

International Telecommunications Union (ITU)

1. Background

ITU is the United Nations specialized agency for information and communication technologies – ICTs. ITU is committed to connecting all the world's people – wherever they live and whatever their means. Through our work, we protect and support everyone's fundamental right to communicate.

ITU allocates global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide.

An organization based on public-private partnership since its inception, ITU currently has a membership of 193 countries and almost 800 private-sector entities and academic institutions.

ITU membership represents a cross-section of the global ICT sector, from the world's largest manufacturers and telecoms carriers to small, innovative players working with new and emerging technologies, along with leading R&D institutions and academia.

ITU has three main areas of activity organized in 'Sectors'.

RADIOCOMMUNICATIONS

Satellites enable phone calls, television programmes, satellite navigation and online maps. **Space services** are vital in monitoring and transmitting changes in such data as ocean temperature, vegetation patterns and greenhouse gases – helping us predict famines, the path of a hurricane, or how the global climate is changing. The explosive growth of **wireless communications**, particularly to provide broadband services, demonstrates the need for global solutions to address the need for additional radio spectrum allocations and harmonized standards to improve interoperability. ITU's **Radiocommunication Sector (ITU-R)** coordinates this vast and growing range of radiocommunication services, as well as the international management of the radio-frequency spectrum and satellite orbits. An increasing number of players need to make use of these limited resources, and participating in ITU-R conferences and study group activities – where important work is done on mobile broadband communications and broadcasting technologies such as Ultra HDTV and 3D TV – is becoming an ever-higher priority for both governments and industry players.

STANDARDIZATION

ITU standards (called Recommendations) are fundamental to the operation of today's ICT networks. Without ITU standards you couldn't make a **telephone** call or surf the **Internet**. For Internet access, transport protocols, voice and video compression, home networking, and myriad other aspects of ICTs, hundreds of ITU standards allow systems to work – locally and globally. For instance, the Emmy award-winning standard ITU-T H.264 is now one of the most popular standards for video compression. In a typical year, ITU will produce or revise upwards of 150 standards covering everything from core network functionality to next-generation services such as IPTV.

DEVELOPMENT

ITU's **Telecommunication Development Sector (ITU-D)** 's key objectives are: to foster international cooperation on telecommunication and ICT development issues; To foster an enabling environment for ICT development and foster the development of telecommunication and ICT networks; To enhance confidence and security in the use of telecommunication and ICTs; To build human and institutional capacity, provide data and statistics, promote digital inclusion and provide concentrated assistance to countries in special need; To enhance environmental protection, climate change adaptation and mitigation and disaster-management efforts through telecommunication and ICTs. ITU-D is required to discharge the Union's dual responsibility as a United Nations specialized agency and executing agency for implementing projects under the United Nations development system or other funding arrangements, so as to facilitate and enhance telecommunication/ICT development by offering, organizing and coordinating technical cooperation and assistance activities.

Section 2 provides a background of ITU's role in the WSIS process and its followup. Sections 3-8 provide some examples of ITU's efforts in areas, including frontier technology areas, that the High Level Panel of Digital Cooperation is focusing on.

2. ITU and WSIS

ITU organized the two phases of the World Summit on the Information Society (WSIS), in Geneva in 2003 and in Tunis in 2005, on behalf of and with the full participation of the entire UN system.

The conference was fully multistakeholder with 19000 stakeholders from all groups – governments, private sector, civil society, academia, international organizations all in the room. This was the first multistakeholder global conference on cyberspace.

The 2005 WSIS outcome documents, endorsed by Heads of States and world leaders, lay down the fundamental principles for cooperation in the information society.

Forums such as the IGF (on the governance policy aspects of cyberspace), WSIS Forum (on the developmental aspects) have emerged from WSIS.

In line with its mandate and the WSIS outcome documents, the ITU continues to play a key role in the WSIS implementation and follow-up process in particular, as the WSIS Action Lines Sole Facilitator for AL C2 (Information and Communication Infrastructure), AL C5 (Building Confidence and Security in the Use of ICTs), and AL C6 (Enabling Environment) and as a co-facilitator for various other action lines.

WSIS Forum

The annual World Summit on the Information Society (WSIS) Forum is a global multi-stakeholder platform facilitating the implementation of the WSIS Action Lines for advancing sustainable development. The Forum is co-organized by ITU, UNESCO, UNDP and UNCTAD, in close collaboration with all WSIS Action Line co-/facilitators and other UN organizations (UNDESA, FAO, UNEP, WHO, UN Women, WIPO, WFP, ILO, WMO, ITC, UPU, UNODC, UNICEF, UNIDO, UNITAR, UNHCR and UN Regional Commissions). It provides an opportunity for information exchange, knowledge creation and sharing of best practices, while identifying emerging trends and fostering partnerships, taking into account the evolving Information and Knowledge Societies.

In follow up to the outcomes of the UN General Assembly Overall Review of the Implementation of WSIS Outcomes ([Res. A/70/125](#)) and with the adoption of the 2030 Agenda for Sustainable Development ([Res. A/70/1](#)), the WSIS Forum is constantly evolving and strengthening the alignment between the WSIS Action Lines and the Sustainable Development Goals. The WSIS Forum therefore serves as a key forum for discussing the role of ICTs as a means of implementation of the Sustainable Development Goals and targets, with due regard to the global mechanism for follow-up and review of the implementation of the 2030 Agenda for Sustainable Development.

