Joint Q4/1 and Q5/2 Workshop on role and economic impact of AI and metaverse in the digital transformation
(Geneva, 7 October 2026)



Metaverse standardization activities in ITU-T

7 October 2026

Shin-Gak KANG, ETRI (Republic of Korea)

Chair, ITU-T TSAG JCA-MV
Vice-Chair, ITU-T SG21 (Multimedia, content delivery and CATV)
Chair, ITU-T SG21 WP4 (Infra. for multimedia systems, including metaverse)
Vice-Chair, ITU-T FG-EAI (Embodied AI)

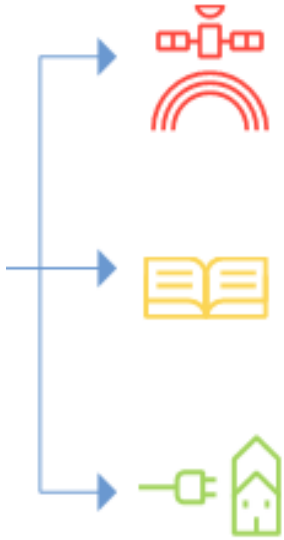
ITU – Who we are – Our Membership

UN agency for ICT
Information and communication technology

193
MEMBER STATES

900+
PRIVATE SECTOR

150+
ACADEMIA



ITU Radiocommunication **(ITU-R)**
Coordinating radio-frequency spectrum and **assigning** orbital slots for satellites

ITU Standardization **(ITU-T)**
Establishing global standards

ITU Development **(ITU-D)**
Bridging the digital divide

A unique platform for governments, private sector and academic institutions to build consensus on important and pressing ICT technical and regulatory issues facing our society today

Progress on metaverse standardization in ITU-T (1/2)

January 2022: ITU-T SG16 meeting

- The necessity of standardization work on multimedia related metaverse issues was first discussed. (Initiated by Chinese experts)
- **Correspondence Group on Metaverse (CG-Metaverse) was established** with ToR
  - Co-chairman : Shin-Gak KANG (ETRI/Korea), Kepeng LI (Tencent/China)

July-Sep. 2022: CG-Metaverse

- Discussed standardization issues and the need for FG establishment through 3 e-meetings
  - First (06 July 2022), Second (10 August 2022), Third (8 September 2022)
- **Decided to propose the establishment of a new Focus Group** for metaverse standardization issues and working methods to ITU-T SG 16 meeting in October 2022

October 2022: : ITU-T SG16 meeting

- **Decided to establish a new FG-MV** and **propose to ITU-T TSAG** for approval.
  (TSAG: Telecommunication Standardization Advisory Group)*
- Agreed to establish **AHG-MV** for coordination on metaverse issues within ITU-T SG16

Progress on metaverse standardization in ITU-T (2/2)

December 2022: ITU-T TSAG meeting

- **Decided to establish the Focus Group on metaverse (FG-MV) under TSAG**
- Appointed FG-MV chair: Shin-Gak KANG (ETRI, Korea)

January 2023 ~ June 2024: ITU FG-MV activities

- **7 times of FG-MV meetings** and **155 WGs/TGs (e)-meetings**
- **Developed total of 52 FG-MV deliverables** over 18 months life-time

October 2024: WTSA-24

- **Approved new WTSA Resolution 105** (Promoting & strengthening metaverse standardization)

January 2025: ITU-T SG20 and SG21 meeting

- The harmonized **ToR for JCA-MV** was submitted to TSAG
- **Established the SG21 AHG-MV** to discuss about the necessity of establishing new Question

May 2025: ITU-T TSAG meeting

- TSAG **established new JCA-MV under TSAG** with the **ToR** and appointed **Co-chairs**

ITU Focus Group on metaverse (FG-MV)

Unanimously established by TSAG in December 2022

- ***(ITU) 193 Member States as well as more than 900 companies, research institutes and International Organizations***



FG: Open to non-ITU members;

Free of charge;

Physical meetings with remote participation & E-meetings



Diverse management team:

