Measuring the Information Society Report 2017

Executive summary

Chapter 1. The current state of ICTs

The latest data on ICT development from ITU show continued progress in connectivity and use of ICTs. There has been sustained growth in the availability of communications in the past decade, led by growth in mobile cellular telephony and, more recently, in mobile broadband. Growth in fixed and mobile-broadband infrastructure has stimulated Internet access and use.

Mobile-cellular networks are increasingly pervasive and now dominate the provision of basic telecommunication services. The number of mobile-cellular subscriptions worldwide now exceeds the global population, although many individuals, especially in developing countries, still do not use a mobile phone. The number of fixed-telephone subscriptions has continued to fall, dropping below 1 billion worldwide, and is particularly low in the least developed countries (LDCs).

There has been rapid growth in mobile-broadband services. The number of mobile-broadband subscriptions worldwide now exceeds 50 per 100 inhabitants, enabling improved access to the Internet and online services. The introduction of new mobile technologies is accelerating this trend, with LTE or higher capabilities now available to most mobile users. There has been slower growth in the number of fixed-broadband subscriptions worldwide, although this now marginally exceeds that for fixed telephone lines.

There are substantial digital divides between countries and regions, and between developed and developing countries, particularly LDCs. There are twice as many mobile-broadband subscriptions per 100 inhabitants in developed countries compared to developing countries, while the gap between more-connected developing countries and LDCs has grown in recent years. Mobile-broadband subscription rates are much higher in Europe and the Americas than in other regions, and more than three times those in Africa. Subscribers in developed countries also tend to benefit from higher bandwidth than those in developing countries.

These divides are evident in Internet use as well as connectivity. More than half of all households worldwide now have access to the Internet, although the rate of growth appears to have fallen below 5 per cent a year. Households in developed countries are almost twice as likely to be online as those in developing countries and more than five times as likely as those in LDCs. There are similar differences between rates of access for individual users. People in Europe are more than three times more likely to access the Internet regularly than those in Africa, and are likely to benefit from higher access speeds when doing so.

There is a significant gender digital divide. Data compiled by ITU suggest that this digital gender gap is relatively small in developed countries, more pronounced in developing countries and substantial in LDCs, where only one in seven women is using the Internet compared with one in five men. The gender digital divide in Africa appears to have grown significantly over the past five years.

Young people are more likely to be online than their elders. The proportion of people aged between 15 and 24 who are online is estimated to be over 70 per cent worldwide, compared with just 48 per cent of the population overall. Elderly people are less likely to be connected.

Chapter 2. The ICT Development Index – global analysis

The ITU ICT Development Index (IDI) is a unique benchmark of the level of ICT development in countries across the world. The IDI combines eleven indicators on ICT access, use and skills, capturing key aspects of ICT development in one measure that allows for comparisons to be made between countries and over time. IDI 2017 covers 176 economies worldwide. Comparison with IDI 2016 shows that progress has continued to be made in ICT access and use in almost all countries. However, it also demonstrates that there are still great disparities in ICT development between more and less connected countries which need to be addressed if inclusive information societies are to contribute to the achievement of sustainable development and other international goals.

Iceland tops the IDI rankings in 2017, with an IDI value of 8.98. It is followed by six other countries in Europe and three economies in the Asia-Pacific region which have competitive ICT markets that have experienced high levels of ICT investment and innovation over many years. Countries at the top of the IDI distribution also have high levels of economic prosperity, literacy and other skills that enable citizens to take full advantage of access to communications.

The average value for all economies in the Index rose by 0.18 points between IDI 2016 and IDI 2017, reaching 5.11 points, the first time that it has exceeded the halfway point along its scale. As in IDI 2016, improvements were particularly significant among countries in the middle of the distribution, many of which are middle-income developing countries, although there were only limited changes in positions in the rankings. The most substantial improvements in IDI value were recorded by Namibia, the Islamic Republic of Iran and Gabon, all of whose values rose by 0.50 points or more. All but eight countries improved their overall IDI values.

As in previous years, the ICT use sub-index grew more rapidly, by 0.31 points, than did the access and skills sub-indices, both of which rose by an average 0.10 points. The most significant contribution to improvements in IDI values was made by the indicator for mobile-broadband subscriptions, the average value for which rose by 12.9 per cent during the year. The indicator for fixed-telephone subscriptions, by contrast, continued to show a gradual decline in the majority of countries.

The reduction of the digital divide between more and less connected countries continues to be challenging. The gap between the highest and lowest performing countries in the Index rose to 8.02 points (out of 10.0) in IDI 2017. As in previous years, there is a strong association between economic and ICT development, with least developed countries (LDCs) filling 37 of the 44 places in the lowest (least connected) quartile of the distribution. LDCs improved their average IDI value by 0.15 points during the year, compared with 0.22 points for other developing countries, suggesting that they may be falling further behind in ICT development.

Recent developments in ICT markets have led to the adoption of proposals for change in the composition of the Index. A revised set of indicators will be introduced from IDI 2018 which should add further insights into the performance of individual countries and the relative performance of countries at different development levels.