2019 marks the 10th anniversary of the WSIS Forum. ITU, along with the UNESCO, UNCTAD, and UNDP and with the support of 32 UN Agencies, will organize the WSIS Forum 2019 from 8 to 12 April in Geneva, Switzerland. In line with the Follow-up and review of the 2030 Agenda and Sustainable Development Goals, the main theme of this year is "Information and Communication Technologies for achieving the Sustainable Development Goals". This year, WSIS Forum is expected to welcome over 3000+ physical participants from more than 150 countries, 100+ Ministers and Deputies, 350+ workshops and sessions, and 18 WSIS Prize Winners. Different innovative special tracks have been planned such as e.g. Hackathon (Hacking Solutions for Lifelong Learning and Livelihoods), Extended Reality for SDGs, WSIS Accessibility Day, Youth Track, Frontier Technologies (such as Artificial Intelligence, Robotics, 3D printing, and the Internet of Things amongst others) and many others.

3. Inclusive Digital Development

Under its role as the United Nations specialized agency for ICTs, ITU is:

- Acting as a convening platform, where solutions on various topics related to digital cooperation topics are being discussed;
- Forming partnership to advocate on the importance of those issues –e.g. the Broadband Commission for Sustainable Development, or the Equals Global Partnership to bridge the digital divide;
- Executing projects contributing to all the above issues, mainly through the ITU Development Sector (ITU-D).

ITU, with its unique composition of membership, including apart from Member States –the private sector (ITU Sector Members) and Academia, is very well placed to contribute into identifying and promoting solutions in addressing the issues on inclusive development and capacity building

There have been several very successful examples of cooperation between stakeholder groups. E.g.

- ***EQUALS** is a global partnership of corporate leaders, governments, non-profit organizations, communities and individuals around the world working together to bridge the digital gender divide – by bringing women to tech, and tech to women – and in so doing, bettering the lives of millions worldwide.*
- *The **Broadband Commission for Sustainable Development** showcases and documents the power of ICT and broadband-based technologies for sustainable development. It brings together a high-powered community, including top CEO and industry leaders, senior policy-makers and government representatives, international agencies, academia and organizations concerned with development. Leaders in their field, they each believe strongly in a future based on broadband and offer rich insights and experience in how to deploy and use broadband networks and services to the benefit of communities and end-users. The Commission embraces a range of different perspectives in a multi-stakeholder approach to promoting the roll-out of broadband, as well as providing a fresh approach to UN and business engagement. The Broadband Commission engages in high-level advocacy to promote broadband in developing countries and underserved communities. One of the central roles of the Commission is to advocate for higher priority to be given to the development of broadband infrastructure and services, to ensure that the benefits of this technology is realized in all countries. Governments and industry need to work together, hand-in-hand, to devise strategies for driving the roll-out of these networks much more proactively.*

(Note: the Equals Partnership and Broadband Commission have submitted separate inputs to the open consultation)

Key elements of success and enablers for the cooperation:

- Identification of the **strategic vision and goals for the partnership** (e.g. Broadband Commission targets);
- **Representation** of all stakeholder groups (ranging from private sector to governments, from civil society to academia);
- **Neutrality, openness and transparency** from the ITU in serving as a platform.

Main challenges in achieving the goals of inclusive digital development:

- Unavailability or lack of digital infrastructure
- Affordability of access
- Relevance of content / availability of content in local languages
- Lack of digital skills

In ITU's opinion new types of partnerships (cross-sectoral, including all stakeholders) should be strengthened, as digital transformation is not only about the ICT industry, but all sectors/industries can benefit from the use of the digital technologies and transform.

All stakeholders have a critical role to play. Industry to foster innovation and invest in solutions; governments to create the enabling environments; and civil society to promote solutions that have significant impact to the final beneficiaries.”

4. Human Capacity Building Work

ITU works with its members, stakeholders and partners to shape the human capacity building agenda and determine priorities, as well as respond to the demand for digital skills development. This is achieved through generation of training content and curricula in specialized ICT topics, delivery of training and professional development courses, as well as managing knowledge transfer. Through the ITU Academy platform, ITU provides integrated digital skills development activities and trainings that cover a wide range of ICT topics from programmes for government policy makers and regulators, professional business focused curricula for senior ICT executives to specialized programmes for technical and operational staff.

a) Training development and delivery

ITU offers general and specialized courses on all aspects of information and communication technologies. ITU is partnering with various training providers to deliver about 100 training activities per year. These trainings are advertised in the ITU Academy platform, through an [online training catalogue](#). Training delivery partners include Centres of Excellence (CoEs), academic institutions and the private sector.

The [Centres of Excellence \(CoE\)](#) initiative evolved over the years to become one of the ITU's key training delivery mechanisms. With the support from multilateral and regional organizations, CoE networks have been established in a number of regions including Africa, the Americas, Arab States, Asia-Pacific, Commonwealth of Independent States (CIS) and Europe. Under the umbrella of the ITU Academy, these regional networks are brought together into a single global network sharing expertise, resources and capacity-building know-how in telecommunications and ICT training/education. Institutions are selected to operate as ITU CoEs for a four-year period, synchronized with the WTDC cycle. The second cycle of the new Centre of Excellence programme starts in January 2019 and ends in December 2022. A total of 31 institutions have been selected to operate as Centres of Excellence during this period.

ITU designs and develops standardized training programmes and resources corresponding to ITU's main areas of activity. Materials are developed and peer reviewed by experts from ITU, academic scholars and other experts, to ensure they meet the highest levels of quality and conform to ITU standards. In addition, materials are designed in such a way that training providers other than ITU can be involved in the delivery.