- Government, Industry, Academia, UN agencies
- Africa, Asia, Europe, Americas



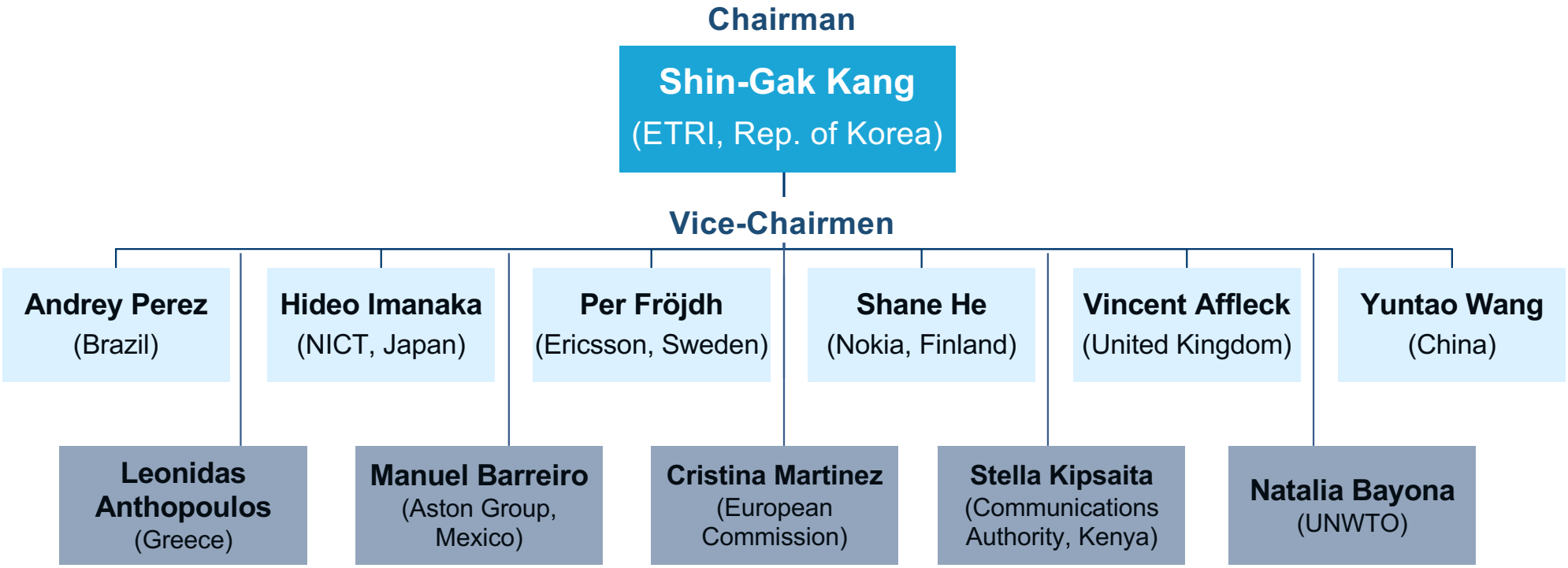
63 Work programs

including Technical Specifications & Reports



More than **500 experts involved in the FG-MV**

FG-MV Management Team



FG-MV Structure

- A unique collaboration platform to shape an open, secure, and interoperable metaverse
- **9 WGs** (Working Groups) and **18 TGs** (Task Groups)



WORKING GROUP 1

General



WORKING GROUP 2

Applications & Services



WORKING GROUP 3

Architecture & Infrastructure



WORKING GROUP 4

Virtual/Real World Integration



WORKING GROUP 5

Interoperability



WORKING GROUP 6

Security, Data & PII Protection



WORKING GROUP 7

Economic, Regulatory & Competition Aspects



WORKING GROUP 8

Sustainability, Accessibility & Inclusion



WORKING GROUP 9

Collaboration

ITU FG-MV meetings – held in different regions

FG-MV Lifetime: December 2022 ~ June 2023 (about 18 months)

Regular FG-MV meetings: held 7 times



500+

Experts involved

1st FG-MV meeting: 8~9 March 2023, Riyadh, Saudi Arabia;
2nd FG-MV meeting: 4~6 July 2023, Shanghai, China;
3rd FG-MV meeting: 3~5 October 2023, Geneva, Switzerland;
4th FG-MV meeting: 4~7 December 2023, Geneva, Switzerland;
5th FG-MV meeting: 5-8 March 2024, Queretaro, Mexico;
6th FG-MV meeting: 30 April 2024, Virtual;
7th FG-MV meeting: 12-13 June 2024, Geneva, Switzerland.

