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| **Abstract:** | This TD contains the Lead SG report for ITU-T SG16 since last TSAG meeting. |

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# Lead SG roles

ITU-T SG16 is responsible for studies relating to ubiquitous multimedia applications, multimedia capabilities for services and applications for existing and future networks. This encompasses accessibility; multimedia architectures and applications; human interfaces and services; terminals; protocols; signal processing; media coding and systems (e.g. network signal processing equipment, multipoint conference units, gateways and gatekeepers).

ITU-T Study Group 16 performs on the following lead SG roles (WTSA-20 Res.2):

– multimedia technologies, applications, systems and services

– IP-based television services and digital signage

– human factors and ICT accessibility for digital inclusion

– multimedia aspects of automotive-related intelligent services

– multimedia aspects of digital health

– digital culture

– multimedia aspects of distributed ledger technology (DLT) and its applications

In addition to being the parent of the new JCA on multimedia aspects of e-services, ITU-T Study Group 16 also had active participation in the JCA-AHF [Joint Coordination Activity on Accessibility and Human factors](http://www.itu.int/ITU-T/jca/ahf/index.html)

The Study Group also coordinates its activities with a number of external players, there including:

* ITU-T SG9
* ITU-T SG12
* ITU-R and ITU-D study groups
* ISO/IEC JTC1
* ISO/IEC JTC1 SC29 and its Working Groups (MPEG, WG1/JPEG and WG5/JVET)
* Focus Groups (FG-AI4A, FG-AI4H, FG-AI4NDM, FG-AN, FG-TBFxG).
* Intersector Rapporteur Groups (IRG-AVA)
* WHO
* Various disability organizations within the scope of Study Group 16's accessibility work.

# Recent results

ITU-T SG16 met once since the last TSAG meeting, and held no Working Party:

* SG16, Rennes, 15-26 April 2024

The list below is a summary of the results, in line with the SG16 mandate and lead SG roles (all TD references are SG16 TDs, except where otherwise noted):

* **WTSA-24**: Discussions on the preparations for WTSA-24 completed under the SG16 ad hoc group of the plenary on WTSA-24 preparations (AHG-WTSA24). The text of the current SG16 mandate was updated [[SG16-TD243/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0243)] as well as the text of the existing Questions [[SG16-TD244/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0244), [SG16-TD245/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0245), [SG16-TD246/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0246), [SG16-TD247-R1/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0247)], in particular to include metaverse study items and tasks that were pending guidance from TSAG. A proposal to create a new Question on metaverse [[SG16-TD248/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0248)] was not agreed (see metaverse discussions bullet, below). The group was briefed on the consensus in TSAG that ITU-T SG16 would be consolidated with [ITU-T SG9](https://www.itu.int/en/ITU-T/studygroups/2022-2024/09) (on broadband cable and TV) as a single group in the next study period (2025-2028); a joint team of SG9 and SG16 management was mandated to develop the terms of reference for the consolidated group.
* **Metaverse:** With the first FG-MV deliverables being approved by TSAG and some delivered to SG16, the mandate of the SG and Questions were updated to include metaverse study areas and tasks. In addition, one of the deliverables was approved as technical paper and one new work item was established based on the deliverables. SG16 also provided feedback to TSAG on interest concerning other deliverables (present and future), as found in [[SG16-LS153](https://www.itu.int/net/itu-t/ls/ls.aspx?isn=30209)]. The text of a proposed (but not agreed) Question on metaverse cross-platform interoperability in multimedia aspects was also shared with TSAG, for advice. SG16 also created an [ad hoc group of the plenary on metaverse](https://itu.int/en/ITU-T/studygroups/2022-2024/16/Documents/docs/MV-AHG-ToR-20240426.pdf) (AHG-MV) to help progress the metaverse standardization work in the study group between this and the next meeting [[SG16-TD216-R2/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0216" \t "_parent)] (mailing list [message](mailto:t22sg16ahgmv@lists.itu.int) / [subscription](https://itu.int/go/tsg16/services) / [archive](https://www.itu.int/ml/lists/arc/t22sg16ahgmv); [IFA](https://www.itu.int/ifa/t/2022/sg16/exchange/plen/ahgmv/)).
* **Focus groups:** The final report of the Focus Group on AI for health (FG-AI4H) was reviewed, with the list of 36 approved deliverables. It concluded activities on 30 September 2023, after its last meeting in Geneva, 3-5 July 2023. Questions 5/16 and 28/16 will review the deliverables for possible transposition as ITU-T SG16 deliverables. The results of the FG-AI4H will be used as foundation for the ITU, WHO and WIPO Global Initiative on AI for Health being put into place [[SG16-TD202/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0202), [SG16-TD203/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0203)]. No other FGs remain under SG16, after closure in September 2022 of [FG-VM](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx) (on vehicular multimedia) and [FG-AI4AD](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx) (on AI for autonomous and assisted driving).
* **Video, image and signal coding standards:** At this meeting, a call for proposals for a new standard in collaboration with DICOM was launched towards a specification for coding of biomedical and possibly other general waveform signals [[SG16-TD285/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0285)], ITU-T H.BWC.

Image compression collaboration with JPEG (JTC1/SC29/WG1) continued, with the start of approval process for one common text:

* ITU-T T.800 V4 | ISO/IEC 15444-1 V5 "Information technology – JPEG 2000 image coding system: Core coding system" (Rev.) [[SG16-TD257/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0257)]

For video compression work, collaboration continued within the context of the [JVET](https://www.itu.int/en/ITU-T/studygroups/2022-2024/16/video/Pages/jvet.aspx), with the start of approval process for the following twin texts:

* ITU-T H.264 (V15) "*Advanced video coding for generic audiovisual services*" (Rev.) [[SG16-TD276/Plen](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0276)]
* ITU-T H.265 (V10) "*High efficiency video coding*" (Rev.) [[SG16-TD279/Plen](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0279)]
* ITU-T H.266.2 (V2) "*Reference software for ITU-T H.266 versatile video coding*" (Rev.) [[SG16-TD278/Plen](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0278)]
* ITU-T H.273 (V4) "*Coding-independent code points for video signal type identification*" (Rev.) [[SG16-TD283/Plen](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0283)]
* **Safe listening:** A [workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2024/0416/Pages/default.aspx) was held to progress the work of draft new ITU-T H.SL-ES addressing safe listening in video gaming and esports, with the participation of a wide range of stakeholders. Work completed on the new WHO-ITU Technical Paper HSTP-SLD-Venue "Guideline on safe listening at venues and events" [[SG16-TD219/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0219)] and on revised HSTP-CONF-H870 with the procedures for testing of personal audio systems for compliance with ITU-T H.870 V2 [[SG16-TD220/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0220)].
* **Accessible telehealth:** The technical paper FSTP-CONF-F.780.2 with the conformance testing specification for ITU-T F.780.2 on requirements for accessible telehealth services was completed [[SG16-TD250/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0250)].
* **Digital health:** Two Recommendations and one Technical Paper were completed:
* ITU-T F.781.1 (ex F.Med-Data-QC) "General framework of quality control of medical images for machine learning applications" (New) [[SG16-TD217/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0217)]
* ITU-T F.781.2 (ex H.AI-SaMD-Req) "Quality assessment requirements for artificial intelligence/machine learning-based software as a medical device" (New) [[SG16-TD218/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0218)]
* FSTP.MED-THS "Outline and elements of basic telehealth services" [[SG16-TD222/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0222)]
* **Intelligent transport systems (ITS) and vehicular multimedia:** While ITU-T [H.552](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=18498) (ex H.VM-VMIA) "*Implementation of vehicular multimedia systems*" [[SG16-R20](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-R-0020)] was approved under TAP, ITU-T [F.749.7](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17610) (ex F.VGP-RDSreqs) "*Requirements for remote driving service based on vehicle gateway platform*" was not approved after consideration of concerns from Members States and it was decided to further study it as a [Technical Report ITU-T FSTR.VGP-RDSreqs](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19420) "Requirements for remote driving service based on vehicle gateway platform" [[SG16-TD282/WP1](http://www.itu.int/md/T22-SG16-240415-TD-WP1-0282)].
* **Civilian unmanned aerial vehicles:** ITU-T [F.749.17](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17592) (ex F.CUAV-MVAreqs) "*Requirements for machine vision-based civilian unmanned aerial vehicle applications*" was not approved after consideration of concerns from Members States and it was decided to further study it as a [Technical Report ITU-T FSTR.CUAV-MVAreqs](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19421) "Requirements for machine vision-based civilian unmanned aerial vehicle applications" [[SG16-TD281/WP1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-WP1-0281)]. Work was completed on:
  + ITU-T F.749.18 (ex F.CUAV-ES) "Framework and requirements for emergency services using civilian unmanned aerial vehicles" [[SG16-TD256-R1/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0256)]
* **Digital culture:** Work completed on two new Recommendations:
* ITU-T F.740.8 (ex H.XRLVTArch) "Requirements and architecture for live virtual tour system using panoramic video and augmented reality" (New) [[SG16-TD255-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0255)]
* ITU-T F.743.26 (ex F.DC-CGS-TREC) "Technical requirements of cloud gaming platform based on IMT-2020 mobile edge computing" (New) [[SG16-TD249-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0249)]
* **Content delivery networks (CDNs),** **IPTV and Digital Signage:** At this meeting, TAP Recommendation ITU-T [H.741.5](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17478) (ex H.IPTV-PS) "*Application event handling: Overall aspects of personalized IPTV services*" was approved at the opening plenary [[SG16-R17](https://www.itu.int/md/T22-SG16-R-0017/en)]. Work was completed on three AAP Recommendations:
* ITU-T F.746.18 (ex F.ILMTS-Reqs) "Requirements for interactive low-latency multimedia transmission system over the Internet" (New) [[SG16-TD227/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0227)]
* ITU-T H.705.3 (ex H.IPTV-OpMcast) "Requirements and architecture for open IPTV multicast service" (New) [[SG16-TD229/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0229)]
* ITU-T H.725 (ex H.IPTV-TDES.6) "IPTV Terminal Device: Virtualized model" (New) [[SG16-TD228/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0228)]
* **Video surveillance:** In addition to progressing the current work items on video surveillance and related intelligent and machine vision, work completed on new Recommendation ITU-T F.747.14 (ex F.MFSVreqs) "Requirements and capability framework of the multimodal fusion system for vision" (New) [[SG16-TD221-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0221)].
* **Ubiquitous multimedia applications:** Work started on seven new work items, including H.MMAuth on a framework for verification of multimedia content authenticity [[SG16-TD215-R1/WP1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-WP1-0215)], which can be instrumental in combating fake news and media. Work was completed on six new Recommendations that extend the toolset of SG16 Recommendations for support of multimedia applications and services:
* ITU-T F.743.25 (ex F.MDAM-PR) "Procedures and requirements for multimedia data asset management" (New) [[SG16-TD223-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0223)]
* ITU-T F.747.15 (ex F.EVSreqs) "Requirements of event-based vision systems" (New) [[SG16-TD253/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0253)]
* ITU-T F.748.28 (ex F.DTP-Reqts) "Requirements and functional architecture of digital twin platform for supporting multimedia services" (New) [[SG16-TD226-R2/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0226)]
* ITU-T F.748.29 (ex F.MFDreqs) "Framework and requirements of computer audition based machinery fault diagnosis systems" (New) [[SG16-TD251/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0251)]
* ITU-T H.626.7 (ex H.MVSarch) "Functional architecture for machine vision systems in smart manufacturing" (New) [[SG16-TD224-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0224)]
* ITU-T H.644.8 (ex H.MPSTech) "Requirements and architecture on audio and video processing of media processing services" (New) [[SG16-TD252-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0252)]
* **AI and machine learning:** The multimedia AI topic was very active at this meeting. Approved under TAP new ITU-T [F.748.24](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17619) (ex F.TCEF-FML) "*Trusted contribution evaluation framework on federated machine learning services*" [[SG16-R14](https://www.itu.int/md/T22-SG16-R-0014/en)] at the opening plenary, as well as ITU-T F.748.23 (ex F.ML-ICSMIReqs) "Requirements and framework for intelligent crowdsensing multimedia interaction based on deep learning" after discussion of concerns raised by Member States [[SG16-TD259/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0259)]. In addition to [various ongoing and 12 new work items](https://www.itu.int/ITU-T/workprog/wp_search.aspx?q=5/16), the approval process started for one TAP (\*) and five AAP texts:
* ITU-T F.748.34 (ex F.AI-MKGDS) "Requirements for the construction of multimedia knowledge graph database structure based on artificial intelligence" (New) [[SG16-TD280/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0280)]
* ITU-T F.748.35 (ex F.FML-TS-FR) "Requirement and framework of trustworthy federated machine learning based service" (New) [[SG16-TD264/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0264)]
* ITU-T F.748.36 (ex F.MAS) "Requirements and framework of multi-algorithm scheduling systems" (New) [[SG16-TD261/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0261)]
* ITU-T F.748.37 (ex F.JSQSUDAC) "Requirements and functional architecture of joint semantic query system of unstructured data across clusters" (New) [[SG16-TD281/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0281)]
* ITU-T F.748.38 (ex F.AICP-GA) "Technical specification for artificial intelligence cloud platform: General architecture" (New) [[SG16-TD277/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0277)]
* ITU-T F.748.39 (ex F.AICP-FRRC) "Functional requirements and reference architecture of artificial intelligence cloud platform for smart grid operation and maintenance" (New)\* [[SG16-TD262/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0262)]
* **DLT:** In addition to [six new work items](https://www.itu.int/ITU-T/workprog/wp_search.aspx?q=22/16) created, work progressed on various other drafts and work completed on nine new AAP Recommendations and one Technical Paper:
* ITU-T F.751.14 (ex H.DLT-RECT) "Reference architecture for information tracing of renewable energy consumption based on distributed ledger technology" (New) [[SG16-TD267/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0267)]
* ITU-T F.751.15 (ex H.DLT-AMMSP) "Assessment methods for DLT management service platforms" (New) [[SG16-TD268/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0268)]
* ITU-T F.751.16 (ex H.DLT-RFMSP) "Reference framework for DLT management service platforms" (New) [[SG16-TD269/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0269)]
* ITU-T F.751.17 (ex H.DLT-SCLMR) "Smart contract lifecycle management requirements for distributed ledger technology systems" (New) [[SG16-TD270/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0270)]
* ITU-T F.751.18 (ex H.DLT-EMDGP) "Framework for DLT-based energy metering data sharing" (New) [[SG16-TD271/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0271)]
* ITU-T F.751.19 (ex H.DLT-DST) "Framework and requirements for distributed ledger technology based on sharding technique" (New) [[SG16-TD272/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0272)]
* ITU-T F.751.20 (ex H.MDDMD-Arch) "Reference architecture for DLT-based multimedia data delivery management systems" (New) [[SG16-TD273/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0273)]
* ITU-T F.751.21 (ex F.DLT-TRICI) "Technical Requirements on inter-chain interoperability for permissioned distributed ledger technologies" (New) [[SG16-TD274/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0274)]
* ITU-T F.751.22 (ex F.DLT-FIN) "Financial distributed ledger technology application guideline" (New) [[SG16-TD275/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0275)]
* ITU-T HSTP.DLT-CG "Technical Paper on construction guidelines for city-level distributed ledger technology infrastructure" (New) [[SG16-TD284/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0284)]
* **Immersive live experience:** In addition to progressing the various existing ILE work items, work on completed for ITU-T H.430.8 (ex H.IIS-FA) "Functional architecture of interactive immersive services (IIS) systems" [[SG16-TD225/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0225)]. Four new work items were created: ITU-T H.ILE-FT "An architectural framework for first-person transfer immersive live experience" [[SG16-TD248-R1/WP3](https://www.itu.int/md/T22-SG16-240415-TD-WP3-0248/en)], H.ILE-3DIT "Functional requirements and frameworks of 3D model-based immersive telepresence services" [[SG16-TD249/WP3](https://www.itu.int/md/T22-SG16-240415-TD-WP3-0249/en)], H.ILE-AR "Requirements and framework of augmented reality for Immersive Live Experience (ILE) services" [[SG16-TD251/WP3](https://www.itu.int/md/T22-SG16-240415-TD-WP3-0251/en)] and H.ILE-3DINR "Framework and requirements of 3D reconstruction system based on implicit neural representation for ILE services" [[SG16-TD240/WP3](https://www.itu.int/md/T22-SG16-240415-TD-WP3-0240/en)].
* **Accessibility:** Work progressed with the approval of new Technical Paper ITU-T FSTP.ACC-MV-SUST "Technical Paper on accessibility in a sustainable metaverse" [[SG16-TD282/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0282)], which was the first deliverable of the ITU-T Focus Group on metaverse (FG-MV) to be approved as a Study Group product. Another FG-MV deliverable was adopted to further developed as ITU-T Technical Paper HSTP-ACC-MV-INTERPR on guidelines and requirements on interpreting in the metaverse [[SG16-TD184/WP2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-WP2-0184)]. New work item F.ACC-AMCS was created concerning ICT accessibility considerations during disaster situations in rural areas using moveable local clouds, as well as metadata profile for PwD for disaster resiliency.