Training programmes developed under the ITU Academy include the [Spectrum Management Training Programme](#), [Quality of Service Training Programme](#) and [ICT and Climate Change Training Programme](#).

b) ITU Academy platform

[ITU Academy](#) platform is available to ITU members and partners to deliver ICT related training. The platform utilizes a Learning Management System (LMS) and a Content Management System (CMS) to facilitate an enhanced learning environment which allows for different modes of training delivery including instructor led and self-paced online delivery, networking, collaboration, and automated training assessment. In 2018 ITU launched self-paced online learning courses developed using authoring tools that facilitate access of the courses to the widest possible audiences, including people with disabilities.

c) Internet Governance

At the ITU World Telecommunication Development Conference (WTDC) 2014, ITU Member States agreed that capacity building of the ITU membership in Internet governance is one of the priority issues to be addressed by ITU's capacity building programme, with a focus on developing and least developed countries. This mandate was reinforced at WTDC 2017. ITU's activities in developing skills and capacities in Internet Governance (IG) are driven by a multistakeholder approach. ITU works in close collaboration with a variety of partners from academic Institutions, regional and international organizations, public and private sector training entities and civil society institutions. ITU also contributes to IG capacity building events such as Internet Governance Forum (IGF) 2018 in partnership with ICANN and Diplo Foundation. ITU activities on capacity development in Internet Governance can be found [here](#).

d) Knowledge exchange and strategic dialogues

ITU convenes global symposia and regional forums to facilitate knowledge exchange and global policy discussions relating to human capacity development in ICTs.

The [Global ICT Capacity Building Symposium \(CBS\)](#) was held from the 18-20 June, 2018 in Santo Domingo under the theme “Developing Skills for the Digital Economy and Society”. The Symposium attracted around 331 participants from 36 countries, public and private organizations, universities and research institutions, and other regional and international organizations. The discussions at the symposium included topics such as “integrating ICTs into cross sectoral policies to accelerate the achievement of the SDGs”, “leveraging partnerships for capacity building in the digital era” and “the new digital ecosystem and its transformative impact on lives and livelihoods”. Participants agreed that the digital skills gap is widening and needs to be addressed urgently to ensure full participation of all countries in the emerging digital economy and to avoid widening of the digital divide. The symposium also contributes to strengthening collaboration between ITU, the public and private sectors, business and the academic communities in developing capacities for the digital future. The CBS is held biennially and in between, an event is held for the role of academic institutions in capacity building. The last ITU-Academia Partnership meeting was held in 2017 and the details are available [here](#).

The [ITU annual Africa regional human capacity building workshop](#) was held in Abuja, Nigeria from 27-29 August 2018, under the theme “Strengthening capacities in Internet Governance in Africa”, in partnership with DIPLO foundation. This workshop is the second in a series of regional Internet Governance capacity development events that ITU is organizing in collaboration with other stakeholders. The workshop attracted more than 100 participants. The experience from these workshops will feed into the further development of ITU’s capacity development and training programmes in the field of Internet Governance, which are offered under the umbrella of the ITU Academy. The participants appreciated the multistakeholder approach of the workshop as it reflects the nature of Internet Governance policy making.

To enhance the contribution of the ITU member states in the ITU capacity development programme, ITU has set up a Group on Capacity Building Initiatives (GCBI) through [Resolution 40 of WTDC](#). The group is composed of two capacity-development experts from each of the six regions, who are familiar with the needs of their regions. However, participation in the work of the group is open to all interested Member States, Sector Members and Academia members. ITU convenes a meeting of the group once a year. The sixth meeting of the GCBI was held in Geneva from the 27-28 February 2018 where the group discussed the outcomes of WTDC-17, review of the Centres of Excellence first cycle, preparations for Global ICT Capacity building symposium and provided guidance on various capacity building issues. The meeting formed the basis for the group’s report to TDAG.

ITU releases an online publication on Capacity Building in a Changing ICT Environment annually. The publication puts together scholarly articles with a focus on capacity building and skills development in the digital era. It covers a wide range of topics related to the ongoing discussions on how digital technologies are transforming job markets, determining new skills sets requirements and driving the digital economy requirements for re-skilling. The [second issue](#) of the publication was presented at CBS 2018. It features articles that highlight different levels of skills required, from basic digital skills that are aimed at raising ICT awareness and enabling use of simple applications to advanced digital skills targeted at more complex requirements such as network management and data analytics. In addition, the articles present a number of concrete examples in capacity building projects carried out across different regions of the world. The third issue of the publication is expected to be launched in the second quarter of 2019.

e) Partnerships in support of capacity building

ITU continues to deliver training for developing countries in cooperation with its partners, including the African Advanced Level Telecommunications Institute (AFRALTI), the International Telecommunications Satellite Organization (ITSO), Rohde and Schwarz and the International Center for Theoretical Physics (ICTP) in Italy. In the past year, those training activities focused on the areas of satellite communication, spectrum monitoring and spectrum management, and Internet of Things. In partnership with the United Kingdom s Academy (UKTA), ITU continues to deliver the online Master of Communication Management through the ITU Academy. New partnership agreements were concluded with Wayfindr, to deliver training on the design of audio-based navigation systems for people with vision impairment; as well as with four partners in Latin America on the delivery of the Strategic Telecommunication Management Programme.

5. Digital Trust: Building Confidence and Security in the use of ICTs

ITU has worked in this area for over two decades and has a long list of activities spanning across three main sectors: Standardization, Development and Radiocommunications.

In 2005, ITU was entrusted as the sole facilitator for WSIS Action Line C5 on "Building confidence and security in the use of ICTs" and developed the Global Cybersecurity Agenda (GCA), an international framework for cooperation in the area of Cybersecurity. The GCA is built upon five strategic work areas (Legal Measures, Technical & Procedural Measures, Organizational Structures, Capacity Building, International Cooperation) that shape ITU's work until today.

ITU has focused on assisting Member States in defining a national strategy on cybersecurity, raising awareness in key stakeholder communities, conducting training workshops, developing programs for child online protection, and establishing national computer incident response teams (CIRTs), amongst other activities.

ITU's technical study groups provide a neutral, global platform for all stakeholders to come together and work on security-related standardization on a variety of topics, including, among others: Security architectures and frameworks; Distributed Ledger Technologies (of which Blockchains is an implementation); Artificial Intelligence and Security, the security of applications and services for IoT; Identity management; Smart grids. Till date, ITU-T SG17 has developed more than 200 standards on ICT security, covering wide ranges/aspects of ICTs.

