

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD



# FIFTEEN YEARS SINCE THE WORLD SUMMIT ON THE INFORMATION SOCIETY



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## 1. Introduction

In November 2005, the international community gathered in Tunis for the second and final session of the World Summit on the Information Society (WSIS). That gathering concluded a process, begun in 1998,<sup>1</sup> to build global understanding of the growing importance of information and communication technologies (ICTs) in many aspects of economy and society.

WSIS established a vision for the international multistakeholder community of ‘a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge,’ to promote sustainable development in their communities and improve their quality of life.<sup>2</sup>

Enormous change has taken place in ICTs since then. Technologies which were in their infancy at the beginning of this century have become mainstream, and in some cases already been displaced by later innovations. Mobile telephony has become geographically pervasive, while the Internet and online social networks have become important to the lives of majorities in many countries. Digitalisation has had major impacts on economies, public services and governance. Successive waves of new technologies have emerged, offering new opportunities and posing unexpected challenges for governments, businesses and individuals as expectations of the Information Society have rapidly evolved. The pace of technological development and the scope and scale of its impact on economy, society, culture and governance are accelerating.

There have been important developments in other international priorities alongside this, particularly the adoption by the United Nations (UN) of the *2030 Agenda for Sustainable Development* and Sustainable Development Goals (SDGs). ICTs will play a substantial role in delivering the SDGs.<sup>3</sup>

The General Assembly (UNGA) reviewed progress towards achieving WSIS’ goals after ten years in 2015, and committed to review them further, through a high-level meeting involving all stakeholders, after twenty years in 2025.

This report briefly summarises developments halfway between UNGA’s ten- and twenty-year reviews and suggests priorities for the assessment to be made in five years’ time.

- Section 2 summarises outcomes from the WSIS meetings.
- Section 3 describes the current state of access and connectivity.
- Section 4 describes the changing world of digital technology and services.
- Section 5 comments on underlying trends affecting Information Society development.
- Section 6 reviews developments concerning governance and human rights.
- Section 7 summarises challenges and priorities for UNGA’s twenty-year review.

## 2. WSIS outcomes

WSIS was held in two phases, in Geneva in November 2003 and Tunis in December 2005. The first phase adopted the *Geneva Declaration of Principles* and the *Geneva Plan of Action*, which focused on the development potential of ICTs, while the second adopted the *Tunis Commitment* and *Tunis Agenda for the Information Society*, which focused on financing mechanisms, Internet governance and the monitoring and assessment of WSIS outcomes.<sup>4</sup> The *Geneva Declaration* identified ten targets for connectivity over the period to 2015, progress towards which was assessed in the *Final WSIS Targets Review*, published by the Partnership on Measuring ICT for Development that year.<sup>5</sup>

These outcome documents established a framework for annual review and discussion of progress in different areas of ICT development involving all stakeholders, including governments, the private sector, civil society and relevant professional communities. Action Lines concerned with eleven areas of ICT policy and development are reviewed at the annual WSIS Forum, organised by ITU, while the Internet Governance Forum (IGF) provides an important space for discussion of Internet-related issues. Both are multistakeholder gatherings.

These outcomes form part of a much wider, rapidly evolving ecosystem of policymaking, standard-setting and discussion fora concerned with digital development and its intersection with other aspects of economy, society, culture and governance. ICTs now feature prominently in international discourse and negotiations concerned with almost every aspect of human development.

The United Nations and other international agencies have a crucial role to play, alongside governments, businesses and other stakeholders, in efforts to achieve the WSIS outcomes, integrate them with the SDGs, maximise their potential value and minimise potential risks.

### 3. Access and connectivity

Access and connectivity are necessary, but not sufficient, preconditions for the development of an Information Society. SDG9 commits the international community to ‘significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.’<sup>16</sup>

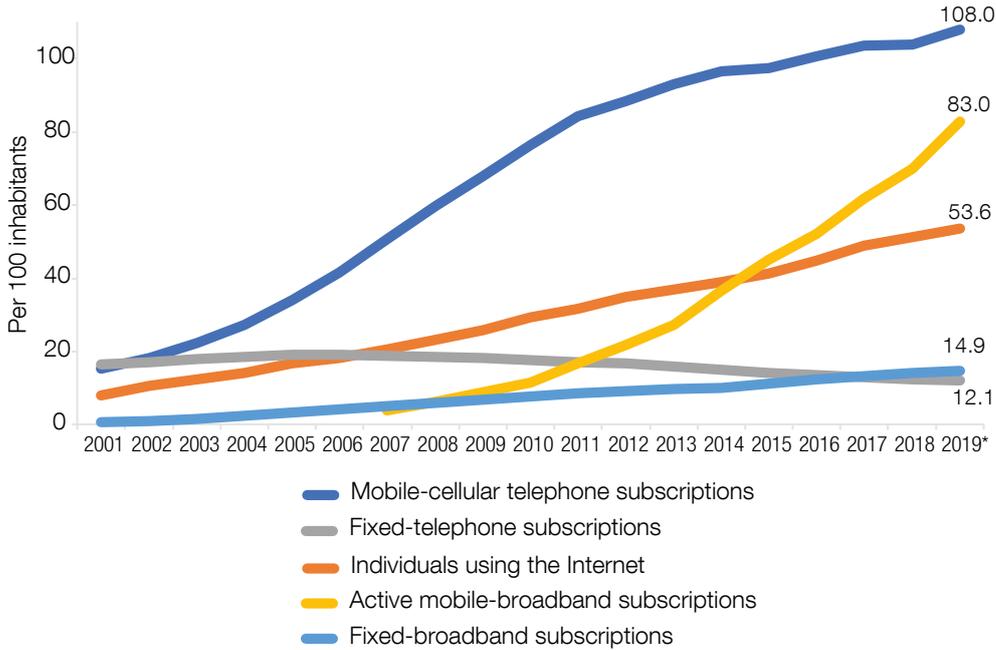
The period since WSIS has seen impressive growth in access to ICTs, particularly mobile cellular and mobile broadband networks, but there remain persistent digital divides between and within countries that constrain their value to many people. These divides represent the greatest single challenge inhibiting fulfilment of the WSIS vision.

