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| World Telecommunication Standardization Assembly (WTSA-20)Geneva, 1-9 March 2022 | A picture containing text, clipart  Description automatically generated |
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| PLENARY MEETING | Document 28-E |
|  | January 2022 |
|  | Original: English |
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| Director of TSB |
| REPORT OF ACTIVITIES IN ITU-T OVER THE 2017–2021 STUDY PERIOD |
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| --- | --- |
| **Abstract:** | This report summarizes the status of ITU-T and TSB activities at the conclusion of the 2017-2021 study period. |
| **Contact:** | TSB Director  | Email: tsbdir@itu.int |

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Executive Summary

ITU approved over 1,600 new and revised ITU-T Recommendations and related texts in the study period. Executive summaries of ITU-T study group meetings can be found on their respective [homepages](https://www.itu.int/en/ITU-T/studygroups/Pages/default.aspx) and an index of study groups' activity reports to WTSA-20 is provided in [section 1](#_1_Achievements_in).

The "[AI-based mapping of ITU activities to UN-SDGs](https://aisdg.itu.int/)" maps ITU work to the United Nations Sustainable Development Goals according to semantic relevance. Developed by TSB, the solution continues to be improved with the support of feedback from ITU members and staff. See [section 1.1](#_1.1_AI-based_mapping).

Eight ITU-T focus groups are active and six completed activities in the study period. Information on the activities and deliverables of ITU-T focus groups can be found on their respective [homepages](https://www.itu.int/en/ITU-T/focusgroups/Pages/default.aspx) and an index of these groups and their timeframes is provided in [section 2](#_2_ITU-T_Focus).

ITU-T membership maintains stable growth. ITU-T now hosts 269 Sector Members and 221 Associates, as compared to 252 Sector Members and 127 Associates in 2016. ITU Academia members now total 161, with this figure standing at 103 in 2016. 43 of ITU-T's Associates are now participating under the reduced fee structure for small and medium-sized enterprises which came into effect on 31 January 2020. See [section 9](#_9_Membership).

The COVID-19 pandemic has highlighted the value of ITU-T’s electronic working environment. Virtual meetings and electronic working methods have come to form the principal platform for ITU standardization work as part of the global response to COVID-19, with ITU members making optimal use of the personalized [MyWorkspace](https://www.itu.int/net4/ITU-T/myworkspace/) platform and associated TSB services and tools such as MyMeetings. See [section 14](#_13_Services_and).

ITU-T collaboration initiatives are enhancing ITU-T work in support of digital transformation, with flagship initiatives addressing artificial intelligence and machine learning, digital financial inclusion and fintech, smart cities and communities, and intelligent transport systems. CTO and CxO meetings continue to bring together high-level industry executives to exchange views on industry priorities and related standardization activities. See [section 3](#_3_Collaboration_initiatives).

[ITU Academia membership](https://www.itu.int/hub/membership/), [ITU Kaleidoscope conferences](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) and the [ITU Journal on Future and Evolving Technologies](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) form key avenues for academics to engage in ITU’s work. Launched in September 2020, the ITU Journal provides comprehensive coverage of communications and networking paradigms free of charge for both readers and authors. See [section 4](#_4_Academia).

TSB continues to expand its activities in support of the achievement of Objective T.5 of the Strategic Plan of the Union, "Extend and facilitate cooperation with international, regional and national standardization bodies", by facilitating increased interaction between ITU-T and other standards bodies, in close collaboration with ITU Regional and Area Offices. See [section 5](#_5_Cooperation_and).

[ITU's Bridging the Standardization Gap (BSG) programme](https://www.itu.int/en/ITU-T/gap/Pages/default.aspx) improves the capacity of developing countries to participate in the development and implementation of international ICT standards. BSG training on the development of practical skills to maximize the effectiveness of developing countries' participation in the ITU-T standardization process have welcomed over 1,200 ITU-T delegates in the study period. See [section 11](#_11_Bridging_the).

TSB continues its efforts to include a gender perspective in all of its activities and programmes under the umbrella of the ITU Gender Task Force. In alignment with WTSA Resolution 55 (Rev. Hammamet, 2016), TSB continues to undertake actions to improve gender equality in TSB and ITU-T. Diversity of staff, gender equality and the empowerment of women continue to be among TSB's priorities. See [section 12](#_12_Gender).

The [ITU Conformity and Interoperability programme](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx) supports ITU's work to reduce the digital divide and standardization gap by assisting developing countries with human resource and infrastructure capacity building. The [Conformity Assessment Steering Committee](https://www.itu.int/en/ITU-T/studygroups/2013-2016/11/Pages/CASC.aspx) and [ICT product conformity database](http://www.itu.int/net/itu-t/cdb/ConformityDB.aspx) play an important part in ITU-T activities in support of this programme. See [section 6](#_6_Conformity_and).

ITU works to increase access to ICTs for persons with disabilities by raising awareness of their right to access ICTs, mainstreaming accessibility in the development of international ICT standards, and providing education and training on key accessibility issues. See [section 7](#_7_Mainstreaming_accessibility).

252 ITU-T [workshops and symposia](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/Pages/default.aspx) were organized in the study period, in addition to the weekly programming of the year-round [AI for Good](https://aiforgood.itu.int/) digital platform. ITU-T events held virtually are attracting a greater number and diversity of participants than the hybrid physical-virtual events held prior to the COVID-19 pandemic. See [section 10](#_10_Virtual_meetings).

Over 103,000 pages of ITU-T Recommendations and Supplements were published in the study period. All major editions of ITU-T Recommendations continue to be converted to the reflowable ePub format, and are published for free download alongside the usual PDF format. The ITU product "ITU-T Recommendations and selected Handbooks" continues to be distributed on a quarterly basis as a USB key. See [section 13.1](#_13.1_Recommendations_and).

TSB continues to collect all new terms and definitions proposed by ITU-T study groups, entering them into the online ITU Terms and Definitions database. TSB continues to translate all Recommendations approved under the Traditional Approval Process as well as all TSAG reports. In addition, TSB has translated 129 Recommendations approved under the Alternative Approval Process in the study period, in accordance with requests received from ITU-T study groups and linguistic groups, and within the available budget. See [section 13.1](#_13.2_Official_languages).

Annex – Full report of activities in ITU-T in the study period

# 1 Achievements in ITU-T Study Groups

ITU approved over 1,600 new and revised ITU-T Recommendations and related texts in the study period. For all ITU-T Recommendations in force, see the [catalogue of ITU-T Recommendations](https://www.itu.int/en/ITU-T/publications/Pages/recs.aspx). Executive summaries of ITU-T study group (SG) meetings can be found on their respective [homepages](https://www.itu.int/en/ITU-T/studygroups/Pages/default.aspx).

Activity reports from each SG can be found in the following WTSA-20 documents: [Doc 1](https://www.itu.int/md/T17-WTSA.20-C-0001) (SG2), [Doc 3](https://www.itu.int/md/T17-WTSA.20-C-0003) (SG3), [Doc 5](https://www.itu.int/md/T17-WTSA.20-C-0005) (SG5), [Doc 7](https://www.itu.int/md/T17-WTSA.20-C-0007) (SG9), [Doc 9](https://www.itu.int/md/T17-WTSA.20-C-0009) (SG11), [Doc 11](https://www.itu.int/md/T17-WTSA.20-C-0011) (SG12), [Doc 13](https://www.itu.int/md/T17-WTSA.20-C-0013) (SG13), [Doc 15](https://www.itu.int/md/T17-WTSA.20-C-0015) (SG15), [Doc 17](https://www.itu.int/md/T17-WTSA.20-C-0017) (SG16), [Doc 19](https://www.itu.int/md/T17-WTSA.20-C-0019) (SG17), and [Doc 21](https://www.itu.int/md/T17-WTSA.20-C-0021) (SG20).

## 1.1 AI-based mapping of ITU-T activities to UN-SDGs

The TSB-developed "[AI-based mapping of ITU activities to UN-SDGs](https://aisdg.itu.int/)" – accessible in [MyWorkspace](https://www.itu.int/net4/ITU-T/myworkspace/) with ITU User Account (TIES) credentials – applies artificial intelligence (AI) to map ITU work to the United Nations Sustainable Development Goals (SDGs) according to semantic relevance.

The solution has been applied to the work of ITU-T and ITU-D and continues to be improved with the support of feedback from ITU members and staff.

Below provides examples of different aspects of the solution's user interface, with data presented covering all ITU-T publications of the 2017-2021 study period.

Users first receive an overview of an ITU Sector's relevance to the SDGs. 100 per cent indicates that SDG9 ("Industry, innovation and infrastructure") is most relevant to ITU-T activities, with percentages for other SDGs indicating their relevance to ITU-T activities relative to that of SDG9.



Figure 1 – Overview of ITU-T activities' relevance to the SDGs

Selecting an SDG for ITU-T will return all ITU-T activities found to be relevant to the selected SDG.



Figure 2 – 747 ITU-T activities of the study period relevant to SDG9

Selecting "mapping details" will return activity-specific information on SDG relevance.



Figure 3 – Example of Recommendation ITU-T Y.3101 relevance to the SDGs

Selecting a particular SDG within activity-specific information, for example SDG9 below, will return sentences relevant to the SDG found in the activity.



 Figure 4 – Example of sentences relevant to SDG9 found in the deliverables of the ITU-T Focus Group on Network Aspects of IMT-2020

# 2 ITU-T Focus Groups

Below lists the ITU-T focus groups (FGs) of the study period, with section 2.1 listing active groups and section 2.2 listing groups that completed activities. More information on the activities and deliverables of each group can be found on their respective homepages. See also the [ITU-T focus groups homepage](https://www.itu.int/en/ITU-T/focusgroups/Pages/default.aspx).

## 2.1 Active groups

| **ITU-T Focus Group** | **Start date** |
| --- | --- |
| [Testbeds Federations for IMT-2020 and Beyond (FG-TBFxG)](https://www.itu.int/en/ITU-T/focusgroups/tbfxg/Pages/default.aspx) | 2021-12 |
| [AI and IoT for Digital Agriculture (FG-AI4A)](https://www.itu.int/en/ITU-T/focusgroups/ai4a/Pages/default.aspx) | 2021-10 |
| [AI for Natural Disaster Management (FG-AI4NDM)](https://www.itu.int/en/ITU-T/focusgroups/ai4ndm/Pages/default.aspx) | 2020-12 |
| [Autonomous Networks (FG-AN)](https://www.itu.int/en/ITU-T/focusgroups/an/Pages/default.aspx) | 2020-12 |
| [AI for Autonomous and Assisted Driving (FG-AI4AD)](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx) | 2019-10 |
| [Environmental Efficiency for AI and other Emerging Technologies (FG-AI4EE)](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/default.aspx) | 2019-05 |
| [AI for Health (FG-AI4H)](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx) | 2018-07 |
| [Vehicular Multimedia (FG-VM)](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx) | 2018-07 |

## 2.2 Concluded groups

|  |  |  |
| --- | --- | --- |
| **ITU-T Focus Group** | **Start date** | **End date** |
| [Quantum Information Technology for Networks (FG-QIT4N)](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx) | 2019-09 | 2021-11 |
| [Machine Learning for Future Networks including 5G (FG ML5G)](https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx) | 2018-11 | 2020-07 |
| [Technologies for Network 2030 (FG NET-2030)](https://www.itu.int/en/ITU-T/focusgroups/net2030/Pages/default.aspx) | 2018-07 | 2020-07 |
| [Application of Distributed Ledger Technology (FG DLT)](https://www.itu.int/en/ITU-T/focusgroups/dlt/Pages/default.aspx) | 2017-05 | 2019-06 |
| [Digital Currency including Digital Fiat Currency (FG DFC)](https://www.itu.int/en/ITU-T/focusgroups/dfc/Pages/default.aspx) | 2017-05 | 2019-06 |
| [Data Processing and Management to support IoT and Smart Cities & Communities (FG-DPM)](https://www.itu.int/en/ITU-T/focusgroups/dpm/Pages/default.aspx) | 2017-03 | 2019-07 |

# 3 Collaboration initiatives

## 3.1 Artificial intelligence and machine learning

**AI for Good:** [AI for Good](https://aiforgood.itu.int/) is the United Nations platform for AI. It is the world’s premier platform to advance AI’s contribution to sustainable development.

