. In addition, most people can access the Internet through a 3G or higher-quality network. This evolution of the mobile network, however, is going faster than the growth in the percentage of the population using the Internet.

Internet access at home is gaining traction. Almost 60 per cent of households had Internet access at home in 2018, up from less than 20 per cent in 2005. Fewer than half of households had a computer at home, highlighting that a substantial number of households accessed the Internet (also) through other means, most importantly through mobile devices, often using the data plan of the mobile-broadband subscription. Three quarters of the world's population owned a mobile phone in 2017, but in LDCs this proportion stood at 56 per cent. Given the positive impacts of mobile phone ownership on development, this is an area where quick gains can be made.

Lack of ICT skills is an important impediment for people to access the Internet. Data show that, as activities get more complex, fewer people undertake these activities. More importantly, computer users in developed countries seem to possess more ICT skills than users in developing countries, pointing to a serious constraint on the development potential of developing countries and LDCs.

Growth in international bandwidth and Internet traffic has been even stronger than growth in access to ICTs and the percentage of the population using the Internet. This could be explained by the fact that people spend more time online, and more and more spend that time doing data-intensive activities, such as watching videos and playing interactive games.

Chapter 2. ICT Skills for the Future

There is an increased need for "soft" skills beyond technical and navigational skills. A breadth of skills – including technical operational, information management, social and content-creation skills – will be fundamental for achieving positive and avoiding negative outcomes. Furthermore, algorithms, the proliferation of bots, and a shift to the Internet of Things and Artificial Intelligence, augment the need for critical information and advanced content-creation skills. With the increased complexity of ICT systems, and an exponential increase in the amount of data being collected, transferable digital skills and lifelong learning are indispensable.

ITU data and other cross-nationally comparative data sources show that there are considerable gaps across the board in the skills needed at all levels. A third of individuals lack basic digital skills, such as copying files or folders or using copy and paste tools; a mere 41 per cent have standard skills, such as installing or configuring software or using basic formulas on spreadsheets; and only 4 per cent are using specialist language to write computer programs.

Scarce data suggest developing countries are particularly disadvantaged when it comes to digital skills. There is a lack of data collected on skills in developing regions, but the available data suggest that inequalities reflect other inequalities between the different regions of the world, particularly in relation to basic skills. The patterns for standard skills are less clear.

Within-country inequalities in basic and standard skills reflect historical patterns of inequality. On average, those in employment were ten percentage points more likely to have a skill than the self-employed, who are in turn ten percentage points more likely than the unemployed to have a skill. Those with tertiary education are around 1.5 to 2 times as likely to have a skill than those with upper secondary education, and 3.5 to 4 times as likely as those with only primary education. Individuals in rural areas are about ten percentage points less likely than urban dwellers to have a skill. Finally, there is a five percentage point difference between men and women in having a certain skill.

There are skill inequalities between children as much as there are between adults. While little data are available on this outside of Europe, available data suggest that digital inequalities are not a generational thing and will persist into the future.

There are clear gaps in data collection for certain countries and groups, and a limited range of methodological tools is used to collect these data. Proxy survey measures (e.g. asking about use to measure skill) and self-reported skill measures are most common. Recently, self-reported skill measures using scales that have been validated through performance tests (performance test survey proxies) have been developed. The least common are actual performance tests or formal exams; in most cases, these are sector- and context-specific. It is recommended to develop survey measures that can be used for larger populations that have been validated to avoid response biases.

There is an urgent need for the development of measures across the range of operational, information management, social and content-creation skills. These items should be device- and platform-independent, measure skills rather than activities, and limit social desirability bias in the design of their answer scales. Furthermore – to understand the skills gap in relation to a potential future in which ICTs are embedded and invisible – the development of critical information, communication and data management, and production skills measures is desperately needed.

Survey measures used in most internationally comparative studies have severe shortcomings. They lack variety (measure only a narrow range of operational skills), comparability (have not been tested to be fit for cross-cultural comparisons), adaptability (are not transferable, as they are associated with specific platforms or activities rather than a core "curriculum" of future proof skills) and equity (have not been validated as comparable assessment tools for different subgroups across highly diverse populations).