The spread of ICTs, particularly mobile telephony has been more rapid than that of earlier generations of communication technology (Figure 1). The years since WSIS have seen rapid transition towards mobile networks and devices as the principal means of telecommunication, including Internet access, for many people. Mobile networks now extend to more than 95% of the world’s population, while mobile broadband networks, offering much better Internet connectivity, extend to around 80% – while the challenge of connecting more remote communities has led to renewed interest in alternative technologies and community networks.

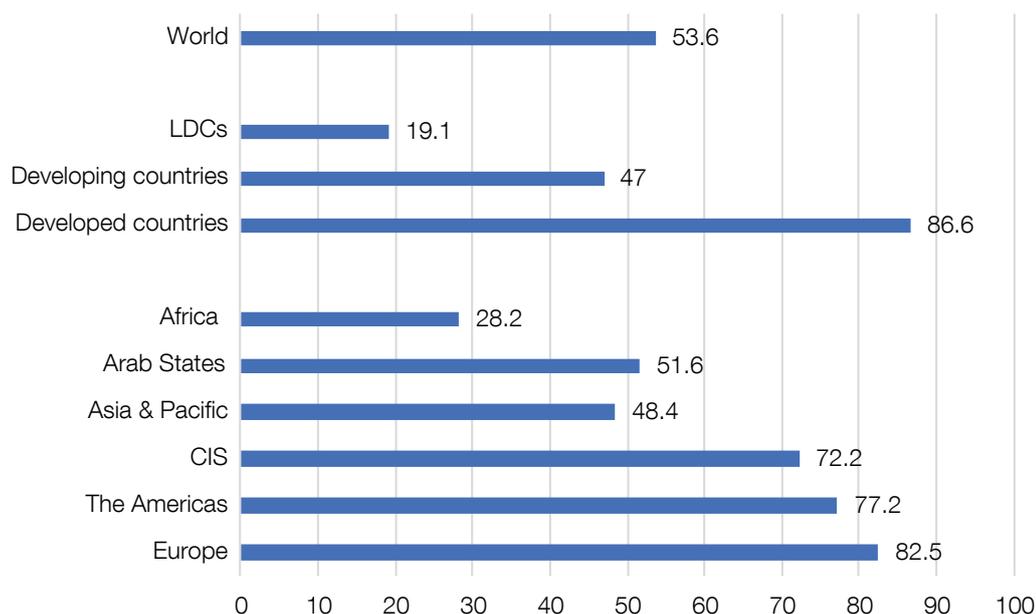
In the case of mobile telephony, the global rate of growth in access has decelerated since 2010 as mobile ownership has become close to ubiquitous for adults in many countries (though these data are affected by widespread dual ownership). The trajectory of access to the Internet has been less rapid but remained steady, reaching to over 53% in 2019.

These global trends, however, mask persistent differences in the experience of different regions, countries and population groups. Figure 2 show the extent of difference in internet usage in 2019 between the ITU’s geographic regions and between countries with different developmental

Figure 1 – Global ICT developments, 2001-2019



Note: \* Estimate  
Source: ITU<sup>7</sup>

**Figure 2 – Individuals using the Internet, 2019\***

Note: \* Estimate.

Abbreviation: CIS, Commonwealth of Independent States region

Source: ITU<sup>8</sup>

status. Those living in Least Developed Countries (LDCs) are much less likely than those in developed and more prosperous developing countries to have access to ICTs and the opportunities such access facilitates. The ‘universal and affordable access to the Internet’ called for in SDG9 is still far from being realised.

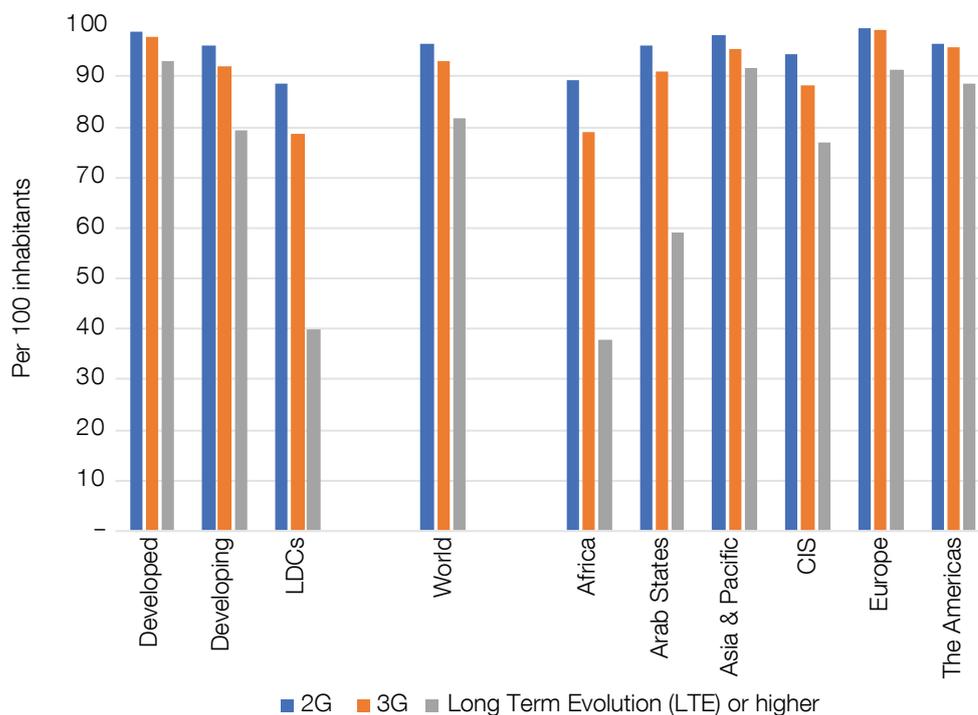
Distinct digital divides within countries underlie these differences between them. ICTs, like other development resources, cost money. More prosperous individuals and communities are more able to afford mobile phones and Internet access than those that are less prosperous. In some countries, the cost of effective Internet access exceeds 5% of average monthly income, and a much higher proportion of that of the poor. Lack of affordability is often compounded by poor literacy, lack of content in local languages and lack of skills to navigate and use online services effectively.