AI for Good is now presented as a year-round digital platform where AI innovators and problem owners learn, build and connect to help identify practical AI solutions to advance the SDGs. AI for Good is supported by close to 40 UN partners as well as a range of industry sponsors.

The AI for Good digital platform has accelerated the momentum created by the AI for Good Global Summits held in Geneva in 2017, 2018, and 2019.

The digital platform reached an audience of over 180,000 people from 182 countries in 2021, figures that can be viewed in comparison with the approximately 2,300 people from 92 countries reached with the hybrid virtual-physical format of 2019.

The majority of the ITU-T focus groups addressing AI and machine learning (ML) (see [section 2](#_2_ITU-T_Focus)), as well as the Global Initiative on AI and Data Commons (see [section 5.6](#_5.6_External_cooperation)) and the AI for Road Safety initiative (see [section 3.4](#_3.4_Intelligent_transport)), were first conceptualized during AI for Good activities and the AI for Good digital platform remains integral to the activities of such focus groups and initiatives.

AI for Good features weekly [programming](https://aiforgood.itu.int/programme/) with the following programming streams.

Learn:

* AI for Good Keynotes
* AI for Good Webinars
* AI for Good Discovery (trustworthiness, health, climate science)
* AI for Good Perspectives
* AI for Good On the Go
* AI for Good Blog

Build:

* AI for Good Machine Learning 5G Challenge
* AI for Good Innovation Factory
* AI for Good related (Pre-)Standardization Efforts & Initiatives
AI for Good Breakthroughs
* AI for Good Gateway

Connect:

* AI for Good Global Summit
* AI for Good Artistic Intelligence
* UN AI Actions
* AI for Good Brain Trust
* AI for Good Neural Network (coming soon)

**ITU Challenge on AI/ML in 5G:** The Challenge enables participants to connect with new partners in industry and academia – and new tools and data resources ­– to achieve goals set out by problem statements contributed by industry and academia. The Challenge remains in focus throughout the year in a [series of AI for Good webinars](https://aiforgood.itu.int/eventcat/ai-ml-in-5g/).

The Challenge encourages and supports the growing community driving the integration of AI/ML in networks (through problem statements, webinars, roundtables, etc.) and at the same time enhances the community driving standardization work for AI/ML.

The [first edition of the Challenge in 2020](https://aiforgood.itu.int/about/aiml-in-5g-challenge/) welcomed over 1,300 participants from 62 countries. The Challenge was sponsored by the Telecommunications Regulatory Authority of the United Arab Emirates (Gold sponsor) and Cisco and ZTE (Bronze sponsors).

[The second edition in 2021](https://aiforgood.itu.int/about/aiml-in-5g-challenge/) welcomed over 1,600 participants from 82 countries and culminated with a Grand Challenge Finale on 14 December 2021. The Challenge was sponsored by Xilinx and the Republic of Korea’s Ministry of Science and ICT.

To share the solutions with the larger community, solutions submitted are shared as open source in several repositories on the Challenge GitHub: <https://github.com/ITU-AI-ML-in-5G-Challenge>.

In addition, the [ITU Journal on Future and Evolving Technologies](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) published its first special issue on "AI/ML solutions in 5G and future networks" in October 2021, composed of 10 papers sharing solutions and learnings from participants and Challenge hosts in 2020 (i.e., the originators of the problem statements). Solutions and learnings from the 2021 edition of the Challenge will be shared by a second special issue on the topic to be published in 2022 – see [Call for Papers](https://www.itu.int/en/journal/j-fet/2022/004/Pages/default.aspx).

See [ITU News Magazine](https://www.itu.int/fr/myitu/Publications/2020/12/10/08/43/ITU-News-Magazine-no-5-2020) dedicated to the first edition of the Challenge in 2020.

## 3.2 Digital financial inclusion and fintech

**Financial inclusion:** The[Financial Inclusion Global Initiative (FIGI)](https://figi.itu.int) – led by ITU, the World Bank Group and the Committee on Payments and Market Infrastructures, with support from the Bill & Melinda Gates Foundation – has advanced research in digital finance and supported the acceleration of digital financial inclusion in developing countries. ITU led the FIGI Working Group on ‘Security, Infrastructure and Trust’ as well as the organization of FIGI symposia.

The third and final FIGI Symposium was held online over six weeks from 18 May to 24 June 2021. The recordings of the sessions of the Symposium can be accessed online [here](https://figi.itu.int/programme/). The event saw participation of 1,782 live participants from 148 countries over the six-week period and the recordings continue to be accessed.

The [2021 online FIGI symposium](https://figi.itu.int/) followed 2017 and 2019 FIGI symposia in Bengaluru, India, and Cairo, Egypt.

* [FIGI Symposium, Bengaluru, India](https://www.itu.int/en/ITU-T/extcoop/figisymposium/2017/Pages/default.aspx), 29 November to 1 December 2017
* [FIGI Symposium, Cairo, Egypt](https://www.itu.int/en/ITU-T/extcoop/figisymposium/2019/Pages/default.aspx), 22-24 January 2019

**DFS Security Lab:** A new security lab set up at ITU under FIGI will continue to support regulators and innovators in ensuring the security and resilience of financial applications and enabling infrastructure. The [DFS Security Lab](https://figi.itu.int/figi-resources/dfs-security-lab) is a product of the ITU-led FIGI Working Group on "Security, Infrastructure and Trust".

The lab provides a structured approach to security audits of DFS applications. This structured approach targets greater consistency in the implementation of controls to protect personal data and the integrity and confidentiality of financial transactions.

Four main objectives:

The lab support government and industry in assessing compliance with established best practices in DFS security, establishing a security baseline for DFS applications, and adopting interoperable authentication technologies. It also organizes clinics for security professionals to exchange knowledge and stay up to date with the evolution of security risks and associated mitigation techniques.

The lab will provide:

* Guidance to regulators in assessing the security of DFS infrastructure and conducting security audits of DFS applications
* Mechanisms for threat-intelligence sharing
* Guidance on implementing international standards for DFS security
* Assessments of cybersecurity preparedness across DFS value chains

The lab addresses the security of DFS applications running over legacy as well as cutting-edge network infrastructure, offering tests for DFS apps based on Unstructured Supplementary Service Data (USSD) and SIM Toolkit (STK), as well as tests for Android DFS apps are based on the Top 10 Mobile Risks from the Open Web Application Security Project (OWASP).

The lab conducted its first six [DFS Security Clinics](https://www.itu.int/en/ITU-T/webinars/dfs/sc/Pages/default.aspx) in 2021, sponsored by the Republic of Korea's Ministry of Science and ICT:

* [Malawi](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211208/Pages/default.aspx), 7-8 December 2021, hosted by the Malawi Communications Regulatory Authority
* [Eswatini](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211129/Pages/default.aspx), 29-30 November 2021, hosted by the Eswatini Communications Commission
* [Nigeria](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211117/Pages/default.aspx), 17-18 October 2021, hosted by the Nigerian Communications Commission
* [Zimbabwe](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211027/Pages/default.aspx), 27-28 October 2021, hosted by the Postal & Telecommunications Regulatory Authority of Zimbabwe
* [Tunisia](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211022/Pages/default.aspx), 22-23 October 2021, hosted by the Institut Supérieur des Etudes Technologiques en Communications de Tunis
* [Malawi](https://www.itu.int/en/ITU-T/webinars/dfs/sc/20211012/Pages/default.aspx), 12-14 October 2021, hosted by the Malawi Communications Regulatory Authority

**Digital currency:** The [Digital Currency Global Initiative](https://www.itu.int/en/ITU-T/extcoop/dcgi/Pages/default.aspx) is a collaboration between ITU and Stanford University established in July 2020. The Initiative is an open platform for dialogue and research on pilot implementations of digital currency, their use cases, applications and developing specifications for technical standards that will foster adoption, universal access, and ultimately financial inclusion.

Its main objectives are:

* Conduct further research on technical architecture, security, the technical implications and challenges in deployment caused by regulatory and policy requirements for central bank digital currency and other digital currencies, technology trends in digital currency and the use cases related to financial inclusion, operational efficiency and interoperability.
* Develop a set of metrics by which to evaluate the robustness of various digital currency technologies against the requirements set by various stakeholders.
* Identify areas for standardization to enable implementation of digital currency.
* Organize a conference on an annual basis to share information on best practices, technical standards and lessons learned on digital currency implementation.

Two webinars were held under the auspices of the Digital Currency Global Initiative in the reporting period:

* 23 November 2021: [Design of Wholesale Central Bank Digital Currency​](https://www.itu.int/en/ITU-T/webinars/dcgi/20211123/Pages/default.aspx)
* 19 November 2021: [Insights on Retail Central Bank Digital Currencies Implementation](https://www.itu.int/en/ITU-T/webinars/dcgi/20211119/Pages/default.aspx)

The [DC3 Conference: *From Cryptocurrencies to Central Bank Digital Currencies*](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2022/0125/Pages/default.aspx), 25-27 January 2022, highlighted the work of the Digital Currency Global Initiative as well as emerging industry trends and initiatives in digital currencies, particular with regard to:

* The latest trends in central bank digital currency, cryptocurrency and stablecoins.
* Emerging developments and areas where standards are needed for the architecture and interoperability of digital currencies and their integration with existing payment systems.
* Topics such as interoperability for central bank digital currencies and stablecoins and securing digital currency systems.
* Fostering dialogue among digital currency ecosystem stakeholders and regulators on key lessons learned from digital currency pilot implementations.

## 3.3 Smart cities and communities

The [United for Smart Sustainable Cities (U4SSC)](http://www.itu.int/en/ITU-T/ssc/united/Pages/default.aspx) initiative is supported by 17 United Nations bodies with the aim of achieving the SDG11 ("Make cities and human settlements inclusive, safe, resilient and sustainable").