The utmost priority is to make digital skills policies in relation to gaps in the labour market and concerns about widening social inequalities more effective. This can be done by (a) collecting higher-quality and more reliable data on the full range of digital skills in different sectors; (b) targeting specific groups depending on need and outcomes to be achieved, rather than following a one-size-fits-all approach; and (c) instead of establishing funding principles and incentives around success, where only best practices are shared, by stimulating multisectoral stakeholder partnerships with a continuous exchange of lessons learned and improvements made.

Chapter 3. ICT Revenue and Investment Trends

The telecommunication sector plays an important role in the global economy, with global retail telecommunication revenues reaching USD 1.7 trillion in 2016, representing 2.3 per cent of global GDP. At regional level, the importance of the sector in driving economic growth is clearly noticeable, especially in the developing world. Telecommunication revenues in 2016 represented on average 3 per cent of GDP in Africa and the Arab States, compared to 2 per cent in Asia and the Pacific and the Americas (excluding the United States and Canada), and less than 2 per cent in the CIS and Europe.

However, hit by greater market maturity levels, the telecommunication sector has reported sluggish performance between 2014 and 2016. Global retail telecommunication revenues declined by 5 per cent during the period, as mobile-cellular penetration crossed the 100 per cent mark in 2016. In parallel, the number of full-time equivalent employees working for telecommunication operators declined by 6 per cent globally between 2014 and 2016.

Fixed-line revenue represented half of telecommunication revenues generated in 2016 worldwide. Fixed-mobile convergence, multi-play services and the race to deliver on the promise of smart societies, are gaining in importance in mature markets, where subscriptions and revenue growth are stalling. For instance, in Europe, consolidation and the ability of converged operators to leverage ownership of fixed assets and content to support mobile is seen as a way of promoting more sustainable mobile markets.

Globally, mobile revenues declined by 7 per cent between 2014 and 2016, from USD 924 billion in 2014 to USD 859 billion in 2016. As mobile becomes ubiquitous across most regions, growth in mobile revenues is stalling. Between 2014 and 2016, mobile revenues declined by 10 per cent in the developing world, compared to 5 per cent in the developed world. There is a correlation between economic growth and mobile revenue growth in markets where prepaid is dominant – more than four in every five mobile subscriptions in the developing world were prepaid in 2016.

Mobile revenue growth is reliant on the monetization of mobile Internet services. However, between 2014 and 2016, the global increase in data revenues (USD 70.2 billion) was lower than the loss recorded in voice revenues (USD 114.6 billion). In fact, Asia and the Pacific and the United States/Canada were the only two regions in which the increase in mobile data revenues during the period was greater than the loss in voice revenues. Overall, the relative importance of data revenues over mobile revenues is correlated with a country's Internet penetration. In most developing economies, mobile-broadband subscriptions have grown enormously, countering the slowdown recorded in mobile-cellular subscription growth and supporting the growth in data revenues.

Mobile revenue growth is impacted by the uptake in over-the-top (OTT) services. The success of IP-messaging apps is often to the detriment of traditional text usage and the associated revenue. Globally, the number of SMS messages sent fell by half between 2014 and 2016, from 6 trillion text messages in 2014 to just under 3 trillion in 2016. As a result, global SMS revenues fell from USD 82 billion in 2015 to USD 75 billion in 2016, and analysts expect that global SMS revenues will continue to decline in the next few years.

The ICT sector is characterized by large infrastructure investments, with growth in telecommunication capital expenditure (capex) driven largely by data demand in developing economies – where mobile-broadband penetration remained below the 50 per cent mark in 2016. Globally, telecommunication capex went up by 4 per cent between 2014 and 2016, from USD 340 billion in 2014 to USD 354 billion in 2016. Investments in developing economies are largely driving this growth, with capex increasing by USD 23.5 billion during this period, compared to a USD 10 billion reduction in the developed world.

These trends denote a market context in which financial pressures and intensifying competition are forcing service providers to transform their business models to look for new revenue streams. Growth of the Internet of Things (IoT) and machine-to-machine (M2M) communications is creating revenue opportunities for service providers operating in mature markets, which may help to offset declining revenue trends in core business segments. As IoT revenue and investment opportunities are scaling up, certain enablers, such as Artificial Intelligence, big data analytics (BDA) and Blockchain, are gaining momentum. These emerging solutions are helping businesses to boost revenues, lower their cost base, and gain in efficiencies and competitive edge, while laying the foundation for "smart societies".