Inequalities in access to other resources that adversely affect marginalised groups are commonly replicated in access to ICTs, while inequalities in access to ICTs can exacerbate the disadvantages that such groups experience in accessing information and other services. Rather than reducing inequality, as had been hoped at WSIS, ICTs may currently be contributing towards it.

In its ten-year review of WSIS, UNGA expressed particular concern about the gender digital divide that has become apparent in many countries. Recent research for the GSM Association suggests that women in low- and middle-income countries are 10% less likely to own a mobile phone than men, with the widest gap apparent in south Asia.<sup>9</sup> Women are also likely to use fewer services. ITU believes this gap, which is associated with the same challenges of affordability, unequal literacy and digital skills, is growing because the number of men joining the Internet in developing countries is currently growing faster than that of women.<sup>10</sup>

Technologies of connectivity are constantly developing. New generations of mobile technology, with successively higher capabilities, have been deployed approximately every decade. At the time of WSIS, the third generation of GSM networks was displacing the second. Today, a fifth generation is starting to displace the fourth while a sixth is under discussion. The spread of upgrades such as these, is unequal: much more rapid in developed countries with high rates of connectivity than in most developing countries and particularly LDCs<sup>11</sup> (Figure 3). This technological disparity is reflected in other areas of digital capacity, such as the amount of international bandwidth available per person.

**Figure 3 – Mobile coverage by type of network, 2019\***



Note: \* Estimate.  
Source: ITU.<sup>12</sup>

Growth in access and connectivity since WSIS has, therefore, been rapid but remains unequal. Constant improvement in the capabilities of networks and devices means that those with lower incomes and more limited resources continue to lag behind those that are better resourced. The extent to which online activity pervades different societies therefore varies greatly, with significant consequences for its impact on economic activity and development.

## 4. The changing world of digital technology and services

The Information Society is in constant evolution. It is expected to transform many aspects of economy and society, governance and daily life, but, as we have learnt since WSIS, its development and impacts are unpredictable. The technology that underpins the Information Society is rapidly changing. Our expectations of it are also in flux.

For decades now, the capacity and speed of the networks and devices underpinning ICT services and applications have been doubling every two years or so. The IT resources that governments, businesses and citizens use today are immensely more capable than those that were available at the time of WSIS.

Technologies and services that existed then have expanded greatly, not just in terms of access but also in capabilities and the scale of usage. Alongside these, the period since WSIS has seen the emergence of a far wider range of new technologies and services. A first wave of these was discussed in the five-year report of WSIS outcomes prepared by the Commission on Science and Technology for Development (CSTD) in 2011, including the transition from narrowband to broadband networks, the growth of markets for mobile telephony and mobile Internet, and the emergence of social networks and cloud computing.<sup>13</sup> CSTD's ten-year review of WSIS in 2015 focused on a second wave of transforming innovations, including datafication and the growth of big data analysis, 'smart' systems and the Internet of Things (IoT).<sup>14</sup>

Today, we look ahead to a third wave of new technologies and services, whose transformative impact is likely to be greater still, including widespread automation across many sectors of the economy, in governance and daily life. Artificial intelligence, robotics and machine learning lie at the heart of this third wave, drawing on both the accelerating capabilities of digital devices and the accumulation of massive data sets derived from the digitalisation of human activity. These ‘frontier technologies’ are poised to characterise the pervasive Information Society of the future that is now emerging in developed countries, from the growing adoption of ‘virtual assistants’ and automated translation to the piloting of autonomous (‘self-driving’) cars.

While technology develops rapidly, and rapid impacts are anticipated, however, their deployment and impact are profoundly affected by the inequalities between regions, countries, communities and individuals already described. Like current technologies, these new technologies are likely to be adopted much more rapidly by those countries and individuals with money and resources to make use of them, which are both unequally distributed. Developed countries and high-income developing countries are therefore better placed to take advantage of the opportunities of new technology than the majority of developing countries and particularly LDCs; wealthier and more educated individuals better placed than those with low incomes or more limited educational experience. As a result, there is a risk that these advances in technology could further exacerbate existing developmental inequalities. This is a major challenge for the international community that requires action across the SDG agenda, not just within the information sector.

The following paragraphs address aspects of them through illustrative examples of digital devices, infrastructure, new services and new technologies, including the next generation of innovations on whose threshold we now stand.

### ***Changing digital devices: the mobile phone***

One example of change lies in the ‘mobile phone’. This received much less attention than the Internet in WSIS outcome documents but has become the principal device through which most users now access the Internet and online resources. Mobile telephony has graduated through several network

generations, each faster and more capable than its predecessors, while mobile devices have been transformed from telephones to multi-purpose miniature computers. For many people, ownership of mobile phones has had transformative impacts on interpersonal relationships and interactions with government, business, work and leisure. Mobile applications are their primary means of access to the Internet, their principal means of communicating with friends, colleagues and acquaintances (by text, messaging, video and telephone), and a way to shop and even meet their future life partners.