Over 150 cities worldwide are evaluating their progress towards smart city objectives and the SDGs using [U4SSC Key Performance Indicators for Smart Sustainable Cities](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx) based on ITU standards. The results of the KPI evaluations are shared by [city snapshots, factsheets, verification reports](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx) and case studies.

The [U4SSC Implementation Programme](https://www.itu.int/en/ITU-T/ssc/united/Pages/U4SSC-IP.aspx) is supporting cities' pursuit of the SDGs by working together with national administrations and city leaders to building a comprehensive approach to smart city development, looking at both KPI evaluations and wider national contexts for planning and action.

U4SSC is developing expert guidance on topics including:

* ICT-based smart city platforms support the digital transformation of public services and their integrated management.
* Cities’ resilience in the face of emergencies such as COVID-19 and routes to economic and financial recovery.
* Public procurement in the digital age to support city leaders in establishing effective processes for the procurement of ICT solutions for smart cities.
* Tools and mechanisms to finance smart city projects, benefiting from the contributions of a wide variety of smart city stakeholders in the public and private sectors.
* The potential for frontier technologies to contribute to smart city innovation, looking at smart-city use cases of technologies in fields such as AI and blockchain.

The [deliverables](https://www.itu.int/en/ITU-T/ssc/united/Pages/publications-U4SSC.aspx) published during the study period are listed below:

* Smart public health emergency management and ICT implementations (December 2021)
* Compendium of survey results on integrated digital solutions for city platforms around the world (December 2021)
* Digital solutions for integrated city management and use cases (December 2021)
* Guidelines on tools and mechanisms to finance smart sustainable cities projects (August 2021)
* Simple ways to be smart (March 2021)
* Blockchain for smart sustainable cities (November 2020)
* Accelerating city transformation using frontier technologies (September 2020)
* A guide to circular cities (June 2020)
* City science application framework (October 2019)
* Connecting cities and communities with the Sustainable Development Goals (September 2017)
* Enhancing innovation and participation in smart sustainable cities (September 2017)
* ​Implementing SDG11 by connecting sustainability policies and urban-planning practices through ICTs (September 2017)
* Collection Methodology for Key Performance Indicators for Smart Sustainable Cities (September 2017)

## 3.4 Intelligent transport systems

The [Collaboration on ITS Communication Standards (CITS)](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx) is a forum supporting the coordination of an internationally accepted, globally harmonized set of Intelligent Transportation Systems (ITS) communication standards of the highest quality in the most expeditious manner possible to enable the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

CITS meetings are typically held twice a year, in March and September, and often organized back-to-back with other ITS events, e.g., annual [ITU-UNECE Symposia on the Future Networked Car](https://www.itu.int/en/fnc/Pages/default.aspx), that also provide opportunities to exchange information and keep experts updated on ITS standardization. The representatives of involved standards bodies are invited to submit status reports on ITS standardization ongoing in their respective organizations to CITS meetings.

CITS maintains the global [ITS Communication Standards Database](https://www.itu.int/net4/ITU-T/landscape#?topic=0.131&workgroup=1&searchValue=&page=1&sort=Revelance). The database is designed to assist the harmonization of ITS standards and includes standards developed by all relevant standards bodies, providing a reference to all standards supporting connected vehicles and automated driving.

A new [AI for Road Safety initiative](https://aiforgood.itu.int/about/ai-ml-pre-standardization/ai4roadsafety/) launched in October 2021 at an [AI for Good webinar](https://aiforgood.itu.int/event/ai-for-road-safety/)aims to leverage AI in enhancing the "safe system approach to road safety" in line with the UN General Assembly Resolution ([UN A/RES/74/299](https://undocs.org/en/A/RES/74/299)) on improving global road safety, which highlights the role of innovative automotive and digital technologies in this regard. The initiative is led by ITU together with the offices of the UN Secretary-General’s Special Envoy for Road Safety and the UN Secretary-General's Envoy on Technology. The initiative will also support the achievement of SDG target 3.6 to halve the annual number of global deaths and injuries from road traffic accidents by 2030, and SDG target 11.2 to provide access to safe, affordable, accessible and sustainable transport systems for all by 2030.

## 3.5 CTO and CxO meetings

[CTO and CxO meetings](http://www.itu.int/en/ITU-T/tsbdir/cto/Pages/default.aspx) bring together high-level industry executives together with the senior management of TSB to exchange views on industry priorities and related standardization activities.

**CxO Meeting**, 7 December 2021, Telecom Review Leader's Summit, Dubai, United Arab Emirates (Hybrid meeting with attendance online and in-person in Dubai)

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_ITU_CxO_07.12.2021_f.pdf)

**CxO Meeting**, 11 December 2019, Telecom Review Leader's Summit, Dubai, United Arab Emirates

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/CxO/Documents/Communique%20-%20CxO%20-%20Dubai%202019.pdf)

**11th CTO Meeting**, 8 September 2019, ITU Telecom World, Budapest, Hungary

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_CTO_08-09-19.pdf)

**China-Japan-Korea CTO Consultation Meeting**, 16 July 2019, Tokyo, Japan

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_CJK_CTO_16-07-19.pdf)

**10th CTO Meeting**, 9 September 2018, ITU Telecom World, Durban, South Africa

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/CTO_Communique_SA_Final%282%29.doc)

**North-American CTO Meeting**, 9 May 2018, California, Unites States

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_CTO_.pdf)

**CxO Meeting**, 7 December 2017, Telecom Review Leader's Summit, Dubai, United Arab Emirates

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/CxO/Documents/CxO_Communique_7Dec.pdf)

**9th CTO Meeting**, 24 September 2017, ITU Telecom World, Busan, Republic of Korea.

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/final_communique.pdf)

**CTO Consultation Meeting**, 30 March 2017, San Jose, California, United States

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/170330/communique-170330.pdf)

**8th CTO Meeting**, 13 November 2016, Bangkok, Thailand

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/161123/Communique%20-%20CTO%20meeting%20Bangkok%20-%20final.pdf)

**CxO Meeting**, 23 October 2016, Yasmine Hammamet, Tunisia

* [Communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/161023/CxO_final_communique.pdf)

# 4 Academia

[ITU Academia membership](https://www.itu.int/hub/membership/), [ITU Kaleidoscope conferences](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) and the [ITU Journal on Future and Evolving Technologies](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) form key avenues for academics to engage in ITU’s work. The journal is the latest addition to ITU’s suite of services to academia.

## 4.1 ITU Journal

The [ITU Journal on Future and Evolving Technologies (ITU J-FET)](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) launched in September 2020, provides comprehensive coverage of communications and networking paradigms and is free of charge for both readers and authors. ITU J-FET addresses fundamental and applied research sharing new techniques, concepts, analyses, and tutorials while discussing implications of the latest research on policy, regulations, legal frameworks and the economy and society. It welcomes submissions at any time, on any topic within its scope, and publishes papers continuously throughout the year.

ITU J-FET published its first regular issue in December 2020, second regular issue in April 2021, and third regular issue in December 2021. Published papers are available to download free of charge from the [ITU Digital Library](https://www.itu.int/pub/S-JNL).

ITU J-FET published five special issues in 2021:

* [AI and machine learning solutions in 5G and future networks](https://www.itu.int/en/journal/j-fet/2021/005/Pages/default.aspx)
* [Internet of Everything](https://www.itu.int/en/journal/j-fet/2021/002/Pages/default.aspx)
* [Internet of Bio-NanoThings for health applications](https://www.itu.int/en/journal/j-fet/2021/001/Pages/default.aspx)
* [Terahertz communications](https://www.itu.int/en/journal/j-fet/2021/003/Pages/default.aspx)
* [Wireless communication systems in beyond 5G era](https://www.itu.int/en/journal/j-fet/2021/004/Pages/default.aspx)

Ten new special issues are under development:

* [AI-driven security in 5G and beyond](https://www.itu.int/en/journal/j-fet/2022/005/Pages/default.aspx)
* [Towards vehicular networks in the 6G era](https://www.itu.int/en/journal/j-fet/2022/001/Pages/default.aspx)
* [AI and machine learning solutions in 5G and future networks](https://www.itu.int/en/journal/j-fet/2022/004/Pages/default.aspx)
* [Future of networking beyond 2030](https://www.itu.int/en/journal/j-fet/2022/006/Pages/default.aspx)
* [Integrated and autonomous network management and control for 6G time-critical applications](https://www.itu.int/en/journal/j-fet/2022/002/Pages/default.aspx)
* [Digital continuum and next generation networks](https://www.itu.int/en/journal/j-fet/2022/007/Pages/default.aspx)
* [Emerging trends and applications in future communication networks](https://www.itu.int/en/journal/j-fet/2022/009/Pages/default.aspx)
* [Innovative network solutions for future services](https://www.itu.int/en/journal/j-fet/2022/003/Pages/default.aspx)
* [Intelligent surfaces and their applications towards wide-scale deployment](https://www.itu.int/en/journal/j-fet/2022/008/Pages/default.aspx)
* [Network virtualization, slicing, orchestration, fog and edge platforms for 5G and 6G wireless systems](https://www.itu.int/en/journal/j-fet/2022/010/Pages/default.aspx)

A joint ITU-Tsinghua University Press journal on [Intelligent and Converged Networks](http://icn.tsinghuajournals.com/) was established in 2019 with the support of co-publishing agreement signed by ITU and Tsinghua University Press Ltd. All published papers are available on the [IEEE *Xplore* Digital Library](https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=9195266).

## 4.2 ITU Kaleidoscope academic conferences

The [ITU Kaleidoscope](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) series of peer-reviewed academic conferences – organized with the technical co-sponsorship of the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Communications Society – calls for original research on topics of growing strategic relevance to ITU-T.

* The 13th edition, [Connecting physical and virtual worlds](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2021/Pages/default.aspx), was held online, 6-10 December 2021.
* The 12th edition, [Industry-driven transformation](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2020/Pages/default.aspx), was held online, 7-11 December 2020. The conference welcomed a new supporter in the IEEE Technology and Engineering Management Society.
* The 11th edition, [ICT for Health: Networks, standards and innovation](https://www.itu.int/en/ITU-T/academia/kaleidoscope/2019/Pages/default.aspx), organized by ITU in collaboration with the World Health Organization, was held in Atlanta, U.S., 4-6 December 2019, the Georgia Institute of Technology. The conference welcomed a new technical co-sponsor in The Lancet Digital Health.
* The 10th edition, [Machine Learning for a 5G future](http://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx), was hosted by the Universidad Tecnológica Nacional, Santa Fé de la Vera Cruz, Argentina, 26-28 November 2018.
* The 9th edition, [Challenges for a data-driven society](http://www.itu.int/en/ITU-T/academia/kaleidoscope/2017/Pages/default.aspx), was hosted by the Nanjing University of Posts and Telecommunications, Nanjing, China, 27-29 November 2017.

# 5 Cooperation and coordination

TSB implements ITU-T Objective T.5 of the Strategic Plan of the Union, "Extend and facilitate cooperation with international, regional and national standardization bodies".

Memoranda of Understanding and Cooperation Agreements are listed and available on the relevant [web page](https://www.itu.int/en/ITU-T/extcoop/Pages/mou.aspx).