155 WGs/TGs (e)-meetings

Journey of ITU FG-MV and related events



First meeting & 1st ITU Forum "Embracing the metaverse"

8-9 March 2023,
Riyadh, Saudi Arabia



Second meeting & 2nd ITU Forum "Creating a metaverse for all through int. standards"

4-6 July 2023,
Shanghai, China



Special session & 3rd ITU Forum "Cities and the metaverse: Shaping a citiverse for all"

12-13 September 2023,
Arusha, Tanzania



Third meeting

2-5 October 2023,
Geneva, Switzerland



Special Session to promote FG-MV standardization activities

18 October 2023,
Riga, Latvia



Fourth Meeting

4-7 December 2023,
Geneva, Switzerland



ITU-T TSAG meeting

(Allocate 22 Deliverables)

22 - 26 Jan. 2024, Geneva,
Switzerland



Fifth meeting & 4th Forum "Shaping the Citiverse: People-centered cities & virtual worlds"

4-8 March 2024,
Queretaro, Mexico



Sixth meeting

30 April 2024,
Virtual



Seventh meeting & 5th Forum "Integrating virtual and physical worlds in the metaverse with digital twin" & UN Virtual Worlds Day

12-14 June 2024,
Geneva, Switzerland



ITU-T TSAG meeting

(Allocate 30 Deliverables)

29 July - 2 Aug. 2024,
Geneva, Switzerland

ITU FG-MV Work Programs & Deliverables

Total work programs (June 2024): 63

Deliverables approved: 52 (including a definition of metaverse)

- March ~ December 2023: **22**
- January ~ June 2024: **30**

Deliverables unfinished: 11

Allocation of FG-MV deliverables to ITU-T Study Groups by TSAG

- TSAG meeting in January 2024 (22 deliverables)
- TSAG meeting in August 2024 (30 deliverables)

ITU FG-MV's Definition of metaverse

The metaverse is…

An integrative ecosystem of virtual worlds offering immersive experiences to users, that modify pre-existing and create new value from economic, environmental, social and cultural perspectives.

NOTE – A metaverse can be virtual, augmented, representative of, or **associated with the physical world**.

Allocation of FG-MV deliverables to ITU-T SGs (1/4)

No.	Title	TSAG Allocation
FGMV-01	Technical Report on Exploring the metaverse: opportunities and challenges	All for information
FGMV-02	Technical Report on Metaverse: an analysis of definitions	All for information
FGMV-03	Technical Report on Guidelines to assess inclusion and accessibility in metaverse standard development	ITU-T SG16
FGMV-04	Technical Specification on Requirements of accessible products and services in the metaverse: Part I – System design perspective	ITU-T SG16, ITU-T SG9, ITU-T SG20
FGMV-05	Technical Specification on Requirements of accessible products and services in the metaverse: Part II – User perspective	ITU-T SG16, ITU-T SG9, ITU-T SG20, and ITU-T SG2
FGMV-06	Technical Report on Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse	ITU-T SG17
FGMV-07	Technical Report on Policy and regulation opportunities and challenges in the metaverse	ITU-T SG3
FGMV-08	Technical Specification on Design criteria and technical requirements for sustainable metaverse ecosystem	ITU-T SG5 and ITU-T SG20
FGMV-09	Technical Report on Power metaverse: Use cases relevant to grid side and user side	ITU-T SG20 and ITU-T SG13
FGMV-10	Technical Report on Cyber risks, threats, and harms in the metaverse	ITU-T SG17
FGMV-11	Technical Report on Embedding safety standards and the user control of Personally Identifiable Information (PII) in the development of the metaverse	ITU-T SG17 and ITU-T SG11
FGMV-12	Technical Report on Children's age verification in the metaverse	ITU-T SG17
FGMV-13	Technical Report on Responsible Use of AI for Child Protection in the metaverse	ITU-T SG17

Allocation of FG-MV deliverables to ITU-T SGs (2/4)