### ***Changing infrastructure: the cloud***

A second example of such change has been the emergence of ‘the cloud’. ‘Cloud computing’ and ‘cloud services’ have shifted the emphasis of IT use from individuals’ personal or workplace devices to digital interconnection. Instead of storing data on computer hard drives, for example, users now take advantage of data storage centres owned by major corporations and located around the world. Applications, including those driving e-commerce, are likewise run, by many users, from ‘the cloud’ rather than their own devices. Cloud-based services have reduced costs for governments, businesses and individuals and have particular potential to support start-ups and small enterprises, but business applications require reliable high-quality communications networks that are more widespread in developed than developing countries. The growth of the cloud has also raised new challenges concerning data privacy, data sovereignty and data ownership.

### ***Changing services: platforms and social networks***

Social networks – online platforms that enable users to publish or exchange content in wide user groups – were in their infancy at WSIS. The most prominent today, Facebook, was founded between the two sessions of the Summit; now it has over two billion subscribers, around half of current Internet users. Other mass market platforms – search engines such as Google, social networks and messaging services such as Weibo and Instagram, microblogging applications such as Twitter, content sharing sites such as YouTube and e-commerce sites like Amazon, eBay and Alibaba – are now major actors in the evolving digital ecosystem. For many users they have become primary sources not just of social contact but of news and other

information. These and other platform businesses have disrupted more traditional markets, such as those for newspapers and broadcasting, taxis, public transport and accommodation, as well as some types of employment where so-called 'gig economy' enterprises act as intermediaries between service providers and end users.

### ***Changing technologies: blockchain***

Uncertainty about the scalability and sustainability of technologies is inherent in rapid innovation and challenging for decision-makers in both government and business. One example here is blockchain, a distributed ledger technology, one of whose core features, security by design, has made it prominent in the development of cybercurrencies. Blockchain's champions believe it can become pervasive across many application areas, particularly where secure transactions are required, while critics doubt its impact will be as widespread or permanent. Implementations of blockchain have raised important questions at the intersection between digital technology and other areas of public policy. The very high electric power requirement associated with the cryptocurrency Bitcoin, for example, has alerted policymakers to the potential environmental impact of other innovations that rely on high-volume, energy-intensive sharing and analysis of data, including machine learning and autonomous vehicles.

### ***The next generation of technology: artificial intelligence and machine learning***

Many new technologies are now emerging that build on previous generations of computing and communications. The term 'artificial intelligence' (AI), rarely used at the time of WSIS, is now widely used to describe the automation of processes that have previously been done by people and the introduction of processes that were not possible before current levels of computing power became available. AI is increasingly deployed in manufacturing, often associated with robotics, is central to the leveraging of data which underpins the business models of online services and is beginning to be adopted in the home as AI-supported 'IoT' devices become more widely available. AI's capabilities are accelerated by machine learning, the conjunction of computing

algorithms with massive data sets in ways that enable AI platforms and applications continually to adapt and enhance the precision with which they fulfil their roles without direct human intervention.

Accelerating growth in the deployment and capacity of AI and machine learning offers tremendous opportunities for improvements in public services, for example in the allocation of resources and the early identification of diseases, and for the introduction of 'smart systems' to improve the management of complex environments challenges. Many are enthusiastic about their potential to transform urban environments into 'smart cities', the efficiency of whose infrastructure and services is digitally optimised. At the same time, the pace and uncertainty of AI development have raised concerns and anxieties in many people's minds concerning, for example, the displacement of traditional employment in manufacturing and services, the transfer of decisions that affect people's lives from human judgement to computer algorithms, the risk that machine learning will inherit and entrench discrimination in existing data sets derived from historic inequalities, and the challenge that pervasive data-gathering and leveraging may pose to privacy, including mass surveillance.

The rapid growth of AI and machine learning illustrates the growing challenges of governance in seeking to maximise the opportunities of new technology while minimising risks in a context whose development is and will remain difficult for all – technologists and businesses as well as governments – to predict.

## **5. Underlying trends in the Information Society**

The advance of technologies and services illustrated by these examples has been dramatic, yet in many ways they remain in their early stages of deployment and development. ICTs have had profound impacts across economy, society, culture and governance, particularly in developed countries, since WSIS, yet these impacts, too, are in their early stages and will become much more significant as technologies and services develop further, are more extensively deployed and used, and lead to adaptations by governments, businesses and citizens. Current and future impacts will include opportunities for governments to improve public services, businesses to improve

productivity, and citizens to enhance their lives, but will also include disruptive challenges to established and often cherished aspects of current societies – to laws and norms, to jobs and business models, to relationships between people, governments and businesses.

Trends that have become apparent in these areas since WSIS are likely to continue, at least in the short term, but will also be affected by new innovations and by the ways in which human societies, economies and institutions adapt to innovation. Understanding these trends is crucial to decision-making in government and business. The following paragraphs identify four trends that, alongside those in access and connectivity, are crucial to developing that understanding.

### *The underpinning role of data*

Digitalisation – the gathering, storage, management and exploitation of data – lies at the core of the Information Society that is now evolving. ICTs enable the automated gathering of data by default, and the volume of data that is gathered and stored as a result has risen extremely quickly. Global Internet traffic, a proxy for the volume of data flows, grew from about 100 gigabytes per day in 1992 to more than 45,000 gigabytes per second in 2017 and is projected to reach more than 150,000 per second by 2022.<sup>15</sup> This massive growth in data volumes, and the concurrent growth in computing power that enables ‘big data’ sets to be exploited in real time and in conjunction, underpins the development of AI and machine learning and of smart systems such as autonomous vehicles.

### *The changing ICT business environment*

Rapid changes in technology have been associated with rapid changes in the ICT business sector, many of which were not anticipated at the time of WSIS. Seven of the eight largest corporations worldwide today, by market capitalisation, are Internet and data management businesses. This market capitalisation is geographically consolidated, with some 90% of capital in platform businesses held by companies based in the United States and China, countries which are also responsible for 75% of the world market in cloud computing. These data management businesses originated, often as quite recent start-ups, in computing and in online services, and are now extending, through

both acquisitions and investment in research and development, into frontier technologies including artificial learning and quantum computing.