## 5.1 International standardization bodies

[World Standards Cooperation (WSC)](https://www.itu.int/en/ITU-T/extcoop/Pages/wsc.aspx)

The World Standards Cooperation (WSC) was established in 2001 by the International Telecommunication Union (ITU), the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC) in order to strengthen and advance the voluntary consensus-based international standards systems of ITU, ISO, and IEC.

* [World Standards Day](https://www.worldstandardsday.org/home.html), 14 October: ITU, ISO and IEC lead the celebrations of World Standards Day. "A Shared Vision for a Better World" was the theme of World Standards Day 2021, marking the start of a multi-year campaign aimed at raising awareness of how international standards contribute to the SDGs. [All past editions of World Standards Day](https://www.worldstandardscooperation.org/what-we-do/world-standards-day/).
* [International Standards Summit for People, Planet and Prosperity, 29 October 2021](https://www.worldstandardscooperation.org/what-we-do/g20/): Organized by ITU, ISO and IEC together with Italian Organization for Standardization and the Italian Electrotechnical Committee as part of G20 activities, the summit concluded a [Call to Action](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.worldstandardscooperation.org%2Fwhat-we-do%2Fg20%2F&data=04%7C01%7CBULAY%40iso.org%7C195225c8f8cf4a2d1dd608d99a140418%7C8543418a200d4d6b88c979fb0b651354%7C0%7C0%7C637710233024490842%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=9g4DklKmM2tmQzzK4E28a4H%2FCqWtG1w98JjaIXIrt6w%3D&reserved=0) to recognize, support and adopt international standards in order to contribute directly to the three pillars of the Italian G20 Presidency: People, Planet and Prosperity.
* [Riyadh International Standards Summit, 4 October 2020](https://events.saso.gov.sa/rss/): Organized by ITU, ISO and IEC together with the Saudi Standards, Metrology and Quality Organization (SASO) as part of G20 activities, the summit concluded with a [Call to Action](https://www.itu.int/en/myitu/News/2020/11/04/17/32/G20-call-to-action-on-international-standards) to recognize, support, and adopt international standards to accelerate digital transformation.

[Technical coordination mechanism among IEC, ISO and ITU-T/ITU-R (including ISO/IEC JTC1)](https://www.itu.int/en/ITU-T/extcoop/Pages/WSC-coordination.aspx)

IEC, ISO and ITU-T/ITU-R have agreed that four coordination levels are to be followed when an issue regarding collaboration is identified (source: [TSAG TD138](https://www.itu.int/md/T13-TSAG-140617-TD-GEN-0138/en)).

[Global Standards Collaboration (GSC)](https://www.itu.int/en/ITU-T/gsc/Pages/default.aspx)

GSC is an unincorporated voluntary organization dedicated to enhancing global cooperation and collaboration regarding communications standards and the related standards development environment.

[IEC SMB/ISO TMB/ITU-T TSAG Standardization Programme Coordination Group (SPCG)](https://www.worldstandardscooperation.org/what-we-do/standards-programme-coordination-group-spcg/)

The IEC SMB/ISO TMB/ITU-T TSAG Standardization Programme Coordination Group (SPCG) was established in 2018 by ISO TMB, IEC SMB, and ITU-T TSAG, and conducts strategic coordination of future standardization work, coordination of existing standardization work, short-term related tasks identified by the SPCG and approved by the technical boards of IEC, ISO and ITU-T. The approved SPCG terms of reference are [here](https://www.itu.int/en/ITU-T/extcoop/Documents/tor/ToR_SPCG.pdf).

[IEC-ISO-ITU Joint Smart Cities Task Force (J-SCTF)](https://www.itu.int/hub/2020/10/new-smart-city-standards-joint-task-force-established-by-itu-iso-and-iec/)

J-SCTF was established in 2020 and supports the coordination of IEC, ISO and ITU-T work on smart city standardization. It aims to ensure standardization solutions for smart cities are comprehensive, capitalizing on synergies among IEC, ISO and ITU-T. IEC hosts the J-SCTF document [repository](https://collaborate.iec.ch/#/pages/workspaces/735898/dashboard).

## 5.2 National and regional standardization bodies

By implementing ITU-T Objective T.5 of the Strategic Plan of the Union "Extend and facilitate cooperation with international, regional and national standardization bodies",
ITU-T/TSB has become more visible to national and regional standardization bodies, as well as built on and enhanced good collaboration with ITU Regional and Area Offices.

Throughout the study period, TSB has facilitated an ITU-T presence in the activities of national and regional standardization bodies, as well as encouraged national and regional standardization bodies' participation in ITU-T activities.

TSB’s efforts in this regard have strengthened the exchange of information between ITU-T and national and regional standardization bodies, supporting closer cooperation and collaboration.

Standardization bodies with which TSB has expanded cooperation in the study period include:

* African Regional Organization for Standardisation (ARSO)
* Pan American Standards Commission (COPANT)
* Pacific Area Standards Congress (PASC)
* Asia-Pacific Telecommunity Standardization Program (ASTAP)
* South Asian Regional Standards Organization (SARSO)
* GCC Standardization Organization (GSO)

An overview of the main engagements of TSB in this regard, organized in coordination with the ITU Regional and Area Offices, is provided below.

**2018:**

**CEN-CENELEC:** TSB participated in the CEN-CENELEC Annual Meetings, Bled, Slovenia, 21-22 June 2018.

**COPANT:** TSB participated in COPANT's Annual General Assembly in Montego Bay, Jamaica, 15-20 April 2018. In September 2018, TSB organized a meeting with COPANT executives on the work of ITU-T.

**PASC:** TSB participated in the 41st session of PASC in Okayama, Japan, 15-18 May 2018. Additionally, in the same year, TSB briefed PASC executives on the work of ITU-T.

**ARSO:**  TSB participated in the 24th ARSO General Assembly and in the African Day of Standardization in Durban, South Africa, 18-22 June 2018. In September 2018, TSB briefed ARSO executives on the work of ITU-T.

**2019:**

**CEN**-**CENELEC:** TSB participated in the CEN-CENELEC Annual Meeting in Bucharest, Romania, 5-7 June 2019.

**COPANT:** TSB participated in COPANT's Annual General Assembly in Cartagena,
Colombia, 5-8 May 2019.

**PASC:** TSB participated in the PASC Annual General Meeting in Wellington, New Zealand,
8-12 April 2019.

**ARSO:** TSB participated in the ARSO General Assembly in Nairobi, Kenya, 17-19 June 2019, where ITU and ARSO signed a [Cooperation Agreement](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/ARSO-ITU.pdf). The ITU Secretary-General and the senior management of BR and TSB welcomed the ARSO Secretary-General for an official visit to ITU on 4 July 2019. The TSB Director was invited to join the 61st ARSO Council meeting in 2019 to present ongoing standardization work relevant to the African Continental Free Trade Agreement, among other topics.

**GSO:** GSO and TSB signed a [Cooperation Agreement](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/GSO-ITU.pdf) in September 2019. Thanks to the ongoing engagement, GSO joined ITU-T membership in January 2021.

**SARSO:** TSB participated in a meeting with the SARSO Director and Deputy Director and proposed to further enhance the collaboration between the two organizations. In November 2019, TSB was invited to contribute to the South Asian Regional Standards Organization Board Meeting which took place in Dhaka, Bangladesh, in November 2019.

**2020:**

**ARSO:** TSB participated in the "Webinar: COVID-19 Interventions - The Standardisation Solution", 30 June 2020. Thanks to the ongoing engagement, ARSO joined the ITU-T membership in January 2021.

**PASC:** TSB participated in the PASC virtual meeting session with IEC, ISO and ITU on
20 May 2020. Within the framework of PASC, TSB participated in a virtual training session organized by Standards Australia on "Indo Pacific Digital Trade Standardization Initiative - training on international participation", 25 May 2020.

**2021:**

**COPANT:** A bilateral meeting between the COPANT Executive Secretary and the TSB Director took place in March 2021 to discuss and present the activities of the two organizations and how they could enhance their cooperation.

**CEN/CENELEC:** A meeting between CEN/CENELEC Director General and TSB took place in March 2021 to discuss and present ITU-T activities and how best the two organizations would cooperate.

**PASC:** TSB participated in the PASC Joint Panel with IEC and ISO on 19 May 2021.

**ASTAP:** TSB was invited to participate in theVirtual Meeting of the 33rd APT Standardization Program Forum (ASTAP-33), 7-11 June 2021.

## 5.3 TSB and ITU Regional and Area Offices

Throughout the study period, and in particular with reference to the ITU Plenipotentiary Resolution 25 (Rev. Dubai, 2018) "Strengthening the regional presence", ITU Regional Offices regularly shared information with the TSB Director on regional activities relevant to standardization and provided regular reports to TSAG.

At the initiative of the TSB Director, the study period hosted regular conference calls and face-to-face meetings between the ITU Regional and Area Offices and the TSB senior management, covering overviews, updates, and briefings of activities organized by each TSB department in the various regions.

These coordination activities, as well as the establishment of a TSB Focal Point for the Regions, were conducted keeping in mind the goal of improving coordination and increasing the efficiency of the overall operations, events and activities of TSB/ITU-T in the Regions.

The use of this coordination mechanism has been instrumental in significant improvements in the overall coordination with ITU Regional and Area Offices in terms of events and standardization activities.

The activity carried out during the whole study period, led to significant improvements in the overall coordination of standardization activities, operations and events of ITU-T across the Regions and also contributed to greater awareness of ITU-T standardization activities in all Regions.

## 5.4 Regional Organizations

Regional Organizations play a key role in the preparation of WTSA. With reference to WTSA Resolution 43 "Regional preparations for world telecommunication standardization assemblies",WTSA-20 regional preparatory meetings were carried out since 2019. TSB and ITU Regional and Areas Offices participated in the majority of these meetings.

For an overview of these meetings, see relevant [web page](https://www.itu.int/en/ITU-T/wtsa20/prepmeet/Pages/default.aspx).

## 5.5 ITU Sectors

TSAG maintains a close relationship with RAG and TDAG in order to develop synergies with the objective of strengthening coordination and cooperation among the three ITU Sectors on matters of mutual interest.

Three Inter-Sector Rapporteur groups (IRGs) work on items of interest to various ITU-T and ITU-R SGs.

* [IRG-AVA](https://www.itu.int/en/irg/ava): Intersector Rapporteur Group on Audiovisual Media Accessibility, among ITU-T SG9, ITU-T SG16 and ITU-R SG6. Meetings were held on 9 April 2021 and 23 September 2021.
* [IRG-AVQA](https://www.itu.int/en/irg/avqa): Intersector Rapporteur Group on Audiovisual Quality Assessment, among ITU-T SG12 and ITU-R SG6. A meeting was held on 9 June 2021, in conjunction with the Video Quality Expert Group (VQEG).
* [IRG-IBB](https://www.itu.int/en/irg/ibb): Intersector Rapporteur Group on Integrated Broadcast-Broadband, among ITU-T SG9, ITU-T SG16 and ITU-R WP 6B.