Chapter 3. The ICT Development Index – regional and country analysis

There are considerable differences between geographical regions in the levels of ICT development as demonstrated by the IDI. There is also significant variation in the experience of individual countries within each region. The differences in the IDI between regions and individual countries are associated mainly with levels of economic development.

Europe continues to lead the way in ICT development. It has the highest average IDI value among world regions (7.50 points). This reflects the region's high levels of economic development, competitive communication markets, and high levels of ICT skills. Every country in the Europe region has an IDI value above the global average. As many as 28 of its 40 countries rank within the highest quartile, while only one, Albania, falls outside the top half of the distribution. The most substantial improvements in value were recorded by Cyprus and Turkey.

The United States and Canada top the IDI ranking in the Americas region. The majority of countries in the region fall within the two middle quartiles, with only two least connected counties (LCCs) in the bottom quartile (Cuba and Haiti). The most significant improvements in the Americas region were recorded by middle-ranking countries in South and Central America and the Caribbean.

The Commonwealth of Independent States (CIS) is the most homogeneous region in ICT development, reflecting its relative economic homogeneity. Only one country in the region, Belarus, is in the top quartile of the Index, but the region includes no LCCs. The most dynamic countries in terms of IDI value were those at the bottom of the regional rankings – Ukraine, Uzbekistan and Kyrgyzstan.

Asia and the Pacific is, by contrast, the most heterogeneous region in terms of ICT development. Seven economies in this region have IDI values above 7.50 points and rank within the highest quartile in the global IDI 2017, including the Republic of Korea, which is ranked second overall. However, ten countries in the region, including several with very large populations, are LCCs. Six countries improved their IDI values by more than 0.40 points, led by the second most dynamic country in IDI 2017, the Islamic Republic of Iran.

The Arab States region is also very diverse in terms of IDI performance. This region includes a number of oil-rich high-income economies, three of which are in the top quartile of the IDI, as well as a number of low-income countries, four of which are LCCs. The strongest improvements in this region were seen in middle-income countries, whose average value rose by more than twice that of countries at the top and bottom of the regional distribution.

Africa continues to be the region with the lowest IDI performance. The average value for this region in IDI 2017 is 2.64 points, little more than half the global average of 5.11. Only one country in the region, Mauritius, ranks in the upper half of the global IDI distribution, while 28 of the 38 African countries included in IDI 2017 fall into the lowest (LCC) quartile. This reflects the generally low level of economic development in the region. The region does, however, include two of the three countries which achieved the most dynamic improvements in their IDI value over the year – Namibia and Gabon.

Chapter 4. Emerging ICT trends

Concurrent advances in the Internet of Things (IoT), big data analytics, cloud computing and artificial intelligence (AI) will fundamentally transform business, government, and society over the coming decades. To harness their benefits, countries will need to create conditions supportive to the deployment of next-generation network and service infrastructures. They will also have to adopt policies that are conducive to experimentation and innovation while mitigating potential risks to information security, privacy, and employment.

The Internet of Things will greatly expand the digital footprint. In addition to people, organizations and information resources, it will connect objects equipped with digital information sensing, processing, and communication capabilities. This ubiquitous infrastructure will generate abundant data that can be used to achieve efficiency gains in the production and distribution of goods and services, and improve human life in innovative ways.

Big data analytics will extract useful knowledge from digital information flows. It will enable us to better describe, understand and predict developments and to improve management and policy decisions. Making sense of proliferating information requires a workforce with appropriate analytical, computational and methodological skills, as well as a high-capacity ICT infrastructure.

Cloud and other architectures will lower the entry barriers to scalable computing resources. They are starting to deliver flexible and on-demand computational services over the Internet, lowering the fixed costs of ICT infrastructure, to the benefit of small and medium-sized organizations. Realizing their full potential will depend on the availability of reliable fixed and mobile broadband connectivity.

Artificial intelligence will help human beings to make better decisions. In order to achieve this objective, every algorithm needs to be tailored carefully to existing data and the objectives pursued. This requires considerable human expertise in machine learning and large datasets to train algorithms.

Advanced ICTs, such as IoT, big data analytics, cloud computing and AI, contribute to realizing the Sustainable Development Goals (SDGs). Promising applications exist in areas such as manufacturing, precision agriculture, government, education, health care, smart cities, and smart transportation. As part of broader initiatives, ICTs can contribute to achieving each of the 17 SDGs.

Harnessing the benefits of advanced ICTs requires appropriate infrastructures, services, and skills. Networks will have to support diverse quality-of-service demands from applications and users while delivering robust and ubiquitous connectivity. This will require roll-out of wireless IoT platforms, reliance on network virtualization and improved fibre connectivity. Moreover, it will require the development of advanced ICT skills among users.

Advanced ICTs raise concerns over next-generation digital divides. Network operators and users will have to adapt their business models to take advantage of the opportunities of the digital transformation. Policy-makers and regulators are called upon to create conditions facilitating entrepreneurial experiments and innovation. Policy will also have to mitigate challenges in the areas of information security, privacy, employment and income inequality.

Reliable and meaningful measurements of the deployment and use of advanced ICTs are critical. Fully harnessing the potential benefits of advanced ICTs requires reliable and meaningful metrics that go beyond existing data. This will require collaboration among various stakeholders and novel approaches to harvesting information from digital infrastructures and applications directly.