ITU is also playing a very active facilitating role within the United Nations System, working closely with other agencies and bodies to improve the UN's internal coordination activities on cybersecurity.

To maximize impact ITU is further working closely with a number of partners ranging from International organizations, from Private sector and Academia, and benefitting from their expertise in their respective areas. For example:

- ITU has a close relationship with WEF in several areas, including cybersecurity. In relation to the newly established WEF Center for Cybersecurity, on 11 January 2019, ITU and WEF signed a letter of intent for the two organizations to cooperate in order to better understand the threat landscape in cyberspace, as well as to contribute to help reduce, contain and deter cyber threats and increase cyber capacities.
- Similarly ITU and Interpol are cooperating actively in cybersecurity including in child online protection through promoting capacity building efforts through mutual assistance, sharing of material and in other ways. ITU and Interpol signed a cooperation agreement in March 2018.

More details on ITU's activities in this area are given below:

a) Cybersecurity Strategy Development and Review

A National Cybersecurity Strategy publication launched officially at the ITU Telecom World 2018 carries a multi-stakeholder effort facilitated by ITU and in partnerships with 11 partners intergovernmental and international organizations, private sector, academia and civil society. The main goal of this toolkit is to assist countries in the development and implementation of national cybersecurity strategies including cyber-preparedness and resilience. It is a reference guide that represents a comprehensive one-stop resource for countries to gain a clear understanding of the purpose and content of a national cybersecurity strategy, and actionable guidance for how to develop a strategy of their own or with assistance. The reference guide further lays out existing practices, relevant models and resources. It was also developed an accompanying support tool to assist in using the tool for the development or evaluation of national cybersecurity strategies.

Besides of its goal to assist countries in the development and implementation of national cybersecurity strategies it also touches on national cybersecurity preparedness and resilience. BDT plans to further assist member states in capacity development in using the tool in workshops designed to assist in strategy development and in the same time through these workshops provide a platform for an international cooperation. Participating partners in the development of the guidance document:

b) [CIRT Assistance Programme](#)

Around CIRT Programme, BDT executes several activities that provide specific results at different stages:

- CIRT Readiness Assessment – the purpose of this activity is to review the current situation in countries expressed the interest to implement a CIRT and provide a report that the
- CIRT Design - the purpose of this activity is to provide a CIRT design document
- CIRT Implementation – Basic and Enhanced Services

Until now ITU has conducted 75 CIRT readiness assessment and successfully executed thirteen (13) CIRT Project implementations and in 2019, BDT has planned to complete the implementation of five (5) national CIRTs.

c) Measuring Cybersecurity Progress – [The Global Cybersecurity Index](#)

Following the successful launch of two previous editions of the Global Cybersecurity Index (GCI), in 2019 ITU will publish the results of the third edition, GCI-2018, where data have been collected from 155 countries, GCI measures countries' progress in the area of cybersecurity and helps them to identify areas for improvement. Through the information collected, it aims to illustrate the practices in use so that ITU Member States can identify gaps and improve in the areas they lack if they represent the priority to their national development strategy – on its own the GCI provides added benefits in harmonizing practices among ITU Member States and enhances commitments in fostering a global culture of cybersecurity.

d) Cybersecurity Exercises ([CyberDrills](#)) - Capacity and Capability Development

ITU conducts regional and national CyberDrills for ITU Member States. At regional level, we have had exercises where more than 15 countries have participated in the cybersecurity exercises in the areas of incident response, response coordination on national and regional levels, etc. The aim of CyberDrills is to enhance the communication between participating teams' and further improve the incident response capabilities, along with maintaining and strengthening the national and international cooperation among countries in ensuring continued collective effort against cyber threats. ITU conducted twenty-five (25) CyberDrills involving more than 100 countries. In 2019 it is planned to conduct CyberDrills in Europe Region (Romania), Africa Region (South Africa), Asia-Pacific Region (Sri Lanka), Arab Region (TBD) and CIS Region (TBD) and BDT is in discussions to assist Argentina on a national cybersecurity exercise. Exercises are executed with various partners, depending on the region (information about partners can be found on the [CyberDrills Page – Partners Section](#)).

e) Awareness Creation and Information Sharing

ITU continuously organizes, co-organizes and participates in activities that foster awareness creation and information sharing. There are various platforms where ITU Membership creates awareness and share information such as WSIS, various conferences and meetings.

f) Global Partnership Development and Collaboration

Cyberspace has no borders most of the time and Cyberthreats reach national critical infrastructures not bound to national limits – international and multi-stakeholder collaboration is necessary to keep abreast of current cybersecurity threats and challenges. ITU put very strong emphasis on global cooperation and development of strategic partnerships in the areas of cybersecurity. ITU facilitates beneficial synergies and maintains valuable global partnerships to enhance cybersecurity and promote a need for a safe digital environment for all. ITU partners are grouped in:

- Intergovernmental Organizations – examples: UNICRI, UNODC, The Commonwealth, CTO, EC, ENISA, etc.
- International Organizations – FIRST, ISOC, WEF, GFCE, MERIDIAN, etc.
- Private Sector – Deloitte, Guardtime, Microsoft, HP, Symantec, High-Tech Bridge, Kaspersky, etc.