The Inter-Sector Coordination Team (ISCT) is composed of representatives of all three advisory groups, working to identify subjects of common interest to the three Sectors. It also seeks to identify the mechanisms necessary to strengthen cooperation and joint activities among the three Sectors, with particular emphasis on the interests of developing countries. In addition, the ITU Inter-Sectoral Coordination Task Force (ISC-TF) is coordinating activities among the three Bureaux. Both ISCT and of ISC-TF regularly report their progress to TSAG.

## 5.6 External cooperation

[Collaboration on ITS Communication Standards (CITS)](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx)

The intent of the CITS is to provide a globally recognized forum for the creation of an internationally accepted, globally harmonized set of ITS communication standards of the highest quality in the most expeditious manner possible to enable the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

[Digital Currency Global Initiative](https://www.itu.int/en/ITU-T/extcoop/dcgi/Pages/default.aspx)

The Digital Currency Global Initiative (DCGI) is collaboration between ITU and the Future of Digital Currency Program of Stanford University. DCGI continues the dialogue and research initiated by [FG DFC](https://www.itu.int/en/ITU-T/focusgroups/dfc/Pages/default.aspx) on pilot implementations, use cases, applications and developing specifications for technical standards that will foster adoption, universal access and ultimately financial inclusion. The goals of DCGI are to drive the synergistic engagement, innovative use, and standardization of digital currencies, which are the three pillars of the Initiative.

[FIGI resources for strong authentication](https://www.itu.int/en/ITU-T/extcoop/FIGIresources/authentication/Pages/default.aspx)

This is a compendium of resources for developers, provided under the Financial Inclusion Global Initiative (FIGI) to help foster the adoption of strong password-less authentication for user login and transaction confirmation especially for digital financial services. The resources mainly focus on demonstrating how easy and fast it is to eliminate the use of passwords with Recommendation ITU-T X.1277 that describes the Fast Identity Online (FIDO) Universal Authentication Framework.

[Financial Inclusion Global Initiative (FIGI) Symposium](https://www.itu.int/en/ITU-T/extcoop/figisymposium/Pages/default.aspx)

Three FIGI Symposium were held in 2017, 2019 and 2021 to provide a forum for dialogue regulators from telecom and financial services, DFS providers and all concerned stakeholders to share their experience and views on the main challenges to be addressed for scaling up DFS.

[Global Initiative on AI and Data Commons](https://www.itu.int/en/ITU-T/extcoop/ai-data-commons/Pages/default.aspx)

The Global Initiative on AI and Data Commons brings together AI specialists and data owners from industry, academia, member states, UN agencies and civil society to develop knowledge, specifications and guidelines to scale AI solutions with the help of shared datasets, testing and simulation environments, collaborative sandboxes, AI models and associated software, data discoverability and storage and computing resources.

[ITU-T and WSIS](https://www.itu.int/en/ITU-T/wsis/Pages/default.aspx)

As the UN specialized agency for ICTs, ITU was proud to have played the leading role in the organization of the [World Summit on the Information Society (WSIS)](https://www.itu.int/wsis/index.html).

[ITU/WMO/UNESCO-IOC Joint Task Force on SMART cable systems](https://www.itu.int/en/ITU-T/climatechange/task-force-sc/Pages/default.aspx)

ITU, the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO-IOC), and the World Meteorological Organization (WMO) established the Joint Task Force (JTF) on SMART cable systems in 2012, dedicated to advancing the concept of ‘Science Monitoring And Reliable Telecommunications (SMART) cables’. The minimum set of requirements established by the JTF are now feeding into ITU-T standardization work, with two new work items established in 2021 on SMART submarine cable systems ([G.smart](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17089)) and dedicated scientific sensing submarine cable system ([G.dsssc](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17090)).

[Memorandum of Understanding and Cooperation Agreements](https://www.itu.int/en/ITU-T/extcoop/Pages/mou.aspx)

Several MoU and Cooperation Agreements were signed in the study period and details are listed below:

* [**MoU between Organization for International Economics Relations (OiER) and the International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/MoU_ITU_OIER.pdf)

08 September 2021: The MoU between Organization for International Economics Relations (OiER) and ITU highlights the mutual commitment of both organizations to support cities worldwide in leveraging Information Communication Technologies (ICTs) and emerging technologies to help cities become smarter and more sustainable leveraging the excellent work carried out within the United for Smart Sustainable Cities (U4SSC) Initiative.

* [**Cooperation Agreement between the United Nations Human Settlements Programme ("UN-Habitat") and the International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/UNHabitat-ITU-MOU-20201031.pdf)

31 October 2020: The MoU between UN-Habitat and ITU highlights the mutual commitment of both organizations to collaborate in support of the innovation required to achieve the New Urban Agenda and the United Nations Sustainable Development Goals (SDGs) with a special focus on digital transformation of cities and communities.

* [**Memorandum of Understanding between the Brazilian Network Information Centre ("NIC.br") and the International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/Nic.br-ITU-MOU-20200803.pdf)

3 August 2020: The MoU between the Brazilian Network Information Centre and ITU highlights the mutual commitment of both organizations to collaborate and carry out awareness-raising, research and dissemination activities on the topic of Smart and Sustainable Cities.

* [**Cooperation Agreement between The GCC Standardization Organization ("GSO") and the International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/GSO-ITU.pdf)

18 September 2019: the Cooperation Agreement with GSO and ITU has the mandate to establish a high-level, non-exclusive framework for the cooperation between the two organization and to promote the use of ITU Standards taking into account the requirements of the countries members of GSO and to support long term sustainable economic development.

* [**Cooperation Agreement between The African Organisation for Standardization ("ARSO") and the International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/ARSO-ITU.pdf)

20 June 2019: the Cooperation Agreement with ARSO and ITU has the mandate to establish a high-level, non-exclusive framework for the cooperation between the two organization and to promote the use of ITU Standards taking into account the requirements of the African Region to support long term sustainable economic development, as well as facilitating world and regional trade and integration.

* [**Collaboration Arrangements between the International Telecommunication Union ("ITU") and China Academy of Information and Communications Technology ("CAICT")**](https://www.itu.int/en/ITU-T/extcoop/Documents/ca/ITU-CAICT.pdf)

12 June 2019: Collaboration Arrangements to establish a high-level framework of cooperation on ITU’s Smart Incubator Program, for the purpose of promoting telecommunication/ ICT-centric innovation and assisting developing countries in the implementation of ITU-T standards

* [Memorandum of Arrangement between The African Telecommunications Union ("ATU") and the International Telecommunication Union ("ITU") on "Bridging the Standardization Gap"](https://www.itu.int/en/ITU-T/extcoop/Documents/moa/MoA-ITU-ATU-201802.pdf)

12 February 2018: The MoU between ITU and ATU is a high-level framework for cooperation in the implementation of Resolution 44 "Bridging the Standardization Gap"

* [**Cooperation Agreement between The European Committee for Standardization ("CEN"), The European Committee for Electrotechnical Standardization ("CENELEC") And The International Telecommunication Union ("ITU")**](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/CEN-CENELEC-ITU.pdf)

29 March 2017: the Cooperation Agreement with the European Committee for Electrotechnical Standardization (CENELEC), the European Committee for Standardization (CEN) and ITU has the intent to cooperate within a high-level, non-exclusive framework in areas of mutual interest such as in standardization activities on IoT and smart sustainable cities, on trust, on privacy-by-design in technical standards, on cybersecurity, and on mobility and Intelligent Transportation System (ITS) communication standards.

* [Memorandum of Arrangement between the International Telecommunication Union ("ITU") and the Arab Information and Communication Technology Organization ("AICTO") on "Bridging the Standardization Gap"](https://www.itu.int/en/ITU-T/extcoop/Documents/moa/MoA-ITU-AICTO-201712.pdf)

11 December 2017: The MoA between ITU and AICTO is a high-level framework for cooperation in the implementation of Resolution 44 (Rev. Hammamet, 2016) of WTSA "Bridging the Standardization Gap"

[Recognized standards-developing organizations (SDOs) under Recs. A.4, A.5 and A.6](https://www.itu.int/en/ITU-T/extcoop/Pages/sdo.aspx)

ITU-T's external cooperation is guided by three ITU-T Recommendations: [ITU-T A.4:](https://www.itu.int/rec/T-REC-A.4) procedures for communicating with forums and consortia, [ITU-T A.5:](https://www.itu.int/rec/T-REC-A.5) making reference to documents from other organizations, [ITU-T A.6:](https://www.itu.int/rec/T-REC-A.6) cooperation and exchange of information with national and regional SDOs.

# 6 Conformity and interoperability programme

The [ITU Conformity and Interoperability programme](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx) aims to enhance the conformity and interoperability of ICT products implementing ITU-T Recommendations or part thereof, solicit feedback to improve the quality of ITU-T Recommendations, and reduce the digital divide and standardization gap by assisting developing countries with human resource and infrastructure capacity building. The programme is organized in accordance with the ITU Plenipotentiary Conference [Resolution 177](https://www.itu.int/pub/S-CONF-ACTF-2018).

The main objective of [ITU-T Conformity Assessment Steering Committee (CASC)](https://www.itu.int/en/ITU-T/studygroups/2013-2016/11/Pages/CASC.aspx) is to set up criteria, rules and procedures to recognize Test Laboratories (TL) with competence in ITU-T Recommendation(s) and register these TLs in a list of ITU-recognized TLs. This work is supported by a guideline "Testing laboratories recognition procedure" agreed by ITU-T SG11 in 2015.

The [ICT product conformity database](http://www.itu.int/net/itu-t/cdb/ConformityDB.aspx) enables industry to publicize the conformance of ICT products and services to ITU-T Recommendations, assisting users in their efforts to select standards-compliant products. The database currently contains more than 500 entries. Five categories of products and services have been submitted to the database:

* **e-Health** solutions complying with the specifications of ITU-T H.810 "Interoperability design guidelines for personal health systems", a transposition of the Continua Design Guidelines. The testing procedures are specified in the ITU-T H.820-H.850 sub-series of Recommendations.
* **Mobile phones** compatible with Bluetooth-enabled vehicle hands-free terminals. This compatibility is determined in accordance with the 'Chapter 12 tests' ("Verification of the transmission performance of short-range wireless (SRW) transmission enabled phones") of ITU-T P.1100 and ITU-T P.1110.
* **Ethernet** products complying with ITU-T G.8011/Y.1307 "Ethernet Services Characteristics". This standard as well as the corresponding tests are based on the work of MEF (formerly called Metro Ethernet Forum).
* **IPTV systems** compatible with ITU-T H.721 "IPTV terminal devices: Basic model" and ITU-T H.702 "Accessibility profiles for IPTV systems", tested to [HSTP-CONF-H721](http://www.itu.int/pub/T-TUT-IPTV-2015-H721) and [HSTP-CONF-H702](http://www.itu.int/pub/T-TUT-IPTV-2017-H702).
* **Mobile Number Portability (MNP)** systems compatible with ITU-T Q.Supplement 4 "Number portability – Capability set 1 requirements for service provider portability (All call query and Onward routing)", tested to ITU-T Q.3905.