The success of a number of these firms has been built on online platforms, new business models that take advantage of characteristics and resources derived from networks that act as intermediaries between suppliers and customers of online content, services and transactions. Rather than charging users a subscription, platform business models leverage data derived from usage to maximise revenue from third party clients, particularly through targeted advertising. This business model tends towards market consolidation because scope and scale benefit online networks more than more traditional firms for two reasons: because more extensive networks are more valued by their users, and because the algorithms that underpin them become more accurate as more data becomes available from larger user groups. This poses a particular challenge to businesses in smaller and less developed countries that have relatively small domestic markets and so less opportunity to build scope and scale, as well as to those in traditional sectors whose business models are vulnerable to platform competition.

### *The pace and unpredictability of change*

The rapid, continuous and therefore apparently accelerating pace of growth which has occurred for decades in the capacity of capabilities of ICT networks and devices has been accompanied by and facilitated step changes in innovations (like the World Wide Web, invented thirty years ago, and machine learning today). Innovations in ICTs are leading now to what has been called a new or ‘fourth’ industrial revolution and a new or ‘second’ machine age.<sup>16</sup>

One of the most important lessons the international community has learnt since WSIS concerns the difficulty of predicting the adoption and impact of new technologies. Few at the time of WSIS anticipated the rapid growth in mobile broadband and mobile Internet, cloud computing or social networking, that has occurred since then. The impacts of these innovations on business development and human behaviour, and the new opportunities and challenges arising from them, have surprised governments and technologists alike. There is much greater awareness now of the potential risks as well as opportunities involved. Criminals, for

example, have proved at least as adept at taking advantage of those opportunities as governments and businesses, raising new challenges for law enforcement, consumer protection and human rights. What is more, the pace of technological change in some areas now exceeds the capacity of governments and citizens to plan how best to adapt, exploit opportunities, minimise risks and introduce appropriate governance mechanisms.

The changing technologies and services illustrated by examples above do not occur in isolation. Other high-technology sectors are also experiencing rapid change, including biomedicine and gene editing, nanotechnology and renewable energy. These interact with and make use of ICTs while also presenting their own new opportunities and challenges. This interaction amongst frontier technologies suggests that we must consider their impact holistically rather than independently.

### ***The relationship between ICTs and sustainable development***

Expectations of the benefits of ICTs were high at WSIS. It was widely hoped that they would provide new opportunities to deliver developmental gains by improving productivity and reducing costs for business, facilitating access to better public services such as education and health (for example through innovations such as online access to tuition and remote diagnosis), and enabling individuals to gain access to information they could use to improve their quality of life and livelihoods.

ICTs have indeed facilitated many developmental initiatives and play an increasingly important part in fostering developmental goals, as described at the WSIS Forum and in reports by UN agencies and other development actors. This has occurred not just through the implementation of planned ICT and ICT-enabled initiatives in specific sectors and locations, but more generally through the systemic adoption by governments and businesses, individuals and communities, for their own purposes, of mobile communications, the Internet and online services.

The extent to which ICTs have become pervasive has even begun to alter the dynamics of whole societies: where and how people live and shop, travel, work and play. This impact will grow, varying from place to place according to local circumstances but significantly altering the foundations for public policy.

Two factors here are especially significant. One, the different levels of access and connectivity in different countries and communities, has already been described. Inequalities in access present governments with different contexts which require different policy approaches as they seek to avoid inequalities in access leading to inequalities in impact.

The second factor concerns the enabling framework for digital development. The *Tunis Agenda for the Information Society* adopted the report of a Task Force on Financing Mechanisms which recommended a range of investment approaches for infrastructure and applications.<sup>17</sup> This encouraged regulatory strategies designed to attract investment, particularly into areas deemed marginally commercial, but recognised that developmental finance would also be required in some cases if ICTs were to be effectively deployed. The need for broader governance approaches to the ICT sector, establishing an enabling framework for innovation and the leveraging of ICTs' economic potential – 'analogue complements' to digital development, as the World Bank has called them – is now widely recognised.

The SDGs established a comprehensive framework, agreed by all, for addressing global developmental challenges in the period to 2030. The importance of enabling access and connectivity to ICTs was recognised explicitly in SDG9, but their significance in enabling delivery of all the SDGs is now manifest and growing. There is insufficient space here to discuss the range of development sectors in this context, so two – the digital economy and employment – must serve briefly to exemplify the opportunities and challenges.

#### ***a) The digital economy***

The digital economy is changing. At the time of WSIS, it consisted of the ICT sector itself and those relatively few businesses that were highly dependent on it. Now, UNCTAD identifies three main areas of activity within the digital economy: those concerned with hardware, software and infrastructure; those concerned with services, including platforms; and those in 'digitalising' sectors like finance, media and transport where digital products and e-commerce are increasingly important. In practice, though, the digital economy is increasingly integral to economic activity in general. Global e-commerce has been growing rapidly in recent years, with global sales reaching an

estimated US\$ 29 trillion and a quarter of the world's population now sometimes shopping online.<sup>18</sup>

Participation in the digital economy does not guarantee success. Effective engagement requires reliable connectivity and appropriate legal and regulatory frameworks for digital transactions, data protection, consumer rights, taxation and trade facilitation. These are still lacking in many developing countries. Businesses need to restructure in order to exploit resources such as cloud computing and integrate into new supply chains, particularly at an international level. Meanwhile, markets such as business process outsourcing, which have proved sources of revenue and employment in some developing countries, are becoming vulnerable to automation through AI.

Countries that lack sufficient infrastructure or fail to adapt their legislative and regulatory frameworks, and businesses which fail to restructure, are likely to become less competitive in international and more vulnerable in domestic markets. UNCTAD's 2019 *Digital Economy Report* emphasises the importance for developing countries, in this context, of focusing on value creation and building on local strengths. Their greatest potential, it suggests, may lie in digital products that are hard for global businesses to replicate, are needed locally, and can be developed and deployed at relatively low cost. This approach will require the adaptation of national policies and legislation, with an emphasis on skills and enterprise development.<sup>19</sup>

#### ***b) Employment and skills***

Employment is a crucial foundation for financial security and personal fulfilment in most people's lives. ICTs are changing the nature of employment in many areas, displacing jobs in some sectors and creating them in others.