- NGOs, Civil Society, Academia, Philanthropies – Indiana University, Potomac Institute for Policy Studies, Australian Strategic Policy Institute, Geneva Center for Security Policy, etc.
- Government or Public Sector affiliated – KISA (Korea Internet and Security Agency), NTRA Egypt, etc.

g) Child Online protection Global Initiative (COP)

ITU launched the [Child Online Protection \(COP\) Initiative](#) in November 2008 as a multi-stakeholder effort within the Global Cybersecurity Agenda (GCA) framework. The initiative brings together partners from all sectors of the global community to create a safe and empowering online experience for children around the world. In cooperation with diverse stakeholders, ITU has been providing guidance and building capacity in various countries - involving policy makers, parents, educators and children.

h) Technical Standards (ITU Recommendations)

ITU's Standardization Sector produces international technical standards, referred to as "Recommendations", in order to enable better harmonization and interoperability in international telecommunications and the use of ICTs. Standardization work is done within the framework of Study Groups, including ITU-T SG17 on "Security" which has produced over 330 Recommendations (Standards) in the area of Cybersecurity and information security management. Some groups looking at emerging technologies include [ITU-T Focus Group on Application of Distributed Ledger Technology \(FG DLT\)](#), [ITU-T Focus Group on Machine Learning for Future Networks including 5G \(FG-ML5G\)](#), [ITU-T Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities \(FG-DPM\)](#) among others.

i) UN-wide framework of Cybersecurity and Cybercrime.

Following the clear recognition of Cybersecurity as an emerging issue back in 2010, the UN Chief Executives Board for Coordination (CEB) initiated a process for a coordinated action among all UN agencies.

Over the course of 4 years, an "UN-wide framework on Cybersecurity and Cybercrime" was developed by 35 UN agencies/bodies, with ITU and the United Nations Office on Drugs and Crime (UNODC) leading the coordination of the effort. The framework aimed to facilitate enhanced coordination among UN entities based on their respective roles and mandates. In November 2013, CEB endorsed this framework. As a follow-up a "UN System Internal Coordination Plan on Cybersecurity and Cybercrime" was formulated with the contribution of the entire UN System and endorsed by CEB on 20 November 2014. These two documents continue to serve as a solid basis for UN-wide collaboration in the related topics.

6. Data

6.1 ICT Statistics

One of the core activities of ITU, through its Development bureau, is the collection, verification and harmonization of telecommunication/ICT statistics for about 200 economies worldwide. There are two key sets of telecommunication/ICT data that ITU collects directly from countries:

- Telecommunication/ICT data collected from national telecommunication/ICT ministries and regulatory authorities: these include data on the fixed-telephone network, mobile-cellular services, Internet/broadband, traffic, revenues and investment; and prices of ICT services.
- Household ICT data collected from national statistical offices (NSOs): these include data on household access to ICTs and individual use of ICTs.

Related key activities include:

- [Dissemination of data](#) included in the [World Telecommunication/ICT Indicators database](#), through the web site, printed publications, CD-ROM, and by electronic download.
- Analysis of telecommunication/ICT trends and the production of [regional and global research reports](#).
- [Benchmarking ICT developments](#) and clarifying the magnitude of the digital divide (using tools such as the ICT Development Index and the ICT Price Basket).

- Contributing to the monitoring of internationally agreed goals and targets (such as the [MDGs](#) and [WSIS targets](#)).
- [Developing international standards](#) and methodologies on ICT statistics through close cooperation with other regional and international organisations and bodies, including the UN, OECD, Eurostat, and the [Partnership on Measuring ICT for Development](#).
- Organizing [meetings and events](#), including the [World Telecommunication/ICT Indicators Symposium](#).
- Providing [capacity building](#) and technical assistance to Member States in the area of ICT measurement and through the provision of training material and manuals.

6.2 ITU activities on Data Processing and management for IoT and Smart Cities & Communities

ITU-T Study Group 20 established the Focus Group (FG-DPM) which objectives are to study, review and survey existing technologies, platforms, guidelines and standards for data processing and management including data format in support of IoT and Smart Cities.

Following the analyses of use cases provided by different stakeholders, FG-DPM is developing the generic requirements for data processing and management. These requirements are supposed to be a basis for DPM Framework as a kind of conceptual model of DPM, which defines DPM capabilities, DPM actors and their business roles. All these requirements and DPM framework follow the approaches specified in the Recommendation ITU-T Y.4114 “Specific requirements and capabilities of the Internet of things for big data”.

Among other deliverables in terms of the data processing and management for IoT and SC&C, FG-DPM studies data format, data sharing procedures, data interoperability and Blockchain-based data exchange and sharing technology, security, privacy, including governance, data economy, commercialization, and monetization.

The updated list of deliverables and FG-DPM structure is available in [FG-DPM-O-130](#) at: www.itu.int/go/tfgdpm.

Focus Group on Machine Learning for future networks including 5G

Modern communication networks, and in particular mobile networks, generate a huge amount of data. Powerful machine learning (ML) methods can be used to extract and leverage this information for various tasks, however, the lack of a unified data format makes such an analysis a challenging problem. The application of ML technology to communication networks is further complicated by constraints and requirements such as limited computation resources, bandwidth or latency restrictions or distributed data. This working group will investigate data formats and ML technologies which are tailored for such a communications scenario.

Tasks are:

- How to collect, prepare, represent and process data for ML in the context of communication networks.
- How to include the study of privacy and security implications on data formats and ML techniques.
- What to compute, what data do we have, how fast to compute, how reliable and transparent it must be, where to do the computation, how much computational resources are available
- What are the requirements on the data: what data do we have, can we use all the data centrally, can we trust the data, is the data labeled, where is the data generated;
- What are potential network architectures (e.g., distributed, centralized, hybrid). Furthermore, this working group will engage in the categorization of ML algorithms used in communication networks.
- How different ML methods (e.g., neural networks, unsupervised methods, reinforcement learning) fit to different communications problems.
- Since data is usually distributed in a communication network, how can current ML technology be used in or extended to a distributed setting.

7. Inclusive digital economy

7.1. ITU Regulatory and Policy Work

In terms of ICT regulation, many longstanding issues are multi-faceted and complex, with new issues emerging and challenging regulators to formulate viable regulatory responses. By developing a collaborative approach to

regulation, the various sector regulators can contribute to reducing the regulatory conundrum, overlap and duplication across the economy, and provide for greater coherence, predictability and trust in the digital ecosystem. At the core of collaborative regulation are principles of strengthening institutional capacity and the legal mandate of the regulator, sound regulatory regimes and enhanced competition frameworks.