# 7 Mainstreaming accessibility

ITU works to increase access to ICTs for persons with disabilities: by raising awareness of their right to access ICTs; mainstreaming accessibility in the development of international ICT standards; and providing education and training on key accessibility issues.

ITU offers an advocacy platform with global reach ([ITU and Accessibility](https://www.itu.int/en/action/accessibility/Pages/hlmdd2013.aspx)). The ITU secretariat oversees the accessibility work undertaken across ITU’s three sectors, thereby ensuring the efficient coordination of activities carried out in the spheres of radiocommunication ( [ITU-R and Accessibility](https://www.itu.int/ITU-R/index.asp?category=information&rlink=disabilities-divide&lang=en)), standardization ([ITU-T and Accessibility](https://www.itu.int/en/ITU-T/accessibility/Pages/default.aspx)), and development ([ITU-D and Accessibility](https://www.itu.int/en/ITU-D/Digital-Inclusion/Pages/default.aspx)).

The [Joint IEC/ISO/ITU Policy Statement on Standardization and accessibility](http://www.worldstandardscooperation.org/accessibility/) highlights the three international SDOs' commitment to the development of standards that take account of the widest range of characteristics and abilities of persons, including in particular those of older persons, children and persons with disabilities.

## 7.1 Platforms to advance accessibility

* [Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF)](https://www.itu.int/en/ITU-T/jca/ahf/Pages/default.aspx) acts as the first point of contact for those interested in ITU’s accessibility-related activities, with its chief responsibility being the coordination of accessibility work undertaken within ITU (across ITU-R, ITU-T and ITU-D) and in concert with other United Nations organizations, activities and specialized agencies, ISO, IEC, regional and national SDOs, industry groups, academia, disability organizations and telecommunication user groups for persons with disabilities. Reporting to TSAG, JCA-AHF works to ensure a comprehensive approach to accessibility in close collaboration with ITU’s various expert groups, especially Q24/16 and Q26/16 in ITU-T SG16, and Question 7/1 in ITU-D SG1.
* [IRG-AVA - Intersector Rapporteur Group Audiovisual Media Accessibility](https://www.itu.int/en/irg/ava/Pages/default.aspx) studies topics related to audiovisual media accessibility and aims at developing draft Recommendations for "Access Systems" that can be used for all media delivery systems, including broadcast, cable, Internet, and IPTV. The IRG also addresses matters contributing to the coordination of the standardization work of the involved ITU-T and ITU-R groups and collaborates with other SDOs and other audiovisual media organizations (e.g., forums and consortia, research institutes and academia).
* [ITU-T Study Group 16 (Multimedia)](https://www.itu.int/en/ITU-T/studygroups/2013-2016/16/Pages/default.aspx) is the lead ITU study group on telecommunication/ICT accessibility for persons with disabilities and it works to mainstream the consideration of accessibility in the development of multimedia standards, technologies and services. SG16 organizes accessibility work under Q24/16 (continuation of ITU-T Q4/2) "Human factors related issues for improvement of the quality of life through international telecommunications" and Q26/16 "Accessibility to multimedia systems and services".
* [Dynamic Coalition on Accessibility and Disability (DCAD)](https://www.itu.int/themes/accessibility/dc)is a body that works to ensure that ICT accessibility is included in discussions related to Internet governance. DCAD came into being at the 2007 annual Internet Governance Forum ([IGF](http://www.intgovforum.org/cms/)) and remains a crucial mechanism to ensure that persons with disabilities are consulted and included in meetings of the IGF.

## 7.2 Basic tools for standards developers and meeting organizers

* [Telecommunications Accessibility Checklist:](https://www.itu.int/publ/T-TUT-FSTP-2006-TACL/en) this checklist assists experts developing technical standards to ensure that they are taking into account the needs of those to whom accessibility to ICTs are restricted.
* [ITU-T F.791 (11/2015) "Accessibility terms and definitions](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=12624&lang=en)": This is the first consented UN standalone recommendation giving the correct definitions based on the United Nations Convention on the Rights of Persons with Disabilities with consultation with persons with disabilities to be used by standard writers and others to be used in all respective documents in English.
* [ITU-T F.790 (01/2007) "Telecommunications accessibility guidelines for older persons and persons with disabilities](https://www.itu.int/rec/T-REC-F.790-200701-I/en)" (under revision): this Recommendation gives guidance on understanding the topic of accessibility and the ways that accessibility may be incorporated in ICT products and services.
* [FSTP-ACC-RemPart (10/2015) "Guidelines for supporting remote participation in meetings for all"](https://www.itu.int/dms_pub/itu-t/opb/tut/T-TUT-FSTP-2015-ACC-PDF-E.pdf)
* [FSTP-AM (10/2015) "Guidelines for accessible meetings"](https://www.itu.int/pub/T-TUT-FSTP-2015-AM)

# 8 Intellectual property rights

The [TSB Director's Ad Hoc Group on Intellectual Property Rights (IPR AHG)](http://www.itu.int/en/ITU-T/ipr/Pages/adhoc.aspx) continues its work to protect the integrity of the standards-development process by clarifying aspects of the [ITU-R/ITU-T/ISO/IEC Common Patent Policy and related Guidelines](http://www.itu.int/en/ITU-T/ipr/Pages/revpatent.aspx) – the Union's main tool to manage the challenges associated with the incorporation of patents in [ITU-T and ITU-R Recommendations](http://www.itu.int/en/ITU-T/publications/Pages/recs.aspx). Meeting reports are available [here](https://www.itu.int/oth/T0402/en).

All patent declarations received are listed on ITU’s website. See the [ITU-T IPR database](https://www.itu.int/net4/ipr/search.aspx).

Two joint ITU-NGMN workshops on intellectual property rights were held in the study period:

* [Joint ITU-NGMN conference on Licensing practices in 5G industry segments​](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/itu-ngmn/Pages/20190129.aspx)
Geneva, Switzerland, 29-30 January 2019.
* [2nd joint ITU-NGMN Alliance workshop on Open Source and Standards for 5G](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/itu-ngmn/Pages/20170111.aspx)
Bellevue, USA, 1 November 2017.

# 9 Membership

ITU-T membership maintains stable growth. ITU-T now hosts 269 Sector Members and 221 Associates, as compared to 252 Sector Members and 127 Associates in 2016. ITU Academia members now total 161, with this figure standing at 103 in 2016. 43 of ITU-T's Associates are now participating under the reduced fee structure for small and medium-sized enterprises (SMEs) which came into effect on 31 January 2020.

**Total ITU-T Sector Members, Associates and Academia (31 December 2009 – 31 December 2021):**

The following table and figure illustrate the evolution of ITU-T membership from 31 December 2009 to 31 December 2021 (noting that the Academia membership category opened in 2011).

|  | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sector Members | 290 | 259 | 261 | 265 | 272 | 270 | 264 | 252 | 257 | 256 | 265 | 273 | 269 |
| Associates | 101 | 110 | 118 | 127 | 129 | 131 | 131 | 127 | 134 | 153 | 179 | 195 | 221 |
| Academia | ‑ | ‑ | 23 | 40 | 58 | 72 | 94 | 103 | 119 | 147 | 156 | 161 | 161 |
| TOTAL | 391 | 369 | 402 | 432 | 459 | 473 | 489 | 482 | 510 | 556 | 600 | 629 | 651 |

NOTE – Some of the figures in the table above have been subject to retroactive changes

**Figure 5 – Evolution of ITU-T membership from 31 December 2009 to 31 December 2021**

NOTE – The Academia category was created in 2011.

## 9.1 Evolution of ITU-T membership

New ITU-T members include companies in energy and utilities, shipping and logistics, fintech, over-the-top applications, automotive, IoT/M2M connectivity, distributed ledger technologies, quantum information technology, AI/ML, unmanned aerial vehicles, space services, smart city applications, esports, and light communications (LiFi).

For a listing of all ITU members, including ITU Academia members, see relevant [web page](https://www.itu.int/hub/membership/our-members/).

ITU-T welcomed ten new Sector Members and 33 new Associates in 2021, resulting in a net increase of 22.

ITU-T welcomed nine new Sector Members and 34 new Associates in 2020, resulting in a net increase of 24.

ITU-T welcomed 20 new Sector Members and 34 new Associates in 2019, resulting in a net increase of 35.

ITU-T welcomed 14 new Sector Members and 31 new Associates in 2018, resulting in a net increase of 18.

ITU-T welcomed nine new Sector Members and 21 new Associates in 2017, resulting a net increase of 12.

## 9.2 Smart Incubator Programme

In response to the joint invitation sent by TSB and BDT to invite interested ITU Member States to nominate a candidate Knowledge and Implementation Partner, the Smart Incubator Programme launched officially in 2021.

The programme has welcomed new start-ups as well as returning ones, looking to improve their skills. In that regard, the Smart Incubator secretariat held an Advanced Information Management and Security System training from 2 to 6 August 2021 to help with the skills needed for each start-up to fulfil their objectives within the Smart Incubator Programme. The World Intellectual Property Organization (WIPO) as a partner also kindly hosted an Intellectual Property training on 22 June 2021. The Smart Incubator secretariat is now focusing on each start-up’s specific need, and how to best help them achieve their goals.

Start-ups and SMEs benefiting from the programme are listed below.

|  |
| --- |
| **Start-ups/SMEs** |
| Magic View - Netherlands | Winner of Accessible Europe 2021- BDT Competition |
| DocRep - Rwanda | Winner of the 2018 Telecom Award |
| Casual Payroll - Rwanda | Winner of the 2018 Telecom Award |
| Higaneza Ltd - Rwanda | New incoming start-up |

# 10 Virtual meetings

The COVID-19 pandemic has highlighted the value of ITU-T's electronic working environment. Virtual meetings and electronic working methods have come to form the principal platform for ITU standardization work as part of the global response to COVID-19. ITU members engaged in standards development and preparations for WTSA-20 have made optimal use of the personalized [MyWorkspace](https://www.itu.int/net4/ITU-T/myworkspace/) platform and associated TSB services and tools such as MyMeetings.

MyMeetings is the main platform for ITU-T statutory meetings. MyMeetings is also used to host Rapporteur Group Meetings and non-statutory events, such as webinars. MyMeetings features important elements found in ITU-T physical meetings, including participants’ list and affiliation, multilingual support, moderated floor request and captioning. Several layers of access control ensure that only registered participants gain access to statutory meetings.

Other electronic meeting tools, such as Zoom, are also provided by TSB for hosting virtual meetings and any on-demand ad-hoc meetings.

Statistics on e-meetings for the study period are shown below.

* 2017: 1,072 e-meetings; 5,254 attendees
* 2018: 1,558 e-meetings; 8,353 attendees
* 2019: 2,110 e-meetings; 17,657 attendees
* 2020: 4,220 e-meetings; 77,693 attendees
* 2021: 4,671 e-meetings; 87,302 attendees



Figure 6 – Remote participation and e-meetings

## 10.1 Workshops and symposia

252 ITU-T workshops and symposia were organized in the study period, in addition to the weekly programming of the year-round [AI for Good](https://aiforgood.itu.int/) digital platform. A listing of all past and planned events can be found on the [ITU-T events homepage](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/Pages/default.aspx).