In the early years of this century, the impact of automation was mostly felt in manufacturing and manual employment. More recently, online businesses have disrupted traditional service sectors. Platforms such as Uber and Lyft in the transport sector, Airbnb in hospitality, and Freelancer and Amazon Mechanical Turk in business services, connect clients requiring short-term services with freelance workers willing to supply them, thereby displacing or reducing demand for supply from businesses with full-time employees. Typically, these 'gig economy' platforms regard themselves as intermediaries rather than employers. While offering more flexible working arrangements, those

who contract with them do not benefit from the workplace benefits associated with employment contracts. As employment rights vary between countries, so does the impact of this change in labour markets.

There is great uncertainty about the potential impact of AI and other digital innovations on the long-term labour market. Some argue that the lower cost and higher productivity achievable through AI and machine learning will lead to very substantial job losses – in manufacturing and other areas of physical labour through robotics, in transport through autonomous vehicles, and in service sectors, including graduate sectors such as law and medicine, through the displacement of learnt information and analytical skills by algorithms and databases. Others believe that these effects will be less significant or that new forms of employment will emerge either within the digital sector or in those that require skills that cannot easily be replicated digitally, such as care and creativity.

As well as being difficult to predict in general, these outcomes will vary according to factors such as the composition of national economies, the relative cost of labour and capital in different countries, and the reliability of network infrastructure on which AI depends. It is generally agreed, however, that more investment will be needed in skills development for the digital age, including new digital and non-digital skills, and that individuals will need to learn and adapt to changing employment opportunities throughout their working lives. Some policymakers have been considering structural changes in employment, such as shorter working weeks, and in remuneration, such as universal basic income.

## **6. Governance and human rights**

The growing prevalence of digital technologies has led to changes in the relationships amongst governments, businesses and citizens, and new challenges of governance.

Many governments have invested in the provision of online public services, enabling information and, often, official transactions, to take place online with the aim of improving access for citizens and efficiency in revenue and resource allocation. Big data analysis has enabled a more comprehensive understanding to emerge of complex economic

and social needs which can be addressed through more effective targeting and automated decision-making, such as smart systems to manage urban traffic flows in real time. The rapid development of machine learning will accelerate these trends.

Increased opportunities to access information and express themselves online have enabled citizens in many countries to play a greater part in decision-making processes that affect their lives and livelihoods. New information channels such as social media have complemented and challenged traditional media, supplementing established means of news gathering and dissemination, and making these more open to a wider range of contributors, but have also raised questions regarding the quality and reliability of information.

## Digital governance

The future of Internet governance was a major theme during the second phase of WSIS. The *Tunis Agenda* adopted a working definition of Internet governance and recognised the roles within it of different stakeholder communities, including the loosely-coordinated multistakeholder associations that had played leading roles in its development to date.<sup>20</sup> It invited the Secretary-General to initiate two processes to foster consensus around future governance arrangements.

The IGF has been held annually since 2006. It provides an open discussion space for stakeholders to explore all aspects of the Internet and its intersection with other areas of public policy and has become a valued and important part of the Internet governance ecosystem. In 2019 it was attended by over 3600 delegates from over 160 countries, from governments, the private sector, civil society and the Internet's technical community, who participated in some 200 separate sessions.<sup>21</sup> A review of the IGF's performance in 2012 identified a number of potential improvements which its Multistakeholder Advisory Group has subsequently sought to implement. The General Assembly agreed in 2015 to extend the mandate of the IGF until 2025. A second process that was initiated following WSIS, to establish 'enhanced cooperation ... to enable governments, on an equal footing, to carry out their roles and responsibilities in international public policy processes pertaining to the Internet,' has so far achieved more limited results.

The digital governance ecosystem has, meanwhile, become much more complex as technology has evolved and become pervasive across aspects of national and international discourse. A study undertaken in 2019 identified more than a thousand international fora concerned with digital cooperation at an international level.<sup>22</sup> This proliferation makes it difficult for all stakeholders, particularly the governments of smaller and developing countries, businesses outside the major global corporations and civil society organisations, to participate effectively in decision-making that could have profound implications for their futures.

One of the most significant governance impacts of WSIS was the importance it attached to multistakeholder engagement, involving diverse non-governmental communities – business, civil society and the technical community with expertise in Internet and other digital technologies – alongside governments and international organisations in discourse about the Information Society's development. That model of multistakeholder participation, which drew on established Internet arrangements and is reflected in both the WSIS Forum and the IGF, was reinforced by the General Assembly in 2015 and has become the norm more widely in fora concerned with digital governance. The interface between multilateral and multistakeholder arrangements is increasingly important as ICTs exert more influence on other areas of economy, society and governance.

Future digital governance also needs to be multisectoral and multidisciplinary, drawing on wider expertise in areas of development, environment and public policy that are impacted by the Information Society as well as on ICT-related expertise.

Many issues in digital governance transcend national and international boundaries. The transnational character of leading data corporations, and the non-physical character of online services and transactions, raise complex issues concerned with data ownership and jurisdiction, taxation and regulation. Different legal frameworks governing content, criminality and privacy and data protection have created opportunities for individuals and organisations to bypass national jurisdictions in ways and for purposes that may be benign or harmful. Governments and businesses have faced threats to the integrity of their digital systems, including distributed denial of service attacks, originating from sources outside their territory.

Some have alleged foreign interference, using the Internet and social media, in elections and other political processes.