Collaborative work continued within the IRG-AVA on [J.acc-us-prof](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17754) on "Common user profile format for audiovisual content distribution" and with JTC1/SC35 "*User interfaces*" for two joint texts:

* Draft [H.ACC-GVP](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14439) Guidance on the Visual presentation of audio information, including captions and subtitles (twin text of ISO/IEC 20071-23).
* Draft [F.ACC-AVSL](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16371) Visual presentation of audio information in sign languages (twin text of ISO/IEC 20071-24).
* **Human factors:** Approved under TAP new ITU-T F.760.2 (ex F.FR-ERSS) "Guidelines for user interface of first responders in emergency response support systems" after discussion of concerns raised by Member States [[SG16-TD258/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0258)]. Work was completed for:
* ITU-T F.748.30 (ex F.CSDH) "Requirements of communication services for digital humans" (New) [[SG16-TD254/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0254)]

# Recent collocated activities

Several activities were collocated with the Study Group 16 meeting:

* [ITU-T Study Group 16](https://www.itu.int/go/tsg16) (Rennes, 15-26 April 2024)
* ITU-T [JCA-AHF](https://www.itu.int/en/ITU-T/jca/ahf) on 24 April 2024
* [JVET](https://www.itu.int/en/ITU-T/studygroups/2022-2024/16/video/Pages/jvet.aspx) (Geneva, 17-24 April 2024)
* NOTE – JPEG of ISO/IEC JTC1/SC 29 [WG 1] did not meet in Rennes, but met in online, 8-12 April 2024
* MPEG of ISO/IEC JTC1/SC 29 [AGs 2, 3, 5 and WGs 2 to 8] (Rennes, 22-26 April 2024)
* Joint ITU /WHO Workshop on [Safe Listening in Video Gaming and Esports: Updates](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2024/0416/Pages/default.aspx) *(16 April 2024)*

# Future meetings

One joint meeting of WPs 1, 2, 3/16 is planned in Geneva, 30 August 2024, to start the approval process for texts that become mature, as well as to assess the status of the metaverse work, in particular for the deliverables from the FG-MV expected to be received from TSAG.

The next meeting of the study group, likely as the combined SG9 and SG16 (SGC), is planned in Geneva, 13-24 January 2025, in view of the advance planning needed for the collocated meetings with ISO/IEC JTC1/SC29 (MPEG & JPEG) for video compression (JVET). The 2nd meeting is also already planned in Geneva, 6-17 October 2025, for the same reasons.

Rapporteur meeting activities for the interregnum period are listed at <https://itu.int/go/rgm/tsg16>.

# New participation in the work of Study Group 16

The following organizations have joined the SG16 activities:

* Sector Members: Meta (United States), Changan Auto (China, upgraded from Associate), LPTIC-Libya Postal Telecommunication and Technology Holding Company
* Associates: Guodian (China), AI Speech (China), Somtel (Somalia), Hangzhou Harmony Cloud Technology (China), Hangzhou Sichuan Newstrong UHD Video Technology Co., Ltd. (China)

# Feedback and status reports on interim activities and collaboration

The status report in this clause was reviewed at the SG16 meeting in April 2024.

## TSAG meeting

The following documents from SG16 are available at this TSAG meeting:

| TD | Source | Subject |
| --- | --- | --- |
| [TSAG-TD540](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240729-TD-GEN-0540) | Chair, ITU-T SG16 | ITU-T SG16 Lead Study Group Report |
| [TSAG-TD570](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240729-TD-GEN-0570) | ITU-T SG16 | LS/r on the allocation of deliverables from FG-MV and on metaverse-related issues (TSAG-LS35) [from ITU-T SG16] |
| [TSAG-TD573](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240729-TD-GEN-0573) | ITU-T SG16 | LS/r on utilisation of tools to produce Recommendations (SG17-LS108) [from ITU-T SG16] |
| [TSAG-TDxxx](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240729-TD-GEN-0xxx) | Chair, ITU-T SG16 | ITU-T SG16 report to WTSA-24: Questions and Res.2 updates - Final version |

## Multimedia technologies, applications, systems and services

### JCA-MMeS

No meetings of the ITU-T JCA on multimedia aspects of e-services (JCA‑MMeS) were held after its 4th meeting in Geneva, 14 October 2019 [[Announcement](https://www.itu.int/ml/lists/arc/jca-mmes/2019-10/msg00000.html) | [Documents](https://www.itu.int/en/ITU-T/jca/mmes/Pages/docs.aspx) | [Report](https://www.itu.int/en/ITU-T/jca/mmes/JCAMMeS%20Docs/JCA-MMeS-Doc032.docx) | [LS-In](https://www.itu.int/net/itu-t/ls/ols.aspx?from=-1&to=6667&after=2019-03-30&before=2019-10-14)| [LS-Out](https://www.itu.int/net/itu-t/ls/ols.aspx?from=6667&after=2019-10-15&before=2020-06-30)] (the report was reviewed by SG16 at its closing plenary, 17 October 2019).

In reference to ITU-T A.1 clause 5 provisions, this SG16 meeting **did not consider** the continuation of the JCA-MMeS, which has been inactive for several meetings. As per A.1 clause 5.10, TSAG is expected to review all JCAs at its first meeting following the WTSA.

The list of nominated representatives is found in [JCA-MMES-DOC13-R1](https://www.itu.int/en/ITU-T/jca/mmes/JCAMMeS%20Docs/JCA-MMeS-Doc013-R1.docx).

The website for the JCA-MMES is found at <http://itu.int/en/ITU-T/jca/mmes>.

### Activities on metaverse

The metaverse discussions were initially addressed in the 1st session of SG16 ad hoc group on WTSA-24 preparations (AHG-WTSA24), the main outcomes were documented in [SG16-TD214/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0214):

– The **square brackets** concerning the studies on metaverse were **removed** from the texts of the existing Questions

– Text of the **SG16 mandate, lead roles and additional guidance** were updated to include metaverse aspects

– A draft text for a new Question on metaverse was presented and initially included in the set.