The *Best Practice Guidelines adopted by regulators from around the world at the 2019 ITU Global Symposium for Regulators*¹ recognized that flexible and innovative policy and regulatory approaches can support and incentivize digital transformation. Proactive measures and exchanges with all players in the value chain in the sector (start-ups, competition hubs, manufacturers, operators, as well as users), they said, are key for boosting the emerging digital ecosystem. ICT policy and regulatory frameworks need to be up-to-date, flexible, incentive-based and market-driven to support digital transformation across sectors and across geographical regions. Next-generation collaborative ICT regulatory measures and tools are the new frontier for regulators and policy makers as they work towards maximizing the opportunity afforded by the digital transformation.

ITU conducts several key actions to foster inclusive dialogues with the wider ICT community and across the sectors, and to achieve broad partnerships. ITU provides up-to-date regulatory and policy data, research and analysis and develops tools for an effective policy, legal and regulatory environment for the ICT sector.

a) Knowledge Exchange products and strategic dialogues to promote enabling ICT/telecommunications environment for digital transformation

ITU convenes global and regional forums to discuss global trends in regulation, through organizing the Global Symposium for Regulators (GSR) as well as strategic dialogues on policy, legal, regulatory, and economic and financial issues and market developments.

The [18th edition of the Global Symposium for Regulators \(GSR\)](#) was held from 9 to 12 July in Geneva under the theme of “New Regulatory Frontiers”. The GSR attracted over 600 participants including government ministers, heads of ICT national regulatory authorities and industry executives from more than 125 countries. GSR also provided a platform for knowledge exchange between regional regulatory associations and private sector Chief Executive Officers. During GSR, participants agreed that governments, the private sector as well as all stakeholders in the digital economy should seek synergies and leverage their strengths and resources toward achieving sustainable digital development for all. The event culminated with the adoption by ICT Regulators of a set of best practice guidelines on new regulatory frontiers to achieve digital transformation. The 19th edition of GSR will be held from 9 to 12 July 2019 in Port Vila, Vanuatu.

The Regional Economic Dialogues (REDs) are dedicated to the discussion of economic regulation and finance. In 2018, two REDs were organized in Africa and the Americas to examine the economic implications of future technologies (Internet of Things (IoT) and Machine-2-Machine (M2M), Cloud Computing, Big Data and Block chain) and their application in the each region. These Dialogues also examined existing and emerging opportunities and challenges and explored opportunities for creating an enabling environment for ICT competitiveness and growth in the regions.

To improve the synergy between ITU-D Study Groups and the strategic dialogues, ITU also organizes Experts’ Knowledge Exchange meetings.

ITU raises awareness and builds capacity through training sessions, workshops, seminars, and conferences focusing on ICT development, broadband infrastructure, applications and services, 5G, International Mobile Roaming (IMR), cost modelling and pricing, infrastructure development, policy and regulatory collaboration in the area of digital financial services and digital financial inclusion, and digital economy. These workshops also provide practical hands-on knowledge for regulators and sector members on evolving technology, p[olicy and economic issues.

ITU is in the process of developing further research and analysis, content material and training programmes to assist Member States in developing their regulatory and policy capacity and knowledge to accelerate digital

¹ https://www.itu.int/net4/ITU-D/CDS/GSR/2018/documents/Guidelines/GSR-18_BPG_Final-E.PDF

transformation.

b) Data, research and analysis on enabling ICT/telecommunications policy and regulatory environment

ITU provides high-quality data, research, analyses, and tools (GSR discussion papers, publications, databases) to support countries in implementing and reviewing strategies, policies, and legal and regulatory frameworks as well as in moving towards evidence-based decision-making. Publications included, among others, [ITU Reports](#) on:

- [ITU Thematic Reports](#)
- [2018 Global ICT Regulatory Outlook Report](#);
- [Setting the stage for 5G: Opportunities and challenges](#);
- [The economic contribution of broadband, digitization and ICT regulation](#);
- [Powering the digital economy: Regulatory approaches to securing consumer privacy, trust and security](#)
- [Regulatory challenges and opportunities in the new ICT ecosystem](#);
- [Digital identity in the ICT ecosystem: an overview](#);
- [Maximising availability of international connectivity in developing countries: Strategies to ensure global digital inclusion](#)
- The Artificial Intelligence (AI) Development Series, divided in 4 discussion papers for GSR: a) Introductory module; b) Setting the Stage for AI Governance: Interfaces, Infrastructures, and Institutions for Policymakers and Regulators; c) AI, ethics and society; and d) AI, IoT and security aspects;
- A series of country studies on the use of ICTs and the digital ecosystem in selected countries in the Americas Region were prepared for Ecuador, Nicaragua, Panamá, Bolivia, Paraguay.
- [Maximising availability of international connectivity in the Pacific](#)
- [Digital financial services: Regulating for Financial Inclusion - An ICT Perspective](#)
- [The APP economy in Africa: Economic benefits and regulatory directions](#)
- [Social and economic impact of digital transformation on the economy](#)
- Analysis of the social and economic impact of automation and digital transformation, its potential benefits, challenges and social and economic effects. GSR17 Discussion Paper

ITU tracks regulatory and market trends in the ICT sector with the ITU Regulatory and the ITU Tariff Policies surveys, which results are annually updated in the ITU [ICTEye platform](#) and the [ICT Regulatory Tracker](#).

ITU also develops knowledge exchange tools and platforms (such as Portals on [International Mobile Roaming \(IMR\) Resources](#), [the Digital Ecosystem](#), [Infrastructure Development](#), [Quality of Service](#), and a [Regional Regulatory Associations Portal](#)) to enable inclusive dialogue and enhanced cooperation and to raise national and regional awareness about the importance of an enabling environment.