No.	Title	TSAG Allocation
FGMV-14	Technical Report on Regulatory and economic aspects in the metaverse: Data protection-related	ITU-T SG3 and ITU-T SG17
FGMV-15	Technical Specification on Accessibility requirements for metaverse services supporting IoT	ITU-T SG20 and ITU-T SG16
FGMV-16	Technical Report on Accessibility in a sustainable metaverse	ITU-T SG16
FGMV-17	Technical Report on Guidelines and requirements on interpreting in the metaverse	ITU-T SG16
FGMV-18	Technical Report on Guidance on how to build a metaverse for all – Part I: Legal Framework	ITU-T SG16 and ITU-T SG3
FGMV-19	Technical Specification on Service scenarios and high-level requirements for metaverse cross-platform interoperability	ITU-T SG16, ITU-T SG20, ITU-T SG13 and ITU-T SG11
FGMV-20	Technical Specification – Definition of metaverse	ITU-T SG16
FGMV-21	Technical Report on Principles for Building Concepts and Definitions Related to metaverse	All for Information
FGMV-22	Technical Specification on Capabilities and requirements of Generative Artificial Intelligence in metaverse applications and services	ITU-T SG16
FGMV-23	Technical Report on Considering online and offline implications in efforts to build confidence and security in the metaverse	SG17
FGMV-24	Technical Report on A framework for confidence in the metaverse	SG17
FGMV-25	Technical Report on Near-term and long-term Implications for people in the metaverse	All SGs
FGMV-26	Technical Specification on Requirements for communication between human-avatar languages in the metaverse	SG16 and SG13

Allocation of FG-MV deliverables to ITU-T SGs (3/4)

No.	Title	TSAG Allocation
FGMV-27	Technical Report on Guidelines for metaverse application in power system	SG20
FGMV-28	Technical Specification on Requirements for the metaverse based on digital twins enabling integration of virtual and physical worlds	SG20
FGMV-29	Technical Specification on Reference model for the metaverse based on a digital twin enabling integration of virtual and physical worlds	SG20
FGMV-30	Technical Report on Overview of the application requirements of metaverse on emergency management in chemical industrial parks	SG20
FGMV-31	Technical Specification on Requirements, functional framework and capability of IoT for metaverse	SG20
FGMV-32	Technical Report on Overview of metaverse	All SGs
FGMV-33	Technical Specification on Glossary for metaverse	All SGs, SCV
FGMV-34	Technical Report on Definitions of CitiVerse	SG20
FGMV-35	Technical Report on Building a People-centred CitiVerse	SG20
FGMV-36	Technical Report on The future of travel in the metaverse: landscape and use cases	SG16, SG20
FGMV-37	Technical Report on Landscape and Use cases for the Industrial metaverse	All SGs
FGMV-38	Technical Specification on Framework and requirements for the construction of human-driven 3D digital human application system for metaverse	SG16
FGMV-39	Technical Specification on Use case and requirements for virtual and real fusion coding in metaverse application	SG16

Allocation of FG-MV deliverables to ITU-T SGs (4/4)

No.	Title	TSAG Allocation
FGMV-40	Technical Specification on Multimedia aspect of metaverse architecture	SG16
FGMV-41	Technical Specification on the reference framework of industrial metaverse	SG20
FGMV-42	Technical Report on Interoperability of identity of things across metaverse platforms	SG20
FGMV-43	Technical Specification on High-level interoperability architecture for cross-platform metaverse	SG16
FGMV-44	Technical Report on Security for things across metaverses in aspects of data processing and management	SG17
FGMV-45	Technical Report on Challenges to achieving trustworthy metaverse	SG17
FGMV-46	Technical Report on The essential components of trusted data use in building a trustworthy metaverse	SG17
FGMV-47	Technical Report on Economic Value Creation and Competition in metaverse	SG3
FGMV-48	Technical Report on Guidance on how to build a metaverse for all: Part II - Survey	All SGs
FGMV-49	Technical Report on Metaverse Sustainability: Driving energy efficiency and GHG emissions reduction	SG5
FGMV-50	Technical Specification on Methodology on assessment of GHG emissions of metaverse	SG5
FGMV-51	Technical Report on Standardization roadmap for metaverse	All SGs
FGMV-52	Technical Report on Metaverse standardization landscape for gap analyses	All SGs