ITU workshops and symposia discuss emerging trends in standardization, increase the visibility of ITU-T work, enhance ITU-T collaboration with other bodies, attract and recruit new ITU-T members, and encourage peer-learning relevant to the development and implementation of international standards.

Participation in ITU workshops and symposia increased considerably over 2020 and 2021. With all ITU-T workshops and symposia held virtually, open ITU-T events are welcoming a greater number and diversity of participants.

# 11 Bridging the standardization gap

[ITU's Bridging the Standardization Gap (BSG) programme](https://www.itu.int/en/ITU-T/gap/Pages/default.aspx) improves the capacity of developing countries to participate in the development and implementation of international ICT standards.

WTSA-16 agreed an Action Plan to address further the disparity in standardization between developed and developing countries, including least-developed countries, Small Island Developing States (SIDS) and countries with economies in transition.

The revamped BSG Programme is structured around five pillars, responding to WTSA Resolution 44. The five pillars of the BSG programme include: Engagement, know-how, community, awareness, and partnering:

1. **Engagement** is about facilitating participation in standards development. This includes fellowship and mentorship programmes and tools for remote participation.
2. **Know-how** covers the development of skills and capabilities for standards-making. This includes standards-making effectiveness sessions, video tutorials and e-learning courses.
3. **Community** focused on empowerment at regional and national levels. Regional Groups within ITU-T SGs are a prime example, ensuring that standards-making is inclusive of the needs of all regions.
4. **Awareness** covers information sharing, using ITU-T publications on a wide range of topics as well as Regional and Inter-Regional standardization forums.
5. **Partnering** is about mobilizing resources and fostering collaboration.

**BSG hands-on training sessions:** ITU-T regularly carries out "BSG Hands-On SG effectiveness training" in response to WTSA Resolution 44. These trainings focus on the development of practical skills to maximize the effectiveness of developing countries' participation in the ITU-T standardization process, covering topics including strategies for participation in SGs, drafting contributions to meetings, presenting proposals, collaborative working methods, building consensus and utilization of TSB tools and services. Approximately 40 training sessions were held in the study period, welcoming over 1,200 ITU-T delegates.

**BSG training on services and tools:** On occasion, TSB also offers trainings on the use of TSB services and tools. These trainings introduce services and tools including remote participation, MyWorkspace and publications. Such BSG trainings facilitate more active and efficient participation in ITU-T work. For more on TSB services and tools, see [section 14](#_14_Services_and).

**Regional groups:** Regional groups within ITU-T SGs have proven effective mechanisms to coordinate regional contributions to ITU and increase the number and quality of technical contributions from developing countries. Stimulating effective participation in ITU-T SGs, regional groups play a key role in bridging the standardization gap between developed and developing countries.

Over 80 regional group meetings were organized in the study period, with the majority of regional groups continuing to meet virtually throughout the COVID-19 pandemic. An overview of regional groups' activities in the study period can be found [here](https://www.itu.int/en/ITU-T/regional-groups/Pages/default.aspx).

ITU-T hosts 25 regional groups:

* Nine for Africa (SGs 2 (Africa; East Africa), 3, 5, 11, 12, 13, 17, and 20)
* Four for the Americas (SGs 2, 3, 5, and 20)
* Five for the Arab States (SGs 2, 3, 5, 17, and 20)
* Two for Asia and the Pacific (SGs 3 and 5)
* One for Europe and the Mediterranean Basin (SG3)
* Four for Eastern Europe, Central Asia and Transcaucasia (SGs 3, 11, 13, and 20)

**Regional Standardization Forums:** [Regional Standardization Forums (RSFs)](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/Pages/default.aspx) provide tutorials on ITU-T working methods as well as more technically-oriented themes such as human exposure to electromagnetic fields, quality of service, smart water management, international mobile roaming, mobile financial services, digital identity, big data, and security and trust.

RSFs are being held in conjunction with meetings of regional groups to improve the alignment of RSF discussions and the priorities of ITU-T SGs. RSFs are also raising awareness of ITU standardization activities through the participation of key decision-makers (Prime Ministers, Ministers, Heads of Regulators, CEOs, etc.).

11 RSFs, including Inter-regional Standardization Forums, were held in the study period:

* [Inter-regional Standardization Forum on Operational issues on numbering, emergency service and OTTs](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20191022/Pages/default.aspx)
Dubai, United Arab Emirates, 22 October 2019
* [ITU Regional Standardization Forum (RSF) on Addressing Competition Issues in ICT Economy](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201910/Pages/default.aspx)
Colombo, Sri Lanka, 1st October 2019
* [Second Arab-African Interregional Standardization Forum on PKI for e-trust](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/2019040405/Pages/default.aspx)
Tunis, Tunisia, 4-5 April 2019
* [ITU Regional Standardization Forum on Emerging Economic, Regulatory and Policy Trends For an Inclusive, Sustainable and Trustworthy Digital World](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20190218/Pages/default.aspx)
Antananarivo, Madagascar, 18 February 2019
* [ITU Regional Standardization Forum on Emerging Economic, Regulatory and Policy Trends in a Fast-Changing Digital World](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20181217/Pages/default.aspx)
Kuwait City, Kuwait, 17 December 2018
* [ITU Regional Standardization Forum on Emerging Economic, Regulatory and Policy Trends in a Fast-Changing Digital World](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201806/Pages/default.aspx)
X’ian, China, 27 August 2018
* [ITU Regional Standardization Forum on Emerging Economic, Regulatory and Policy Trends in a Fast-Changing Digital World](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20180205/Pages/default.aspx)
Kigali, Rwanda, 5 February 2018
* [First Arab-African Interregional Standardization Forum (ISF) for Bridging the Standardization Gap with a focus on PKI for e-trust in the hyperconnected world](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201712/Pages/default.aspx)
Muscat, Oman, 11-12 December 2017
* [ITU Regional Standardization Forum for Bridging the Standardization Gap (BSG) - Arab Region](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/112017/Pages/default.aspx)
Riyadh, Saudi Arabia, 19 November 2017
* [ITU Regional Standardization Forum for Bridging the Standardization Gap (BSG) - Asia and Pacific Region](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201710/Pages/default.aspx)
Seoul, Korea (Rep. of), 24 October 2017
* [ITU Regional Standardization Forum for Bridging the Standardization Gap (BSG) - the Americas Region](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201703/Pages/default.aspx)
Port of Spain, Trinidad and Tobago, 6 March 2017

Under the same umbrella, three workshops focused on BSG were held in the study period:

* [BSG Interactive Workshop on Effectiveness in Standardization](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20190327/Pages/default.aspx)
Managua, Nicaragua, 27 March 2019
* [The BSG Session on IoT](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20180506/Pages/default.aspx)
Cairo, Egypt, 6 May 2018
* [BSG Interactive Workshop on Effectiveness in Standardization](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/20180506/Pages/default.aspx)
Tunis, Tunisia, 24 April 2018

**National Standardization Secretariates:** ITU-T's [new Guidelines for National Standardization Secretariats (NSS)](https://www.itu.int/en/ITU-T/gap/Documents/nss-rep-may.pdf) take into account the membership feedback on the Guidelines first published in 2014. The Guidelines set out a number of options for developing national procedures and processes to support effective participation in the ITU-T standards-development process. An NSS, as described by the Guidelines, is the full set of arrangements by which participation in and contributions to ITU-T are coordinated within a country.

An extensive set of functions that an NSS could perform are presented, enabling a country to select functions and organizational arrangements in a modular fashion, considering factors such as its ICT standardization policies; the number and type of organizations with an interest in ICT standardization in the country (e.g., number of service providers, equipment manufacturers, and academic and research institutes); and the level of participation in ITU-T SGs (e.g., whether as an initiator of work items, active contributor or observer in one or more ITU-T SGs).

**e-Learning courses:** One of the BSG measures adopted under WTSA Resolution 44 calls for the exploration of e-learning channels for training on ITU-T Recommendations. These training courses are available on the ITU Academy website at <http://academy.itu.int>.

**SG mentoring programme:** In 2011, a mentoring programme for ITU-T SGs was introduced. The objective of the mentoring programme is to provide a contact point to assist new delegates with the working methods of ITU-T and to facilitate participation and contributions from developing countries. It has since featured as an important part of the work of ITU-T SGs and TSAG.

**Technical papers:** A series of Technical Papers and Technical Reports provide additional information for developing countries on best practices in implementing ITU-T Recommendations. See the Technical Reports [web page](https://www.itu.int/pub/T-TUT).

**Fellowships:** Fellowships provide financial support to ITU-T delegates from eligible developing countries to assist their participation in ITU-T meetings. No fellowships are currently being awarded in the virtual meeting environment called for by the COVID-19 pandemic.

746 fellowships were awarded in the study period prior to the shift to virtual meetings from 12 March 2020. The figures below illustrate the distribution of awarded fellowships by region and gender.

**Figure 7 – Awarded fellowships by region**

**Figure 8 – Awarded fellowships by gender**

# 12 Gender

TSB continues its efforts to include a gender perspective in all of its activities and programmes under the umbrella of the ITU Gender Task Force. In alignment with WTSA Resolution 55 (Rev. Hammamet, 2016), TSB continues to undertake actions to improve gender equality in TSB and ITU-T. Diversity of staff, gender equality and the empowerment of women continue to be among TSB's priorities.

The figures below provide an overview of selected TSB/ITU-T activities with respect to participants' gender.

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Figure 9.1, 9.2 and 9.3 – Participation in statutory events by study period and gender





Figures 10.1 and 10.2 – Overall and speaker participation in AI for Good activities in study period by gender





Figures 11.1 and 11.2 – Overall and speaker participation in smart cities and climate change activities in the study period by gender





Figures 12.1 and 12.2 – Overall and speaker participation in intelligent transport systems (ITS) activities in the study period by gender



Figure 13 – Share of ITU-T leadership positions in the study period by gender



Figure 14 – Share of fellowships in the study period by gender

|  |  |  |
| --- | --- | --- |
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Figures 15.1, 15.2 and 15.3 – TSB staff positions by gender, overall, in the professional and director service categories, and in the general service category

# 13 Publications

## 13.1 Recommendations and Supplements

Over 103,000 pages of ITU-T Recommendations and Supplements were published in the study period. Figure 16 illustrates the number of ITU-T Recommendations and Supplements published per year since 2016.

All major editions of ITU-T Recommendations continue to be converted to the reflowable ePub format, and are published for free download alongside the usual PDF format. The ePub format allows users to read the Recommendations on devices of different screen sizes, and also to apply functions such as bookmarks, notes and highlights.

As approved by TSAG, most corrigenda and amendments to ITU-T Recommendations are now integrated into the main edition. The changes introduced by the amendment or corrigendum are shown with revision marks.

The ITU product "ITU-T Recommendations and selected Handbooks" continues to be distributed on a quarterly basis as a USB key. This product represents a tool of great value to standards developers and implementers as a consolidated archive of the over 4,000 ITU-T standards in force.