ITU collaboratively works with organization on ICT centric innovation and digital transformation through specific events, knowledge sharing or initiatives. To share knowledge and enhance membership capabilities to accelerate digital transformation, ITU has published the Good practices for developing, driving and accelerating ICT-centric innovation ecosystems in Europe. This regional report on innovation aims to provide an overview of the many good practices in Europe, covering startups, government, academia, financing entities and more, towards accelerating digital transformation, which may serve as a basis for better policies in countries where gaps have been identified.

7.2 Digital Financial Services Work

a) New ITU Plenipotentiary Resolution on Use of ICTs to bridge the financial inclusion gap

The new Resolution recognizes that the issue of access to financial services is one of global concern and requires global collaboration and therefore the need for regulators from the telecommunication and financial services sectors to collaborate with one another and to share best practices, since digital financial services encompass areas, which fall under the purview of both parties. The Resolution invites ITU-T Study Groups to develop standards and technical guidelines for DFS providers and for ITU to foster collaboration and experience sharing in digital financial services among countries and regions, regulators from telecommunication and financial services sectors, industry experts and international and regional organizations.

b) Focus Group Digital Financial Services (FG DFS)

The [ITU-T Focus Group on Digital Financial Services](#) (FG DFS) issued 85 policy recommendations for digital financial services and [28 supporting thematic reports](#). With more than 60 organizations from more than 30 countries, the Focus Group was the first initiative to bring together all the actors, including telecom regulators and representatives from central banks, working in the interests of financial inclusion. The Focus Group was chaired by Bill & Melinda Gates Foundation. The Focus Group completed its work in December 2016.

To build upon the momentum developed through the ITU FG DFS, the BMGF, the CPMI, the ITU, and the World Bank – in collaboration with other public- and private-sector stakeholders – launched the Financial Inclusion Global Initiative (FIGI). This multiparty initiative provides a platform for countries to share lessons learned, strengthen the enabling environment for DFS through implementation of the recommendations and principles developed by the ITU, CPMI, World Bank, and the Bill & Melinda Gates Foundation.

The reports of the FG DFS are being incorporated as inputs to new standards and technical guidelines for DFS. The report on the definitions of terms in DFS has been adopted in ITU-T Study Group 3 as a technical report and also published as a joint ITU-UPU report. The report on consumer protection from FG DFS is also being considered as inputs to a new Recommendation on principles for Consumer Protection for DFS in ITU-T SG 3. The report on Quality of Service for DFS led to the creation of a new work item on this topic in SG 12.

c) Financial Inclusion Global Initiative (FIGI)

The Financial Inclusion Global Initiative (FIGI) is a joint project by the International Telecommunication Union (ITU), the World Bank Group (WBG) and the Committee on Payments and Market Infrastructures (CPMI), with support from the Bill & Melinda Gates Foundation and was launched in July 2017. FIGI's main objectives are to support and accelerate the implementation of country-led reform actions in developing and emerging markets to better utilize the potential of digital technologies to meet national financial inclusion targets, and ultimately the global 'Universal Financial Access 2020' goal.

FIGI consists of three main components:

- Country implementation of FG DFS Recommendations, Payment Aspects of Financial Inclusion (PAFI) recommendations and Level One Principles of Gates Foundation (led by World Bank). Country implementation is currently taking place in Mexico, Egypt and China
- Annual FIGI Symposium (Led by ITU)
- Three working groups on Digital ID, Electronic Payments Acceptance and Security, Infrastructure and Trust to support the country implementation. ITU leads the Security, Infrastructure and Trust WG.

The FIGI Symposium aims to:

- provide a unique platform for regulators, policymakers and DFS experts to share lessons learned about the different digital financial models and services, the regulatory sandbox approach, ways to mitigate risks in fast changing ICT and digital payment environments, and the impact of emerging technologies on the ecosystem;
- showcase digital financial inclusion initiatives and innovations taking place at the international level; and
- provide thought leadership on digital financial inclusion strategies and technological innovations in the area of DFS.

The first edition of the FIGI Symposium was held in India in 2017. The second edition of the Symposium was held on 22-24 January 2019 in Egypt and saw the participation of some 308 participants from the DFS ecosystem from 69 countries.

FIGI Videos

- +30 expert video interviews featured on the playlist: <https://youtu.be/nGCDmPmqQ5s>
- FIGI highlight video summarizing the Symposium: <https://m.youtube.com/watch?feature=youtu.be&v=4JQ5PGHW3rk>

- FIGI Hackathon highlight video: <https://www.youtube.com/watch?v=nGCDmPmqQ5s>

FIGI Working Groups are focused on developing knowledge, technical reports, and policy recommendations on the following three areas: Security, Infrastructure and Trust, Digital ID for Financial Services, and Electronic Payments Acceptance.

- **Security, Infrastructure and Trust Working Group:** The main objective is to identify effective mitigation strategies and measures to address the changing threats and vulnerabilities landscape in the DFS ecosystem in order to preserve confidentiality of information, integrity of transactions and availability of the service. The work of the group encompasses the following areas: address communications infrastructure vulnerabilities (e.g SS7 security), application security testing, interoperable authentication technologies, security of distributed ledger technologies and use cases for financial inclusion, monitoring the quality of service of the network and quality of experience for DFS, unlicensed digital investment schemes and data privacy risks of emerging technologies and cybersecurity for financial services sector.
- **Digital ID for Financial Services Working Group:** The main objective is to identify and accelerate the appropriate use of unique and legal digital identification for lower the barriers of access to, and improving uptake of, financial services. The group explores the following promising areas, among others: reducing the cost of onboarding and providing transaction accounts and other financial services to individuals and MSMEs; the use of IDs to facilitate Government to Person (G2P) payments and merchant payments; and the use of alternate data sources to contribute to a Digital Identity.
- **Electronic Payments Acceptance Working Group:** The main objective is to foster effective practices for enabling and encouraging acceptance and use of electronic payments, with an emphasis on person-to-business (P2B) payments, both for proximity payments at the point of interaction and e-commerce, and on unserved and underserved groups. The work of the group encompasses the following areas: pricing and incentives, use of data generated by an individual or firm's payment activity, technological and process innovation, and intermediaries.