In AHG-WTSA24 sessions 2 and 3, there were additional **discussions on the text of the new Question**, however concerns were expressed on the broad scope of the proposed new Question, as well as possible overlap with other Questions that also already work on metaverse related topics. After the 3rd session, interested experts were invited to hold informal consultation on trying to improve the text. The outcome of the discussions is found in [SG16-TD248/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0248). As there was no consensus on the establishment of a new Q.MV/16, it was decided to discuss the issue at the closing SG16 Plenary. At the closing SG16 plenary, **it was agreed to consult TSAG for advice on the best way to handle a new Question on metaverse** in SG16 for the next study period (see reference at the end of this section). In the LS ([TSAG-TD570](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240729-TD-GEN-0570)), TSAG was kindly invited to provide advice to SG16 (and possibly other SGs), from an ITU-T wide coordination perspective, on considerations about adopting this Question for the next period, including the appropriateness of having a TSAG proposal to WTSA-24 on this matter (possibly including metaverse-related Questions proposed by other ITU-T study groups).

In AHG-WTSA24 session 2, there was an idea to create a **SG16 ad hoc group on metaverse** (AHG-MV) to help progress the metaverse standardization work in the interregnum period, the ToRs was found in [SG16-TD216/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0216). After several consultations and discussion at the SG16 closing plenary, revision 2 of the TD was reviewed and it was agreed to create the AHG-MV (ToR at [https://itu.int/en/ITU-T/studygroups/2022-2024/16/Documents/docs/MV-AHG-ToR-20240426.‌pdf](https://itu.int/en/ITU-T/studygroups/2022-2024/16/Documents/docs/MV-AHG-ToR-20240426.pdf)) with Mr Shin Gak Kang (Rep. of Korea) as chair. Interested experts were invited to join the dedicated mailing list [t22sg16ahgmv@lists.itu.int](mailto:t22sg16ahgmv@lists.itu.int), which will provide meeting announcements and other relevant information and discussions. The AHG-MV will be active until the first SG16 meeting in 2025.

In addition to the above, Q26/16 assessed the provided FG-MV deliverables and:

* Agreed one deliverable as a new Technical paper ITU-T FSTP.ACC-MV-SUST "*Technical Paper on accessibility in a sustainable metaverse*" [[SG16-TD282/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0282)] based on Deliverable FGMV-16 (same title).
* Started new work item FSTP-ACC-MV-INTERPR "*Technical paper on Guidelines and requirements on interpreting in the metaverse*" [[SG16-TD184/WP2](http://www.itu.int/md/T22-SG16-240415-TD-WP2-0184)], which is based on Deliverable FGMV-17 "*Technical Report on Guidelines and requirements on interpreting in the metaverse*"
* Decided it would **not** work on deliverable **FGMV-03** "*Technical Report on Guidelines to assess inclusion and accessibility in metaverse standards development*" assigned to SG16 due to lack of interest from Q26/16. This deliverable could be **reassigned to other SGs** if they are interested.

SG16 also created an [ad hoc group of the plenary on metaverse](https://itu.int/en/ITU-T/studygroups/2022-2024/16/Documents/docs/MV-AHG-ToR-20240426.pdf) (AHG-MV) to help progress the metaverse standardization work in the study group between this and the next meeting [[SG16-TD216-R2/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0216)] (mailing list [message](mailto:t22sg16ahgmv@lists.itu.int) / [subscription](https://itu.int/go/tsg16/services) / [archive](https://www.itu.int/ml/lists/arc/t22sg16ahgmv); [IFA](https://www.itu.int/ifa/t/2022/sg16/exchange/plen/ahgmv/)).

### Ubiquitous multimedia applications

Work started on seven new work items, including H.MMAuth on a framework for verification of multimedia content authenticity [[SG16-TD215-R1/WP1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-WP1-0215)], which can be instrumental in combating fake news and media. Work was completed on six new Recommendations that extend the toolset of SG16 Recommendations for support of multimedia applications and services:

* ITU-T F.743.25 (ex F.MDAM-PR) "Procedures and requirements for multimedia data asset management" (New) [[SG16-TD223-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0223)]
* ITU-T F.747.15 (ex F.EVSreqs) "Requirements of event-based vision systems" (New) [[SG16-TD253/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0253)]
* ITU-T F.748.28 (ex F.DTP-Reqts) "Requirements and functional architecture of digital twin platform for supporting multimedia services" (New) [[SG16-TD226-R2/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0226)]
* ITU-T F.748.29 (ex F.MFDreqs) "Framework and requirements of computer audition based machinery fault diagnosis systems" (New) [[SG16-TD251/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0251)]
* ITU-T H.626.7 (ex H.MVSarch) "Functional architecture for machine vision systems in smart manufacturing" (New) [[SG16-TD224-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0224)]
* ITU-T H.644.8 (ex H.MPSTech) "Requirements and architecture on audio and video processing of media processing services" (New) [[SG16-TD252-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0252)]

## IP-based television services and digital signage

Question 13/16 on IPTV, Digital Signage and CDN had two online meeting:

* Virtual, 7-9 November 2023, [Q13/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14131&Group=16), [SG16-TD177/WP1 (2023-11)](https://www.itu.int/md/T22-SG16-231116-TD-WP1-0177)
* Xi'an, China, 29-31 January 2024, [Q13/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14366&Group=16), [SG16-TD197/WP1 (2024-04)](https://www.itu.int/md/T22-SG16-240415-TD-WP1-0197)

SG16 maintains standardization roadmaps for IPTV, digital signage and multimedia content delivery networks (MCDN), see online at:

* <https://itu.int/en/ITU-T/studygroups/2022-2024/16/Pages/rm/iptv.aspx>
* <https://itu.int/en/ITU-T/studygroups/2022-2024/16/Pages/rm/ds.aspx>
* <https://www.itu.int/en/ITU-T/studygroups/2022-2024/16/Pages/rm/mcdn.aspx>

Q13/16 received 14 LSs.

## Human factors and ICT accessibility for digital inclusion

**Question 26/16** is the key Question in ITU-T for accessibility and it held no interim meetings.

**Question 24/16** is the key Question in ITU-T for human factors. The Question held two interim meetings:

* Virtual, 7 November 2023, [Q24/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14127&Group=16), [SG16-TD122/WP2 (2023-11)](https://www.itu.int/md/T22-SG16-231122-TD-WP2-0122)
* Virtual, 5 March 2024, [Q24/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14127&Group=16), [SG16-TD136/WP2 (2024-04)](https://www.itu.int/md/T22-SG16-240415-TD-WP2-0136)

Currently, Masahito Kawamori (Keio University, Japan) is the SG16 Liaison Officer for accessibility and human factor matters in **ITU-T** [**JCA-AHF**](http://www.itu.int/en/ITU-T/jca/ahf/Pages/default.aspx). The JCA-AHF coordinates activities related to accessibility and human factors, and it held a meeting in Geneva, 19 July 2024,. The meeting report is found on the JCA-AHF webpage. The group will meet next (online) on 24 April 2024.

Collaboration between SG16 and ISO/IEC **JTC1 SC35** "User interfaces" continues. Work completed on:

* ITU-T [T.701.11](https://www.itu.int/rec/T-REC-T/recommendation.asp?lang=en&parent=T-REC-T.701.11) (2020) "Guidance on text alternatives for images" (twin text of ISO/IEC 20071-11:2019)
* ITU-T [T.701.21](https://www.itu.int/rec/T-REC-T/recommendation.asp?lang=en&parent=T-REC-T.701.21) (ex H.ACC-GAD, 2022) "Guidance on audio description" (twin text of ISO/IEC TS 20071-21:2015)
* ITU-T [T.701.25](https://www.itu.int/rec/T-REC-T/recommendation.asp?lang=en&parent=T-REC-T.701.25) (ex H.ACC-GAP, 2022) "Guidance on the audio presentation of text in videos, including captions, subtitles and other on-screen text" (twin text of ISO/IEC 20071-25:2017)

The following texts are being progressed:

|  |  |
| --- | --- |
| [F.ACC-AVSL](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16371) ISO/IEC 20071-24 | Visual presentation of audio information in sign languages |
| [H.ACC-GVP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14439) ISO/IEC 20071-23:2018 | Guidance on the visual presentation of audio information, including captions and subtitles |

NOTE – See §‎6.9.1 concerning **IRG-AVA** updates.