Unfinished work items of FG-MV

Type	Title of deliverable	WG/TG
Draft TR	Pre-standardisation roadmap for an inclusive and sustainable CitiVerse	WG1/TG-pre-standardization for the CitiVers
Draft TS	Use cases and requirements on immersive audio coding for metaverse applications and services	WG2/TG-media coding
Draft TS	Requirements and framework for extended reality content creation system based on artificial intelligence	WG2/TG-Generative AI
Draft TR	Use case and requirements for remote amusement service with automatic movable robot (AMR) with multimedia functions on metaverse	WG2/TG-metaverse tourism
Draft TR	Medical metaverse: Use-case Relevant to Medical Training and Hospital	WG2/TG-medical metaverse
Draft TR	Requirements and challenge associated with network infrastructure to enable the metaverse	WG3
Draft TS	Setting the framework for an ICT architecture to enable the metaverse	WG3
Draft TR	The framework of building a trustworthy digital human	WG6/TG-trustworthiness in MV
Draft TS	Incentive strategies to boost high-impact sustainable metaverse applications	WG8/TG-sustainable MV design
Draft TS	Metrics and indicators to drive the design of sustainable metaverse applications	WG8/TG-sustainable MV design
Draft TR	Metaverse social safety: mitigating harassment in the metaverse	WG8/TG-metaverse social safety

*** It needs further consideration at the relevant ITU-T SGs and others.**

FG-MV had been concluded.
But the work is not over yet…



Moving forward to ITU-T SGs & other SDOs

World Telecommunication Standardization Assembly (WTSA-24)

- New Delhi, India, 15 – 24 October 2024

* WTSA is held every four years and defines the next period of study for ITU-T.

All regions of ITU-T proposed a new Resolution on metaverse standardization

- APT – Asia-Pacific Telecommunity
- AST – League of Arab States / Arab Standardization Team
- ATU – African Telecommunications Union
- CEPT – European Conference of Postal and Telecommunications Administrations
- CITEL – Inter-American Telecommunication Commission
- RCC – Regional Commonwealth in the Field of Communications

New Resolution 105 was approved at WTSA-24

❖ **Resolution 105: Promoting and strengthening metaverse standardization**

WTSA-24 Resolution 105

Resolution 105 – Promoting and strengthening metaverse standardization

Resolves;

- to carry out standardization work to ensure that the various telecommunication/ICT components of metaverse can be effectively integrated and interoperated, including architectures, requirements, protocols, systems and services;
- to promote and strengthen the ITU-T SGs' standardization work related to enabling technologies, systems, applications, services, protocols, security, accessibility and sustainability for metaverse;
- to work collaboratively and cooperatively with other SDOs, recognized external organizations, industry and relevant entities;
- to promote the potential of an accessible and sustainable metaverse, including for enhancing the value of future telecommunication/ICT applications and services;
- to take necessary steps to achieve a comprehensive understanding of threats and foster cooperation among different stakeholders to develop a safe and secure metaverse environment that enhances the well-being of users;
- to ensure trust, confidence and security in metaverse applications and services, thereby providing a safe and secure environment for all users;
- to establish a joint coordination activity on metaverse (JCA-MV) under the TSAG to coordinate standardization activities on metaverse and to maintain a standardization roadmap for the purpose of having coordination across relevant ITU-T SGs and with related SDOs and relevant parties outside ITU-T;
- that ITU forums be held to present progress in the work and the results achieved by the ITU-T study groups in charge of metaverse standardization before the next WTSA

Study Period 2025~2028 of ITU-T Study Groups

New structure of ITU-T SGs – consolidation of SG9 and SG16

- 11 SGs (study period 2022~2024) → **10 SGs** (study period 2025~2028)
- **New SG21 - Consolidation of SG9 (CATV) and SG16 (Multimedia)**
  * SG21: Technologies for multimedia, content delivery and cable television

WTSA Resolution 2 was approved

Resolution 2: Scope and mandate of the ITU-T study groups

- General **areas of study** of ITU-T SGs
- **Lead ITU-T Study Groups** in specific areas of study
  * SG20: smart sustainable cities and communities and related digital services, including effective energy management, digital twins and **citiverse**
  * SG21: **immersive multimedia technologies**, including **metaverse**
- **Points of guidance** to ITU-T SGs for the development of the post-2024 work programme

ITU-T SG21 structure on metaverse standardization

- WP1: Integrated broadband and cable television systems
- WP2: Multimedia digital services and human aspects
  - Q1: Multimedia system, service and application accessibility for digital inclusion
  - Q4: Human factors for intelligent user interfaces and services
- WP3: Media authenticity, processing and AI-enabled applications
  - Q5: AI-enabled multimedia applications
- **WP4: Infrastructure for multimedia systems, services and applications, including metaverse**
  - Q8: Immersive live experience systems and services
  - **Q9: Multimedia framework, applications and services, and related metaverse aspects**
- AHG-FQS: Ad hoc Group on future questions structure
- AHG-MMA: Ad hoc Group on coded multimedia authenticity
- **AHG-MV: Ad hoc Group on metaverse → concluded in October 2025**
- IRG-AVA: ITU Intersector Rapporteur Group on Audiovisual Media Accessibility
- JVET: Joint Video Experts Team

Metaverse standardization work items in ITU-T SGs (1/6)

Work items related to General aspects

Work items that address the metaverse as a whole, including terminology, requirements frameworks, accessibility, security, trust, privacy and quality aspects that are not specific to a single application or enabling technology.