d) **Focus Group digital currency including digital fiat currency (FG DFC)**

FG DFC is studying the requirements for Central Bank to issue their own digital currency, the responsibilities of stakeholders in such an ecosystem, the reference architecture and security elements required for creating trust in such a service. The Focus Group acts a global platform to bring together digital financial services stakeholders – such as telecom regulators; financial services regulators; digital financial services providers, payment platform providers; mobile network operators; international organizations, Fintechs and industry forums – to share knowledge and lessons learned in the field to achieve the objectives mentioned above. The focus group is expected to complete its work in July 2019.

8. Artificial Intelligence

While AI is a cross-cutting theme, with various aspects covered in previous section, it is listed here separately as the panel, as well as UNSG's strategy has identified AI as a key area of focus.

ITU provides a neutral platform for government, industry and academia to build a common understanding of capabilities of emerging AI technologies and consequence needs for technical standardization and policy guidance.

a) **The AI for Good Global Summit**

In partnership with the sister UN agencies, ITU is organizing the annual "[AI for Good Global Summit](#)", which aims to accelerate and advance the development and democratization of AI solutions that can address specific global challenges related to poverty, hunger, health, equality, education, the environment and others. The first Summit took place from 7 to 9 June 2017, the 2nd Summit from 15 to 17 May 2018, and the 3rd Summit will take place from 28 to 31 May 2019.

b) Standardization in AI technology

- i) Machine Learning for 5G networks: Today's communication networks, both the current networks and the upcoming 5G networks, have not been designed to cope with big data analytics and Machine Learning (ML). Therefore, future networks need to be designed to do so. ITU's standards activity ("Focus Group on Machine Learning for Future Networks including 5G") analyzes the impact of ML on communication networks. Use cases from industry are driving the requirements on data formats and ML technologies. Based on these use cases, the group studies functional network architectures, data structures, interfaces, protocols and algorithms. The group is open to all interested parties.
- ii) AI for Health: ITU and WHO are joining forces to expand the use of AI in the health sector to a global scale, and to leverage the power of AI to advance health for all worldwide. The two organizations are working together through the ITU Focus Group on AI for Health, established in July 2018, to develop an international "AI for health" standards framework and to identify use cases of AI in the health sector that can be scaled-up for global impact. The group is open to all interested parties. The demand for such a platform was first identified by participants of the second AI for Good Global Summit held in Geneva, 15-17 May 2018. AI-powered technologies such as skin disease recognition and diagnostic applications based on symptom questions could be deployed on six billion smartphones by 2021.

The group is leading an intensive two-year analysis of international standardization opportunities towards delivery of a benchmarking framework of international standards and recommendations by ITU and WHO for the use of AI in the health sector. As part of this, the ITU Focus Group for AI for Health will also produce an assessment framework to standardize the evaluation and validation of AI algorithms -- including the identification of structured and normalized data to train AI algorithms. It will develop open benchmarks with the aim of these becoming international standards.

c) Policy and Strategy on AI technology

- i) Global Symposium for Regulators (GSR): The GSR brings together heads of national telecom/ICT regulatory authorities from around the world, and fosters a dynamic dialogues among regulators, policy makers, industry leaders and other key ICT stakeholders. The theme of this year's GSR, which took place from 9 – 12 July, was "Global Dialogue on AI, IoT and Cybersecurity – Policy and regulatory challenges and opportunities".

d) ITU Briefings on AI

ITU is organizing a series of Briefings to Permanent Missions in Geneva and also in New York. The first briefing was held at the ITU HQs in Nov. 2016, and provided an overview of the emerging trends, challenges and opportunities relating to 5G, followed by a briefings on various emerging technologies, including *Internet of Things*, *Role of ICTs in accelerating the achievement of SDGs*, and *Artificial Intelligence*, among others. The latest briefing was held at the High Level Policy Forum (HLPF) in New York, in June 2018.

e) Publications on AI

One of the main deliverables achieved by ITU has been strengthening of ITU's work with academic, R&Ds, and other research/consulting institutions. e.g., the first edition of ITU Journal "*ICT Discoveries*" released in March 2018 has explored novel applications of AI that can improve the performance and efficiency of communication infrastructure, systems, and components, create new services and ensure optimal user experience.

“Kaleidoscope 2018: Machine learning for a 5G future” is the tenth in a series of peer-reviewed academic conferences organized by ITU to bring together a wide range of views from universities, industry and research institutions. Kaleidoscope 2018 calls for original scientific papers addressing advances in research on machine learning and artificial intelligence techniques for future communication networks, covering all aspects of network design, management, implementation and optimization. This year's conference from 26 to 28 November 2018 takes place in Argentina.

In October 2018, ITU's issue paper on “*Assessing the economic impact of AI*” was also released, which aims to provide insights on the global economic impact of AI and so to improve the understanding of AI for a non-technical audience.

f) Repository of AI

Following the success of the first AI for Good Global Summit, ITU launched a global Artificial Intelligence (AI) repository to identify AI related projects, research initiatives, think-tanks and organizations that can accelerate progress towards the “17 UN Sustainable Development Goals (SDGs)”. The "AI Repository" is open to all and we invite anyone working in the field of AI to contribute to this resource.

g) UN Inter-agency efforts

ITU is contributing to inter-agency efforts on AI, especially in the High-Level Committee on Programmes (HLCP), by leading the coordination of internal strategic discussion papers to develop a better internal understanding of the impact of AI-related technologies on the work of the entire UN system, especially the opportunities in relation to the achievement of the SDGs.