Chapter 4. ICT Price Trends

Information and communication technology (ICT) prices have dropped globally in the last decade, in parallel with the increase in access to and use of ICT services. Improved ICT regulation and policy-making have played a pivotal role in creating the conditions for the reduction of prices seen in the period 2008–2017, ensuring that the efficiency gains of higher ICT adoption are partly passed on to customers.

Mobile-cellular prices followed a sustained decreasing trend in the period 2008–2015. From 2015, mobile-cellular prices have plateaued and the ITU mobile-cellular basket (51 minutes and 100 SMS messages per month) cost on average USD 12.5 per month at the end of 2017. This is half the average price of the fixed-broadband basket, but 35 per cent higher than the average for the handset-based mobile-broadband basket, thus suggesting that there is still room for lower mobile-cellular prices.

Some of the most populous countries worldwide – such as Bangladesh, China and India – stand out for having achieved mobile-cellular baskets under USD 3 per month and feature among the top 20 countries with the lowest prices. A number of least developed countries (LDCs) also offer prices below USD 3 per month, including Bhutan, Ethiopia, Myanmar, Nepal (Republic of) and South Sudan.

The price of a handset-based mobile-broadband basket including 500 MB per month followed a decreasing trend worldwide in the period 2013–2016, but plateaued at USD 9.3 per month in 2017. The global average was driven down by strong reductions in prices in developing countries (compound annual growth rate (CAGR)-24 per cent in USD terms from 2013 to 2016) and, in particular, in LDCs (CAGR-36 per cent in USD terms from 2013 to 2016). The price of a computer-based mobile-broadband basket including 1 GB per month followed a similar trend as the handset-based mobile-broadband basket. Despite the sustained decrease in prices in developing countries and LDCs, average data allowances continued to increase. For instance, in LDCs, data allowances increased from 800 MB per month in 2014 to 1 GB per month in 2017 for the handset-based mobile-broadband basket, and from 1.7 to 3.2 GB per month for the computer-based mobile-broadband basket.

In 2017, almost all developed countries had computer-based mobile-broadband prices corresponding to less than 2 per cent of gross national income (GNI) per capita (p.c.), thus already meeting the 2025 target set by the Broadband Commission. Similarly, 34 per cent of developing countries also offered computer-based mobile-broadband plans representing less than 2 per cent of GNI p.c. in 2017. On the other hand, most of the countries not yet having met the 2015 affordability target set by the Broadband Commission (i.e. broadband prices representing less than 5 per cent of GNI p.c.) were LDCs. The affordability of prepaid handset-based mobile-broadband services in these LDCs gives a strong indication that it might be the best vector for ensuring affordable Internet access to all, if operators in these countries are able to maintain current price levels while continuing the progressive increase in data allowances observed in previous years.

The price of an entry-level fixed-broadband plan has significantly decreased worldwide in the last decade, from more than USD 40 per month on average in 2008 to USD 25 per month in 2017. The most remarkable reduction in prices has been recorded in LDCs, where prices have been cut two-thirds since 2008. However, the price of an entry-level fixed-broadband plan corresponds on average to 12 per cent of GNI p.c. in developing countries, whereas evidence from household surveys shows that household expenditure on ICT as a percentage of total household expenditure is below 8 per cent in all countries with data available. This suggests that the economic commitment that an average family in the developing world would need to face to connect to the Internet at home is larger than the average share of budget allocated to ICTs in most countries.

More than one in four countries in the Commonwealth of Independent States, Asia and the Pacific, and the Arab States have entry-level fixed-broadband prices that represent less than 2 per cent of GNI p.c. In Europe, three out of four countries have fixed-broadband services meeting the 2 per cent target set by the Broadband Commission for 2025. Fixed-broadband prices are the least affordable in Africa, although countries such as Botswana, Cabo Verde, Gabon, Mauritius, Seychelles and South Africa have achieved prices below the 5 per cent threshold set by the Broadband Commission for 2015.

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