**Figure 16 – Number of Recommendations, amendments and Supplements**
**published per year since 2016**

## 13.2 Official languages of the Union on an equal footing

The Standardization Committee for Vocabulary (SCV), composed of ITU-T members expert in all the official languages, serves as focal point to ITU-T SGs in terminology-related matters. SCV guides the adoption of terms and definitions in ITU-T Recommendations in accordance with WTSA Resolution 67.

TSB continues to collect all new terms and definitions proposed by ITU-T SGs, entering them into the online ITU Terms and Definitions database.

As requested by WTSA Resolution 67, TSB continues to translate all Recommendations approved under the Traditional Approval Process (TAP) as well as all TSAG reports.

TSB also translated 129 Recommendations approved under the Alternative Approval Process (AAP) in the study period, in accordance with requests received from ITU-T SGs and linguistic groups, and within the available budget.

# 14 Services and tools

Electronic working methods offer crucial support to members engaged in ITU-T standardization work. TSB is continuously developing new applications and services, while enhancing existing services, to maintain and expand ITU-T's advanced electronic working environment.

## 14.1 ITU-T databases

Following databases are made available for ITU-T delegates and secretariat staff:

* [ITU-T Work Programme](http://www.itu.int/ITU-T/workprog)
* [ITU-T A.4, A.5 and A.6 recognized organizations](https://www.itu.int/en/ITU-T/extcoop/Pages/sdo.aspx)
* [ITU-T AAP](https://www.itu.int/ITU-T/aap/AAPSearch.aspx) & [TAP](https://www.itu.int/net/ITU-T/lists/t-approval.aspx)
* [ITU-T Recommendations](http://www.itu.int/itu-t/recommendations)
* [ITU-T Liaison Statements](https://www.itu.int/net/itu-t/ls/ils.aspx?to=3936&meeting=T17-TSAG-211025)
* [ITU-T Patents and Software Copyrights](http://www.itu.int/ipr/)
* [ITU Product Conformity Database](http://www.itu.int/net/itu-t/cdb/ConformityDB.aspx)
* [ITU-T Formal Descriptions and Object Identifiers](http://www.itu.int/ITU-T/formal-language/index.html)
* [ITU-T Test Signals](http://www.itu.int/net/itu-t/sigdb/menu.htm)
* [ITU-T Terms & Definitions](http://www.itu.int/ITU-R/go/terminology-database)
* [International Numbering Resources](http://www.itu.int/ITU-T/inr/index.html) (See section 10.6 for more details)
* [ICT standards landscape](https://www.itu.int/net4/ITU-T/landscape):
	+ Access Network Transport Standards
	+ Cloud Computing
	+ Home Network Transport Standards
	+ ICT Security Standards
	+ IMT-2020 and beyond (and Software-Defined Networking)
	+ IoT & Smart Sustainable Cities Standards
	+ ITS Communication Standards.

## 14.2 MyWorkspace

[MyWorkspace](https://www.itu.int/myworkspace/) is a user-friendly mobile platform that centralizes a set of applications and services developed to strengthen electronic working methods for the work of ITU-T, as stated in WTSA Resolution 32. Since the first version was released in 2017, more than 4000 users have visited it, with an average of 500 visits per month. Secure access to MyWorkspace is enabled through ITU User Account (TIES) credentials.

The following applications and services are available in MyWorkspace:

* [ITU Translate](https://www.itu.int/myworkspace/#/Translate): Machine translation tool based on neural network, trained in-house on ITU documents official translations and supporting all six (6) UN official languages.
* [MyMeetings](https://www.itu.int/myworkspace/#/MyMeetings): Remote participation service based on an open-source solution and customized in-house to support requirements of both statutory and non-statutory ITU-T meetings.
* Documents:
	+ - [MyDocuments](https://www.itu.int/myworkspace/#/Documents/MyDocuments/meeting=T17-TSAG-211025&search=&type=&sources=&questions=): Simplified access to Study Group documents, per meeting, with multiple sorting and selection filters and full text search, and automatic translation from English into 5 others official ITU languages (available on request).
		- [Suggested documents](https://www.itu.int/myworkspace/#/Documents/Suggested-Documents): A proposed list of documents based on pre-set user interests, with the option to bookmark favourites.
* [Calendar](https://www.itu.int/myworkspace/#/Calendar): Monthly calendar view of all ITU events with filters on ITU sectors and ITU-T working groups, with detailed information.
* [MyEvents](https://www.itu.int/myworkspace/#/Myevents): Events management platform, which provides real time ITU-T events agenda, list of registered participants, speakers and exhibitors, as well as a ‘matchmaking’ function to enable networking among participants.
* [Mailing list](https://www.itu.int/myworkspace/#/Mailing): Subscription management with search functionality.
* [Community](https://www.itu.int/myworkspace/#/Community): MyWorkspace user’s directory.
* [ITU-T Cloud](http://tsbcloud.itu.int): ITU premises storage service allowing users to share and exchange up to 10 GB of files per user.
* [Profile](https://www.itu.int/myworkspace/#/profile): User personal information and interests.

## 14.3 ITU-T services & tools

The [Electronic Working Methods (EWM) webpage](https://www.itu.int/en/ITU-T/ewm/Pages/default.aspx) keeps the ITU-T community up to date with the latest available tools and service enhancements, which it now summarises more clearly. The [Announcements and Updates webpage](https://www.itu.int/en/ITU-T/ewm/Pages/EWM-Updates.aspx) now regularly presents service changes. The Electronic Working Methods section of the [ITU-T Resources webpage](https://www.itu.int/en/ITU-T/info/Pages/resources.aspx) provides more useful links to the most common tools.

## 14.4 Document Management System for Rapporteur Groups

The Microsoft SharePoint-based Document Management System for ITU-T Rapporteur Group Meetings (RGMs) has been used extensively by the majority of ITU-T SGs, notably SGs 2, 3, 9, 11, 13, 15, 16, 17 and TSAG. Feedback from Rapporteurs drives the continuous improvement of the RGM system.

Current and past RGM meetings can be accessed at <http://itu.int/go/itu-t/rgm>

A comprehensive support and FAQs page offering RGM tips and best practices is available at <http://itu.int/go/itu-t/rgm-support>

A detailed online user guide for the RGM System, including video tutorials, is available at <http://itu.int/go/itu-t/rgm-guide>

The RGM system is one of several services available in the ITU-T SharePoint collaboration sites. These sites are restricted to ITU-T members and can be accessed using an ITU User Account (TIES).

## 14.5 International Numbering Resources

ITU assigns about two-dozen types of International Numbering Resources (INRs), either directly or indirectly.

Notifications of national numbering/identification plan updates and assignments or reclamations of national numbering/identification resources are received and published in the [ITU Operational Bulletin](http://www.itu.int/pub/T-SP-OB). The ITU Operational Bulletin is published in the six official languages of the Union twice a month. Some 20 annexes are maintained on numbers and codes allocated in accordance with the following recommendations:

* [ITU-T E.164 "The international public telecommunication numbering plan"](https://www.itu.int/itu-t/recommendations/rec.aspx?rec=10688)
* [ITU-T E.118 "The international telecommunication charge card"](https://www.itu.int/itu-t/recommendations/rec.aspx?rec=8728)
* [ITU-T E.212 "The international identification plan for public networks and subscriptions"](https://www.itu.int/itu-t/recommendations/rec.aspx?rec=12831)
* [ITU-T E.218 "Management of the allocation of terrestrial trunk radio Mobile Country Codes"](https://www.itu.int/itu-t/recommendations/rec.aspx?rec=7148)
* [ITU-T Q.708 "Assignment procedures for international signalling point codes"](https://www.itu.int/itu-t/recommendations/rec.aspx?rec=4591)

## 14.6 ITU-T SharePoint collaboration sites

The ITU-T SharePoint collaboration sites enable participants in ITU-T working groups to conduct online discussions, work on projects, schedule meetings and manage and store documents in a secure shared environment.

The home of ITU-T SharePoint collaboration sites can be accessed at: <https://extranet.itu.int/sites/ITU-T/>.

A selection of notable collaboration sites is listed below:

* ITU-T SGs (Study Period 2017-2021) (<https://extranet.itu.int/sites/itu-t/studygroups/2017-2020>)
* United for Smart Sustainable Cities (U4SSC) (<https://extranet.itu.int/sites/itu-t/initiatives/U4SSC/>)
* Security, Infrastructure and Trust Working Group (SIT WG) (<https://extranet.itu.int/sites/itu-t/initiatives/sitwg/>)
* FG-AI4AD – ITU-T Focus Group on Autonomous and Assisted Driving (<https://extranet.itu.int/sites/itu-t/focusgroups/ai4ad>)
* FG-AI4EE – Focus Group on Environmental Efficiency for AI and other Emerging Technologies
(<https://extranet.itu.int/sites/itu-t/focusgroups/ai4ee/>)
* FG-AI4H – ITU-T Focus Group on AI for Health (<https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/>)
* FG-AN – ITU-T Focus Group on Autonomous Networks (<https://extranet.itu.int/sites/itu-t/focusgroups/an/SitePages/Home.aspx>)
* FG-AI4NDM – ITU-T Focus Group on Artificial Intelligence for Natural Disaster Management (<https://extranet.itu.int/sites/itu-t/focusgroups/ai4ndm/SitePages/Home.aspx>)
* FG-QIT4N – ITU-T Focus Group on Quantum Information Technology for Networks (<https://extranet.itu.int/sites/itu-t/focusgroups/qit4n>)
* FG-VM – ITU-T Focus Group on Vehicular Multimedia
(<https://extranet.itu.int/sites/itu-t/focusgroups/vm/>)
* JVDS – ITU-T SG16 & ISO TC22/SC31/WG8 Joint Project Team on Vehicle Domain Service (<https://extranet.itu.int/sites/itu-t/jointgroups/jvds/>)
* IRG-AVA - Intersector Rapporteur Group on Audiovisual Media Accessibility (<https://extranet.itu.int/sites/irg/ava/>)
* CASC – ITU-T Conformity Assessment Steering Committee
(<https://extranet.itu.int/sites/itu-t/studygroups/2017-2020/sg11/casc/>)
* Pathway #1: Circular Design (<https://extranet.itu.int/sites/itu-t/initiatives/circulardesign>)
* Digital Currency Global Initiative (<https://extranet.itu.int/sites/itu-t/initiatives/dcgi>)
* Project on E-waste (<https://extranet.itu.int/sites/itu-t/initiatives/E-waste>)
* Focal points and coordinators for WTSA-20 from regional organizations (<https://extranet.itu.int/sites/itu-t/wtsa-20/prepmeet/Lists/ContactSheet/DefViewContacts.aspx>)
* [Numbering Applications Monitor](https://extranet.itu.int/sites/itu-t/studygroups/2017-2020/sg2/SitePages/Numbering%20Applications%20Monitor.aspx)

A support site containing a knowledge base of FAQs and user guides on the various SharePoint services is available at: <https://extranet.itu.int/ITU-T/support/>.

Most of the collaboration sites are restricted to ITU-T members, accessed using an ITU User Account (TIES). Certain collaboration sites are open to non-members, accessed using non-member ITU User Accounts.

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