Together, the Questions received ten LSs.

## Multimedia aspects of automotive-related intelligent services

The following are the key activities guiding the ITS work.

ITU-T Q27/16 is the key Question in ITU for vehicular gateway matters, Rapporteur Mr Hideki Yamamoto (OKI, Japan). The Question held three interim meetings since the last SG16 meeting:

* Virtual, 5-6 September 2023, [Q27/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14099&Group=16), [SG16-TD180-R1/WP1 (2023-11)](https://www.itu.int/md/T22-SG16-231116-TD-WP1-0180)
* Virtual, 16-24 October 2023, [Q27/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14143&Group=16), [SG16-TD181-R1/WP1 (2023-11)](https://www.itu.int/md/T22-SG16-231116-TD-WP1-0181)
* Virtual, 19-23 February 2024, [Q27/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14490&Group=16), [SG16-TD199/WP1 (2024-04)](https://www.itu.int/md/T22-SG16-240415-TD-WP1-0199)

Further details on other related activity:

* The CITS (see §‎6.5.1)

The two ITS-related focus groups in SG16, FG-AI4AD and FG-VM, concluded their operations in September 2022, and some of the transferred work items continue to be developed in Q27/16.

Ten LSs were received concerning ITS.

### Collaboration on ITS Communication Standards (CITS)

The Collaboration on ITS Communication Standards ([CITS](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx)) has become the globally recognized forum for the coordination of Intelligent Transportation Systems (ITS) communication standards. CITS supports the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

A CITS meeting has been on 22 September 2023. The meetings of the Collaboration on ITS Communication Standards discuss the various ITS-related standardization activities in the different SDOs, through progress and status reports submitted. The documents of the meeting in September 2023 are available [here](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/meeting-documents.aspx?RootFolder=/en/ITU-T/extcoop/cits/Documents/Meeting-20230922-e-meeting&FolderCTID=0x0120008D91490DA7927C4D8A0BB5A73929B07D&View=%7b73BE16B3-22C9-43D5-A9FD-D8BC067A87FF%7d).

Following the discussions during the previous CITS meeting, several SDOs have provided information on their relevant standards for inclusion in the [online ITS Communication Standards database](https://www.itu.int/itu-t/landscape/?topic=tx21&group=g&search_text=). The CITS meeting in September 2023 was attended by 47 participants representing SDOs and other organizations including 3GPP, IEEE, 5GAA, ISO, ETSI, Car2Car Communication Consortium, CCSA, CATARC, CSAE, ARIB, TSDSI, SAE International, WWRF, UNECE, among others. These entities and their related groups provided progress reports to CITS. The relevant inputs from the progress reports were included in the ITS communication database in due time.

Furthermore, during the CITS meeting, the [Expert Group on Communications Technology for Automated Driving](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/egcomad.aspx) was established. This new group will explore the communications technologies for automated driven vehicles, aiming at enabling the equipment of all new vehicles (from about 2030) with the necessary communications technology, so that all vehicles with automated driving systems are able to drive as safely as practical, including doing reliable automated merging, among other applications (see [paragraph 2](#_2_CITS_Expert) below for more details).

The e-meeting of CITS in September 2023 was followed by a spin-off edition of the Symposium on the Future Networked Car ([FNC spin-off in Qatar](https://fnc.itu.int/fnc-regional-spin-off-in-qatar/)), co-organized by ITU and UNECE on 6 October 2023. The Symposium, which was sponsored (platinum level) by the Communication Regulatory Authority of Qatar (CRC), was organized as a physical event (first time since Covid) and was collocated with the spin-off of the Geneva Motor Show in Doha, Qatar and the F1 race.

CITS continues to provide the link between ITU and the [UNECE World Forum for Harmonization of Vehicle Regulations (WP.29)](http://www.unece.org/trans/main/welcwp29.html) for topics including ITS and automated driving, for which various ITU-T study groups have ongoing studies.

Collaboration among the UNECE Task Force on cybersecurity and OTA issues and ITU-T SG17 is useful to discuss related topics in both organizations with the participation of delegates of both UNECE WP29 and Q13/17, as well as CITS in general.

Additionally, the informal group "UN Task Force on Vehicular Communication" continue to operate under the UNECE WP29 informal group on ITS: <https://wiki.unece.org/display/trans/ITS+Task+Force+on+Vehicular+Communications>

ITU delegates interested in participating in UNECE WP.29 activities are invited to consult the meeting schedule at <http://www.unece.org/trans/main/wp29/meetings_events.html> and to contact Mr Russ Shields (CITS Chair) and Mr Stefano Polidori (ITU/TSB) at [tsbcits@itu.int](mailto:tsbcits@itu.int) for additional information and coordination. CITS will continue reviewing and discussing the progress in WP.29 and coordinate ITS communications related input.

A complete report of the latest CITS activities until January 2024 is found in [TSAG-TD431](https://www.itu.int/md/T22-TSAG-240122-TD-GEN-0431/en) (January 2024). The report of the CITS meeting on 15 March 2024 was not yet available as of the publication of this TD.

The next CITS meeting is planned 13 September 2024 - 0900-1700 CEST.

One LSs was received from the CITS.

The CITS home page is <https://itu.int/en/ITU-T/extcoop/cits>.

## Multimedia aspects of digital health

The reference Question on digital health is Q28/16.

The Question received three LSs.

### Personal connected health – H.810-H.850 series

No proposal for maintenance of one Recommendation in the conformance testing block was received at this meeting.

The Technical Paper for trial implementation in HSTP-H810-FHIR remains in force, as the status in HL7 and PCHA is still the same.

### Collaboration with WHO

* Safe listening: revised H.870 (V2) was approved in March 2022.
* Technical Paper [HSTP-CONF-H870](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14906) is being reviewed to align the guidelines for testing of personal audio systems for compliance with the 2nd edition of H.870. It is proposed for agreement at this meeting.
* A technical paper on safe listening in venues is currently being developed, [HSTP-SLD-Venue](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18938), *Guideline on safe listening at venues and events*.
* The new work item on safe listening for video gaming and esports [H.SL-ES](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19011) progressed in the interim period and three workshops were organized. See the complete list here: <https://www.itu.int/en/ITU-T/Workshops-and-Seminars/dh>. Consent is expected in January 2025.
* An ITU/WHO video promoting the safe listening standard is found here: <https://youtu.be/Nm6T0f8SeHs>.

### JCA-DCC

The Liaison Officer is Ms Shan Shu (CAICT, MIIT, China; [xushan@caict.ac.cn](mailto:xushan@caict.ac.cn)).

The fifth meeting of the Joint Coordination Activity on Digital COVID-19 Certificates (JCA-DCC) took place in Seoul, 11 September 2023 and JCA-DCC has progressed work on a DCC standardization roadmap. The meeting reviewed the outcomes from the [joint ITU/WHO Workshop on "Future of Verifiable Health Credentials Beyond COVID-19"](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2023/0911/Pages/default.aspx), in particular the [key takeaways/‌suggestions](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2023/0911/Documents/Outcomes%20Document.pdf) from the workshop. The ToR for a Joint Coordination Activity on Verifiable Health Credentials (JCA-VHC) are also developed.

The Joint Coordination Activity on Digital COVID-19 Certificates (JCA-DCC) held its sixth meeting on 23 February 2024. The group continued work on a standardization roadmap for Digital COVID-19 Certificates and is seeking feedback on the draft roadmap. The report of the meeting is attached to the LS. The date for the final meeting will be announced later, and further collaboration is encouraged. In the next study period, the JCA-DCC will be morphed into a Joint Coordination Activity on Verifiable Health Credentials (JCA-VHC), with updated ToR as found in [SG16-TD387/Gen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-GEN-0387) Annex B. The JCA-VHC will be a platform for relevant stakeholders – such as public health authorities, telecom regulators, healthcare delivery organizations, services providers, platform providers, network operators, travellers' organizations, healthcare users' organizations, international organizations, and industry forums and consortia

Two LSs were received.