Cybersecurity has become a major priority for governments, businesses and citizens around the world. Lack of confidence in the security and trustworthiness of online services is a significant barrier to Internet use by many people, reducing the potential developmental value of online services and resources. It is widely recognised that issues of cybersecurity require global cooperation if they are to be addressed effectively, involving governments, ICT businesses, technologists and civil society organisations.

The Information Society that has emerged since WSIS was described as the ‘age of digital interdependence’ by the UN High-Level Panel on Digital Cooperation which reported in 2019.<sup>23</sup> It recommended the initiation of discussions that might lead to two Global Commitments, one for ‘Digital Cooperation’ itself, enshrining goals, principles, and priority actions, to mark the 75<sup>th</sup> anniversary of the UN’s foundation; the other, on ‘Digital Trust and Security’, ‘to shape a shared vision, identify attributes of digital stability, elucidate and strengthen the implementation of norms for responsible uses of technology, and propose priorities for action.’ The Panel also proposed three models for future digital cooperation, based on experience in existing Internet and global governance structures, on which further discussion will take place during the coming year.

### ***Human rights and ethics***

The vision of an Information Society set out in the *WSIS Declaration of Principles* affirmed that it should fully respect and uphold the Universal Declaration of Human Rights (UDHR), with particular reference to Article 19, which is concerned with freedom of expression, and Article 29, which is concerned with the exercise of rights and freedoms.<sup>24</sup> The UN Human Rights Council clarified in 2012 that ‘the same rights that people have offline must also be protected online.’ This was reaffirmed in the General Assembly’s ten-year review of WSIS.

The characteristics of today’s ICTs have altered the parameters within which some rights within the UDHR and other international rights agreements are enabled, enforced and exercised, including economic, social and cultural as well as civil and political rights. New opportunities and challenges

have emerged particularly in two areas, those concerned with expression and privacy.

The WSIS outcome documents recognised the power of the Internet to enhance access to information and increase opportunities for expression, particularly for those whose voices have been historically marginalised in public policy debates, including women. Many innovations since WSIS have facilitated access to information and expression, including greater provision by governments of public information and services and widespread participation by users in social networks and other new platforms for self-expression. Traditional media outlets have been supplemented by opportunities for organisations and individuals, as well as media professionals, to publish content online through blogs, vlogs and microblogs, on social media and websites. YouTube alone publishes an additional 500 hours of video content each minute, with five billion videos watched on that platform every day. Some YouTube channels have more than 20 million subscribers.<sup>25</sup> The opportunities provided by these platforms have not yet, however, reached everyone, particularly in lower-income groups and LDCs.

This burgeoning of online content has raised new challenges concerning freedom of expression and the governance of harmful content. Some content (for example, child sex abuse images and incitement to genocide) is illegal in most or all jurisdictions. Governments, online businesses and civil society organisations have sought, with varying degrees of success, to address other forms of malicious content, such as hate speech, bullying, sexual abuse and attempted fraud, through mechanisms such as codes of conduct as well as legislation. There has been growing concern over the spread of misinformation and disinformation and perceived polarisation of public opinion online. This has been attributed by some observers, in part, to algorithms that direct users towards content that matches previous choices and so reinforces existing perspectives.

Privacy rights and data protection have also drawn increased attention, which is likely to grow as datafication, AI and algorithmic decision-making reach further into the management of societies and lives of individuals. Personal data and metadata, including data on personal behaviour, are now gathered by default through online activity rather than having to be sought directly from individuals. The scope and volume of personal data gathered

in this way are expanding rapidly as more individuals acquire IoT and AI-enabled devices and as businesses and law enforcement agencies monitor online and offline activity through remote monitoring technologies, including biometrics. The business models of online corporations rely on the exploitation of such data to target advertising and maximise revenue, while both governments and businesses are beginning to deploy algorithms that can make life-changing decisions based on the combination of multiple data sets. The globalisation of data management means that these data sets are not usually held in national jurisdictions.

The next generation of digital technologies, including artificial intelligence and machine learning, will greatly increase the scope, scale and exploitation of personal data. Many of the resulting applications will be beneficial, such as improved medical diagnostics, better traffic management and improved allocation of public resources. Others may not be so benign, and these developments have therefore led to growing concern in many societies. Some jurisdictions have introduced more comprehensive data protection frameworks to restrict the exploitation of data sets without consent, such as the European Union's General Data Protection Regulation (GDPR), but many developing countries still lack adequate legislation concerning the exploitation of personal data and its protection from unauthorised distribution and use. A substantial number of organisations have also sought to develop ethical frameworks for artificial intelligence, involving different approaches including both government regulation and self-regulation by online businesses.

## 7. The Information Society of tomorrow: priorities for the 2025 review

The Information Society is rapidly evolving. Its opportunities and challenges are multiplying, affecting every aspect of economy, society and culture, and its impacts are accelerating. No national policy agenda and no area of international discourse is now immune from it and from the transformative changes it is poised to bring about. It has become pervasive and fundamental to the international community's efforts to implement the SDGs, including in international efforts to combat climate change and to promote peace and

security. The Information Society can no longer be considered in isolation, but must be considered as a crucial element within an integrated approach to human development.

The General Assembly agreed in 2015, in its ten-year review of WSIS outcomes, to undertake a further review after twenty years, in 2025. This report has surveyed the scene halfway between these dates, illustrating the dynamic changes which have taken place and continue to shape the Information Society. It is clear from this survey that, if the 2025 review is to provide guidance to the international community that meets humanity's future needs, it must do more than look back at what has been achieved (and not achieved) since the Summit ended in 2005. To be of value, it must address the much more complex and dynamic Information Society that will exist at the time of the review itself, the trends which are apparent then, and the impacts which ICTs and other frontier technologies are likely to have on economy, society and culture in the future.

This suggests that the review will have two lenses. One lens will focus on the dynamic processes of change in the Information Society that have taken place since WSIS in technology, in the deployment of ICTs, and in impacts on development, environment, rights, human behaviour and other critical areas of international governance. In doing so, it will need to pay close attention to the intensity and implications of digital divides.

A second lens, however, should consider how ongoing trends and likely new developments will affect progress towards human development in future, including the SDGs to whose more comprehensive review process this WSIS review should, UNGA agreed, act as an input. This lens will focus on the vision which was set out in the agreements reached in Geneva in 2003 and Tunis in 2005 and reaffirmed by the General Assembly in 2015. The WSIS vision looks to a 'people-centred, inclusive and development-oriented Information Society,' committed to development, human rights and fundamental freedoms, built on the desire to turn digital divides into digital opportunities that are available to all. The most important question for the review will concern how this vision can be best advanced in the Information Society that pertains in 2025 and will evolve into the future.

A forward-looking approach along these lines will complement the *2030 Agenda for Sustainable Development* which seeks to implement the vision

of sustainable development that first emerged at the UN Conference on Environment and Development (the Earth Summit) in 1992. It will be a complex and difficult challenge, requiring evidence, foresight analysis and engagement from all stakeholders. The following paragraphs briefly consider these priorities.

## Evidence

Although data lie at the heart of the Information Society, the indicators available for policy analysis are often poor, even where access and connectivity are concerned. National statistical systems in many developing countries are relatively weak. Data rapidly fall out-of-date in contexts which change quickly like the Information Society. The vast majority of data derived from digital behaviour, which would help identify impacts, are held by corporations, not by governments.

The *Tunis Agenda* identified several ways of monitoring the Information Society. Ten targets, mostly concerned with connectivity, were established with a target date in 2015, and reported in the *Final WSIS Targets Review* published that year.<sup>26</sup> The multi-agency Partnership on Measuring ICTs for Development has drawn up a series of indicators, including, recently, several aimed at measuring ICTs' contribution to the SDGs.<sup>27</sup> Multistakeholder 'Action Lines' have looked annually at developments in different areas of the ICT-development agenda. CSTD has published two book-length assessments of WSIS outcomes,<sup>28</sup> while other agencies have established indices concerned with more specific outcomes, such as e-government and the digital economy.<sup>29</sup> UNESCO has recently published a framework of quantitative and qualitative indicators to assess national 'Internet Universality', focused on rights, openness, access and multistakeholder participation as well as gender, children's rights, trust and security, legal and ethical frameworks.<sup>30</sup>

These assessments are important but more information, both quantitative and qualitative, will be needed to guide national and international policy as the Information Society gathers pace. Decision-makers in government and business need accurate and timely information not just about overall levels and trends in ICT access, use and impact, but disaggregated data about the different experiences of women and men, young and old, rich and poor, those living in rural areas and in cities, those living with disabilities, those who are marginalised. They

need data, too, on the impact of the Information Society on other areas of economy, society and culture, in order to address the needs of different groups within society, improve public services, maximise the benefits and minimise the risks arising from digitalisation. Many of these impacts are and have been unintended and unexpected. Understanding these unpredicted outcomes is as important as understanding what was planned.

## Foresight analysis

A second priority for the review will be to consider likely future developments in technology and the impacts which these may have on different economies and societies. Foresight analysis is challenging in all contexts and particularly so in something so fast-moving as the Information Society.

The pace of change, however, makes it all the more important. Technological change today can be so rapid that it has impacts on society, including impacts that are irreversible, before governments and other stakeholders can put in place legal and regulatory frameworks to shape them in the public interest. Many of these impacts will be beneficial but may not benefit all countries or communities. Some will be detrimental. Achieving the WSIS vision of a people-centred, inclusive and development-oriented Information Society requires attention by policymakers and other stakeholders to critical dimensions of human development that lie outside the ICT sector, including sustainable development, climate change and the impact of innovation on equality, including gender equality. Independent foresight analysis, which is concerned with assessing likely impacts of new technology into the future, can be extremely valuable in enabling this. It will need to consider differences between countries and communities as well as general opportunities and threats.

## Engagement

The third priority for the review is to secure widespread engagement, including UN and other multilateral agencies, national governments, the private sector, civil society, the technical communities concerned with the development of ICTs, digital development and development more generally.

It will be important to draw views – about progress since WSIS and the future direction of

the Information Society – from governments and stakeholders in countries with diverse development status and characteristics. It will be important to understand hopes and anxieties, views and aspirations not just of broad stakeholder groups but of the diverse communities and organisations within them – for example, from government departments concerned with developmental goals as well as ICTs, from small businesses and businesses that make use of ICTs as well as those that supply digital goods and services, from women and men, young and old, poor and rich. It will be as important to learn from those whose expertise lies in policy domains that are affected by development – in sectors such as health, education and agriculture, and in policy areas such as environment and rights – as from those whose expertise lies in technology itself.

These three priorities require time. Although the conclusion of the General Assembly's review is still five years away, the mechanisms required for it need to be put in place well beforehand. Planning for this, involving UN agencies and other stakeholders, should now be getting underway.

## **Conclusion**

The United Nations has a crucial role in monitoring the development of the Information Society, supporting governments and other stakeholders in their efforts to maximise its benefits for sustainable development and minimise the risks posed by the use and misuse of ICTs, and integrating the WSIS vision of a people-centred, inclusive and development-oriented Information Society into the Sustainable Development Agenda. All UN agencies have a part to play in this, alongside other international agencies, governments, businesses and other stakeholders. The 20-year review of WSIS in 2025 will provide an opportunity to take stock of what has been achieved since 2005, and to build stronger cooperation between governments and amongst stakeholders in order to ensure that the Information Society continues to contribute strongly to human development in which no country and no-one is left behind.

## Endnotes

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- <sup>16</sup> See e.g. Brynjolfsson and McAfee, *The Second Machine Age*, <http://secondmachineage.com/>
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- <sup>20</sup> <https://www.itu.int/net/wsis/docs2/tunis/off/6rev1.html>, para. 34.
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