### Artificial Intelligence for health

The Focus Group on Artificial Intelligence for Health (FG-AI4H) was established under ITU-T SG16 and operated as a partnership of the International Telecommunication Union (ITU) and the World Health Organization (WHO) to develop a standardized assessment framework for the evaluation of AI-based methods for health, diagnosis, triage or treatment decisions. Participation in the FG-AI4H was free and open to all.

The FG-AI4H operated for five years, from September 2018 until September 2023, and organized 18 meetings. Its last meeting was Meeting S in Geneva (Switzerland), 3-4 July 2023, and the final activities were the approval by correspondence of a final set of deliverables.

After five years in operation, the FG-AI4H reaches its sunset with the following results:

* A dynamic, inclusive, interdisciplinary/cross-sector community of international experts
* A set of 36 completed deliverables including three TG output documents as of end of Sep. 2023 ([SG16-TD203/Plen](https://www.itu.int/md/T22-SG16-240415-TD-PLEN-0203)). The final list of approved deliverables is found here: [https://itu.int/‌en/ITU-T/focusgroups/ai4h/Pages/deliverables.aspx](https://itu.int/en/ITU-T/focusgroups/ai4h/Pages/deliverables.aspx).
* Uniquely valued guidance focused on the use of AI in health, including aspects such as ethics, regulatory guidance, data quality and clinical evaluation (DEL1 to DEL7 series).
* A deliverable from an ad hoc group on guidance on the use of AI and other digital technologies within the context of the COVID-19 pandemic, which may be useful when facing future health emergencies.
* Exploration of a wide range of health use cases with application of the guidance developed by the FG-AI4H (DEL10 series).
* The Open Code Initiative (OCI), a cloud software platform hosted on GitHub (<https://github.com/fg-ai4h>) that provides a proof-of-concept of the application of the various FG-AI4H horizontal deliverables for specific health use cases studies under the 24 Topic Groups of the FG-AI4H.

It took a good time to build this community of experts and to properly scope the issues to be tackled. There is value in continuing the current momentum to further the conditions for safe and ethical adoption of AI for health worldwide, also considering the fast evolution of AI technologies and the increasing interest of governments, industry and academia in applying AI to health.

As a consequence, [ITU, WHO and WIPO agreed to launch a successor collaboration platform](https://www.itu.int/hub/2023/07/new-un-initiative-aims-to-step-up-ais-contribution-to-health) in the form of a global initiative that would enable, facilitate use and promote implementation of AI for health, expected to start operations in 2nd quarter of 2024. The Global Initiative on AI for Health (GI-AI4H) is expected to grandfather the work developed by the FG-AI4H and further leverage and expand the community it developed.

Vice-chairs representing different key stakeholders working on AI for health have been nominated:

* Stephen Ibaraki (ACM and REDDS Capital, USA)
* Ramesh Krishnamurthy (WHO/Health Metrics and Measurement Cluster)
* Naomi Lee (The Lancet, UK)
* Sameer Pujari (Be Healthy Be Mobile Initiative and WHO/Non-communicable Diseases Cluster)
* Manjula Singh (ICMR, India)
* Shan Xu (CAICT, China)

The FG has seven established working groups and one in preparation ([ToRs](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/wg.aspx)):

* Data and AI solution assessment methods (WG-DAISAM)  
  Chair: Pat Baird (Philips)  
  Vice-chair: Luis Oala (Fraunhofer HHI, DE)
* Data and AI solution handling (WG-DASH)  
  Chair: Marc Lecoultre (MLlab.AI, CH)  
  Vice chair: Ferhat Kerif (CHUV, CH)
* Operations (WG-O)  
  Co-chairs: Markus Wenzel and Monique (Fraunhofer HHI, Germany)
* Regulatory considerations on AI for health (WG-RC)  
  Chair: Naomi Lee (The Lancet, UK)  
  Vice-chairs:
* Paolo Alcini (European Medicines Agency, EU)
* Chandrashekar Ranga   
  (CDSCO, India)
* Khair ElZarrad (FDA, USA)
* Wolfgang Lauer (Federal Institute for Drugs and Medical Devices, Germany)
* Peng Liang (National Medical Products Administration, China)
* Ethical considerations on AI for health (WG-Ethics)  
  Chair: Andreas Reis (WHO)
* Clinical Evaluation (WG-CE)  
  Chair: Naomi Lee (The Lancet, UK)

The group worked in partnership with the WHO and is a collaborative platform to establish a standardized (ICT) assessment framework for the evaluation of AI-based methods for health, diagnosis, triage or treatment decisions. It held one meeting since last TSAG meeting (online, 7-8 May 2020) and expanded the number of identified several use cases:

* Cardiovascular disease risk prediction (TG-Cardio)
* Dermatology (TG-Derma)
* Falls among the elderly (TG-Falls)
* Histopathology (TG-Histo)
* Malaria detection (TG-Malaria)
* Neurological disorders (TG-Neuro)
* Ophthalmology (TG-Ophthalmo)
* Outbreak detection (TG-Outbreaks)
* Psychiatry (TG-Psy)
* Snakebite and snake identification (TG-Snake)
* Symptom assessment (TG-Symptom)
* Tuberculosis (TG-TB)
* Volumetric chest computed tomography (TG-DiagnosticCT)
* Primary and secondary diabetes prediction (TG-Diabetes)
* Diagnoses of bacterial infection and anti-microbial resistance (AMR) (TG-Bacteria)
* Dental diagnostics and digital dentistry (TG-Dental)
* AI-based detection of falsified medicine (TG-FakeMed)
* Maternal and child health (TG-MCH)
* Radiotherapy (TG-Radiotherapy)
* Endoscopy (TG-Endoscopy)
* Musculoskeletal medicine (TG-MSK)
* Human reproduction and fertility (TG-Fertility)
* Point-of care diagnostics (TG-POC)

A final progress report for the July to September 2023 period is found in [SG16-TD202/Plen](http://www.itu.int/md/T22-SG16-240415-TD-PLEN-0202).

As a final note, the FG-AI4H results would not have been possible without the countless hours of volunteered by the experts in the meetings, working groups, topic groups and ad hoc group, as well as the two grants provided by Fondation Botnar that allowed in particular the organization of meetings with participation from low- and middle-income countries and the development of the Open Code Initiative platform.

For more details, see <https://itu.int/go/fgai4h>.

## Digital culture

The reference Question on digital culture is Q23/16. The Question held two interim meetings:

* Virtual, 20-21 November 2023, [Q23/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14206&Group=16), [SG16-TD121-R1/WP2 (2023-11)](https://www.itu.int/md/T22-SG16-231122-TD-WP2-0121)
* Virtual, 28-29 February 2024 , [Q23/16](https://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=14538&Group=16), [SG16-TD135/WP2 (2024-04)](https://www.itu.int/md/T22-SG16-240415-TD-WP1-0135)

The Question received one LS.

## Multimedia aspects of distributed ledger technology (DLT) and its applications

The reference Question on DLT is Q22/16. The Question held no interim meetings.

The Question received eight LSs.

## Intersector Rapporteur Groups

### IRG-AVA

Q26/16 is part of the [IRG-AVA](https://www.itu.int/en/irg/ava/Pages/default.aspx), the *Intersector Rapporteur Group on Audiovisual Media Accessibility*. The SG16 co-chair in the group is Mr Masahito Kawamori (Keio University, Japan). The two recent meetings of the group were:

* 29th meeting: Geneva, 12 March 2024 (1545-1730 hours CET)  
  [Announcement](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2403-000-Notification-v1.pdf) - [Agenda](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2403-001.docx) - [Report](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2403-002.docx) - [Transcript](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2403-000-captioning.docx) - [LS in](https://www.itu.int/net/itu-t/ls/ols.aspx?from=-1&to=2531&after=2024-01-17&before=2024-03-12) - [LS Out](https://www.itu.int/net/itu-t/ls/ols.aspx?from=2531&after=2024-03-12) - [Documentation](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/Forms/2403GVA.aspx)\*
* 28th meeting: Virtual, 17 January 2024 (1500-1800 hours CET)  
  [Announcement](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2401-000-Notification-v1.pdf) - [Agenda](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2401-001.docx) - [Report](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2401-002.docx) - [Transcript](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2401-000-captioning.docx) - [LS in](https://www.itu.int/net/itu-t/ls/ols.aspx?from=-1&to=2531&after=2023-11-10&before=2024-01-17) - [LS Out](https://www.itu.int/net/itu-t/ls/ols.aspx?from=2531&after=2024-01-17) - [Documentation](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/Forms/2401VIR.aspx)\*
* 27th meeting: Virtual, 10 November 2023 (1330-1630 hours CET)  
  [Announcement](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2311-000-Notification-v1.pdf) - [Agenda](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2311-001.docx) - [Report](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2311-002.docx) - [Transcript](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2311-000-Captioning.docx) - [LS in](https://www.itu.int/net/itu-t/ls/ols.aspx?from=-1&to=2531&after=2023-07-18&before=2023-11-10) - [LS Out](https://www.itu.int/net/itu-t/ls/ols.aspx?from=2531&after=2023-11-09) - [Documentation](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/Forms/2311VIR.aspx)\*
* 26th meeting: Geneva, 18 July 2023 (1430-1730 hours CEST) + informal ad-hoc sessions, virtual, 10-11 August 2023  
  [Announcement](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2307-000-Notification-v1.pdf) - [Agenda](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2307-001.docx) - [Report](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2307-002.docx) - [Transcript](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/IRG-AVA-2307-000-Captioning.docx) - [LS in](https://www.itu.int/net/itu-t/ls/ols.aspx?from=-1&to=2531&after=2022-09-07&before=2023-05-10) - [LS Out](https://www.itu.int/net/itu-t/ls/ols.aspx?from=2531&after=2023-07-18&before=2023-11-09) - [Documentation](https://extranet.itu.int/sites/irg/ava/Shared%20Documents/Forms/2307GVA.aspx)\*

The next meeting is planned in June 2024, details TBC.

Five LSs were received from IRG-AVA.

## Various collaboration matters

Coordinated activity continued with inter alia MPEG and JPEG.

### ITU-T SG9

The Liaison Officer from SG9 into SG16 is Mr Satoshi Miyaji (KDDI, Japan).

Close coordination continues with SG9 on accessibility matters, as Question 11/9 on accessibility. ITU-T SGs 9 and 16 take both in IRG-AVA (§‎6.9.1).

Six LSs were received from ITU-T SG9.

### ITU-T SG12

The Liaison Officer position is vacant. Areas of common interest continue to include:

* AI in multimedia
* Quality assessment methods
* ITS and telepresence
* AR/VR/XR/Metaverse
* Safe listening (H.870)

Five LS from SG12 were addressed to SG16 at this meeting.

### ITU-R

In addition to joint studies under the IRG-AVA, SG16 received or was copied in five LSs or information documents from ITU-R.

### ITU-D

SG16 received the four LSs from ITU-D.

### ISO/IEC JTC1

None at this meeting.

### ISO/IEC JTC1 SC29

The Liaison Officer is Mr Gary Sullivan (Dolby Labs, USA), who is also chairs SC29.

Many of the JTC1/SC29 areas of work are closely related to those of SG16, and the two organizations also have joint work as further described below.

SC29 held two plenary meetings since the previous meeting of SG16. The 43rd and 44th SC29 plenary meetings were held on 23–24 July 2023 in Geneva, Switzerland and 6–8 February 2024 by teleconference, respectively. The next meeting of SC29 is scheduled on 20–21 July 2024 in Sapporo, Japan.

Meetings of most of the working groups and advisory groups of SC29 are being held in person with remote participation in Rennes, France, during the current meeting of SG16. For information regarding potential joint meeting sessions with SC29 groups during the current meeting, see the time plan in the latest revision of [SG16-TD194/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-PLEN-0194).

Ongoing collaborations with SC29 are conducted with SC29/WG1 (JPEG) and SC29/WG5 (as JVET), as further discussed in subsections of this section.

In this period, SG16 received 13 LS from SC29 (including its WGs).

### ISO/IEC JTC1 SC29/WG 1 (JPEG)

The Liaison Officer is Mr Gary Sullivan (Dolby Labs, USA).

Historically, the JPEG group is a joint collaborative team between ITU-T (now in SG16 Q6/16, historically previously in ITU-T SG8) and ISO/IEC JTC1 SC29/WG1. A number of texts in the area of image coding, including the T.8x (JPEG), T.80x (JPEG 2000) and T.83x (JPEG XR) series, are common or twin ISO/IEC and ITU-T texts.

A meeting of JPEG was held in person with remote participation in Covilha, Portugal during the last meeting of SG16, two further JPEG meetings have been held since then (during 30 October–3 November 2023 by teleconference, and during 21–26 January 2024 in San Francisco, United States of America), and another JPEG meeting was held during 8–12 April 2024 by teleconference just before the current meeting of SG16.

Revisions of several common and twin text Recommendations are under development in JPEG, and work on the new Recommendation T.JPEG-AI "JPEG AI learning-based image coding system" is progressing well. The ISO/IEC Committee Draft of the JPEG AI Core coding system (ISO/IEC 6048-1) was released in November 2023, and the ISO/IEC Draft International Standard of the JPEG AI Core coding system is expected to become available in April 2024 and the International Standard in October 2024. The JPEG AI verification model 5 demonstrates 12.5% to 27.9% coding efficiency gain in terms of objective quality over a VVC anchor using an average of several objective distortion measures. JPEG is also considering developing a version 2 to address requirements not yet fulfilled (e.g. machine consumption tasks) as well as to continue to improve compression efficiency. Work on JPEG AI version 2 is expected to start in 2025, but has not yet been officially launched as a project. Additional associated specifications are also planned, such that a suite of JPEG AI specifications is planned as follows:

* ISO/IEC 6048-1 Information technology - JPEG AI learning-based image coding system: Core coding system (previously planned, potential version 2 under consideration)
* ISO/IEC 6048-2 Information technology - JPEG AI learning-based image coding system: Profiling
* ISO/IEC 6048-3 Information technology - JPEG AI learning-based image coding system: Reference software
* ISO/IEC 6048-4 Information technology - JPEG AI learning-based image coding system: Conformance, and
* ISO/IEC 6048-5 Information technology - JPEG AI learning-based image coding system: File format.

The work programme of ITU-T SG16 should be updated to reflect the subdivision of JPEG AI into these five specifications.

A new (3rd) edition is planned for Rec. ITU-T T.815 v3 | ISO/IEC 15444-16 Ed.3 *Information technology - JPEG 2000 image coding system: Encapsulation of JPEG 2000 images into ISO/IEC 14496-12.* Please note that the planned title for the new edition ends with 14496-12 rather than 23008-12 as in the current edition.

At the current meeting, Consent is expected for the following collaboration work item with JPEG: Rec. ITU-T T.800 (V4) | ISO/IEC 15444-1 Ed.5 "Information technology - JPEG 2000 image coding system: Core coding system".

### ISO/IEC JTC1 SC29/WG 5 (JVET)

The Liaison Officer is Mr Gary Sullivan (Dolby Labs, USA).

The video coding work conducted collaboratively with SC29/WG5 (formerly SC29/WG11) as the Joint Video Experts Team (JVET) has been very active, attracting more than 400 participants (including more than 175 in-person attendees when the JVET meeting was held as an in-person meeting in October 2023) and approximately 180 technical contributions (not counting reports and crosschecks) for the recent and current meetings. A meeting of JVET is being held along with the current ITU-T SG16 meeting under the auspices of ITU-T SG16 in Rennes, France. The activities in JVET are managed on the ITU-T side by Q6/16. JVET is tasked with the development, maintenance and extension of the jointly developed video coding standards in the domain of SG16 and SC29, and with exploration work on potential additional such future standards development projects relating to video coding. It also maintains the specification of Versatile Supplemental Enhancement Information (VSEI, Rec. ITU-T H.274, twin text with ISO/IEC 23002-7) and Coding-Independent Code Points for Video Signal Type Identification (CICP, Rec. ITU-T H.273, twin text with ISO/IEC 23091-2) and develops reports on non-normative topics relating to video coding (including H.Sup15, H.Sup18, H.Sup19, HSTP-VID-WPOM, H.Sup-FGST, and H.Sup-MACVC, which are twin texts with ISO/IEC technical reports) and reference software and conformance testing specifications relating to the jointly developed video coding specifications.

A meeting of JVET was held in Geneva, Switzerland, during the previous meeting of SG16, under the auspices of SG16. Two additional meetings of JVET were held during 13–20 October 2023 (including weekend days) in Hannover, Germany, and during 17–26 January 2024 (excluding weekend days) by teleconference, since the previous meeting of SG16. The reports of the July and October JVET meetings were approved at the interim meeting of WP3/16 in December 2023.

Items for potential Consent at the current meeting of SG16 include:

* H.264 (V15) "Advanced video coding for generic audiovisual services"
* H.265 (V10) "High efficiency video coding"

The JVET is also exploring video coding technologies with compression capabilities beyond VVC based on machine learning as well as traditional signal processing methodologies. The exploration activities have drawn strong interest and participation. A software codebase was established in July 2022 for the neural network-based video coding (NNVC) exploration work. The most recent software NNVC-7.1 supports five tools: NN-based intra prediction, NN-based super-resolution, NN-based post-filter, low operation point NN-based in-loop filter (LOP NNLF), and high operation point NN-based in-loop filter (HOP NNLF). Compared to VVC, bit rate reductions from NN-based intra + LOP NNLF and NN-based intra + HOP NNLF in terms of luma PSNR are 6.9% and 13.6%, respectively, with LOP NNLF having a fraction of the model complexity of HOP NNLF.

The enhanced compression model (ECM) exploration using traditional signal processing methodologies continues to produce promising gains. The ECM has incorporated new coding tools and coding tool improvements in all functions of a traditional video codec, including intra prediction, inter prediction, loop filtering, transform and quantization, entropy coding, etc. Currently at version 12, the ECM achieves approximately 24% performance gain in terms of objective quality compared to VVC. Subjective tests are planned to be conducted during this current JVET meeting to assess ECM's subjective quality benefits compared to VVC.

In the area of "Video Coding for Machines" (VCM), which aims at achieving high compression efficiency for machine vision tasks such as object detection and object tracking, JVET continues to develop the H.Sup-MACVC technical report on non-normative VCM coding technologies. In parallel, SC29/WG4 has been developing a new VCM standard that specifies normative VCM coding technologies. In SC29, another VCM-related activity is the development of a new Feature Coding for Video Coding for Machines (FCVCM) standard, which aims at compressing intermediate features within neural networks for machine tasks. FCVCM is also being developed in SC29/WG4. JVET and SC29/AG5 have also been coordinating efforts for verification testing of VVC multi-layer coding and film grain synthesis.

### Other groups

A brief report was received for the following groups.

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| Group: | [CITS](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx) – Collaboration on ITS Communication Standards |
| Liaison officer(s): | Hideki Yamamoto (OKI) |
| Report: | Two CITS e-meetings (22 Sep. 2023 and 15 Mar. 2024) were held after 8th ITU-T SG16 meeting. The current status on ITS study in ITU-T SG16 were reported [1].  In CITS, a new Expert Group on Communications Technology for Automated Driving was established as announced in [[SG16-TD240/Gen](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-240415-TD-GEN-0240)]. We have already joined and will follow it ([https://itu.int/en/ITU-T/extcoop/‌cits/Pages/egcomad.aspx](https://itu.int/en/ITU-T/extcoop/cits/Pages/egcomad.aspx)).  **References**  [1] ITU-T SG16 progress report for two CITS e-meetings (22 September 2023 and 15 March 2024) [[SG16-TD200/WP1](http://www.itu.int/md/T22-SG16-240415-TD-WP1-0200)]. |

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| Group: | ASTAP / [APT](http://www.apt.int/) – Asia-Pacific Telecommunity |
| Liaison officer(s): | Hideki Yamamoto (OKI) |
| Report: | After SG16 (Geneva, 10-21 July 2023), no APT Standardization Program Forum (ASTAP) was held.  The next ASTAP, the 36th APT Standardization Program Forum ([ASTAP-36](https://www.apt.int/2024-ASTAP36)), will be held from 20 to 24 May 2024 in Bangkok, Thailand with physical attendance as well as virtual/online participation through Zoom meeting (i.e. hybrid meeting).  The deadline of online registration is 22 April 2024.  In ASTAP-36, SG16 activities will be introduced and the result of questionnaires about CDN and metaverse in Asia-Pacific region may be discussed. |

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| Group: | [ITU-T SCV & ITU-R CCV](https://www.itu.int/en/ITU-T/committees/scv) |
| Liaison officer(s): | Evgeny Tonkikh, Russian Federation ([et@niir.ru](mailto:et@niir.ru)) |
| Report: | The various LSs from SG16 were considered and feedback provided via LS addressed to the concerned Questions, for their follow up. |

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| Group: | [ITU-T SG17](http://www.itu.int/go/tsg17) Security (ITS security) |
| Liaison officer(s): | Hideki Yamamoto (OKI) |
| Report: | There is nothing to report after the previous SG16 meeting.  Q13/17 (ITS Security) will be held on 4 and 5 June 2024 and  SG17 will be held virtually 11-12 July 2024. |

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| Group: | CENELEC TC108X |
| Liaison officer(s): | Thomas Lund, GENELEC, Finland ([thomas@lund.one](mailto:thomas@lund.one)) |
| Report: | TC108X WG3 is currently developing an amendment to IEC 62368-1 "Audio/video, information and communication technology equipment – Part 1: Safety requirements", to synchronize it with an equivalent EN standard.  TC108X/WG3 has started study on a new work item, "sound exposure in wireless listening devices", which could also imply in updates to H.870. They are also considering safe listening in video gaming as future studies. |

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| Group: | JIC |
| Liaison officer(s): | Masahito Kawamori, Keio University, Japan ([kawamorim@gmail.com](mailto:kawamorim@gmail.com)) |
| Report: | JIC holds regular online meetings. Its current focus is on establishing a coordination mechanism for updates to the international patient record specifications that are spread in specifications from organizations, e.g. ISO TC215, HL7, etc. It is also working on a project to update its terminology database. |

No particular reports were provided for the following groups:

* ITU-T JCA-ML (Joint Coordination Activity on Machine Learning)
* IEC TC100
* CEN/TC434
* CEN/CENELEC JTC19
* ISO/IEC JTC 1/SC35 (User interfaces)
* ISO TC159/SC4
* ISO TC215
* INATBA (International Association for Trusted Blockchain Applications)
* DAISY
* W3C

## Bridging the standardization gap (BSG)

The mentor in ITU-T SG16 is Mr Hideki Yamamoto (OKI Electric, Japan).

No particular BSG-related activities were held under SG16 since the last TSAG meeting.

A leadership training session was not organized for this last SG16 meeting in the study period. Delegates were directed to the reference material is available as attachment 1 to [SG16-TD115-R1/Plen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-230710-TD-PLEN-0115) of the previous SG16 meeting (July 2023). A recording of the session is available.[[1]](#footnote-2), as well as in [YouTube](https://youtu.be/gDrDbs59kqk), video only

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1. <https://remote10.itu.int/playback/presentation/2.3/2713ff236d3ed41d08e5d4b493d3335e9ff555d2-1689158112460> [↑](#footnote-ref-2)