SGs	Reference	Title	Status (Timing)
ITU-T SG12	GSTR-MVQ	QoS and QoE standards related to the metaverse	Agreed (2026)
ITU-T SG16	FSTP-ACC-MV-SUST	Accessibility in a sustainable metaverse	Agreed (2024)
ITU-T SG17	X.AA-LLM	Guidelines for Preventing and Mitigating Adversarial Attacks on LLMs in Metaverse and Digital Twin Environments	Under study (TBD)
ITU-T SG17	X.sg-eimv	Security guidelines for enabling integration of virtual and physical worlds of the metaverses in smart city	Under study (TBD)
ITU-T SG17	X.stm-dpm	Security for things across metaverses in aspects of data processing and management	Under study (TBD)
ITU-T SG17	XSTR.cr-mv (ex TR.cr-mv)	Technical Report: Cyber risks, threats, and harms in the metaverse	Under study (TBD)
ITU-T SG17	XSTR.dpama (ex TR.dpama)	Technical Report on " A Landscape analysis for data protection of avatars in metaverse applications"	Under study (TBD)
ITU-T SG17	XSTR.trust-metaverse (ex TR.trust-metaverse)	Technical Report: Technical challenges to achieving trustworthy metaverses	Under study (TBD)
ITU-T SG20	Y.4246 (ex Y.ACC-IoTMV)	Accessibility requirements for metaverse services supporting IoT	Approved (2026)

Metaverse standardization work items in ITU-T SGs (2/6)

Work items related to General aspects

SGs	Reference	Title	Status (Timing)
ITU-T SG21	F.793.1 (ex. F.ACC-MV-SD)	Requirements of accessible products and services in the metaverse- Part I System design perspective	Consented (2026)
ITU-T SG21	F.793.2 (ex. F.ACC-MV-UP)	Requirements of accessible products and services in the metaverse- Part II User perspective	Consented (2026)
ITU-T SG21	FSTR.MV-MML	Maturity levels for metaverse service and application	Agreed (2026)
ITU-T SG21	HSTP-ACC-MV-INTERPR	Guidelines and requirements on interpreting in the metaverse	Under study (TBD)
ITU-T SG21	H.ILE-QR	Quality requirements and influencing factors for immersive live experience (ILE)	Under study (TBD)
ITU-T SG21	J.CLE-ARVR	Terminology, Metrics and Functional requirements for Cognitive Load Estimation for Augmented and Virtual Reality (AR/VR) services	Under study (TBD)
ITU-T SG21	J.ACDN-MIS	Accessibility Capability Discovery and Negotiation for Multimedia and Immersive Services	Under study (TBD)

Metaverse standardization work items in ITU-T SGs (3/6)

Work items related to Application/Service aspects

Work items that work items that define metaverse applications and services for specific industrial or social domains, such as smart cities, industry, education, healthcare, tourism and emergency response.

SGs	Reference	Title	Status (Timing)
ITU-T SG20	Y.CIP	Requirements of metaverse-based emergency response in chemical industrial parks	Under study (TBD)
ITU-T SG20	Y.citiverse-reqts	Requirements of citiverse platform for smart sustainable cities and communities	Under study (TBD)
ITU-T SG20	Y.Fram-ssdp	Requirements and framework of metaverse simulation service for disaster prevention in electric power facilities	Under study (TBD)
ITU-T SG20	Y.Frwk-mwell	Requirements and capability framework for IoT enabled well-being methods measurement through metaverse	Under study (TBD)
ITU-T SG20	Y.Meta-PEH	Requirements and framework of metaverse for IoT-based power equipment hoisting	Under study (TBD)
ITU-T SG20	Y.IECC	Framework and requirements of interactive emergency communication within citiverse	Under study (TBD)
ITU-T SG20	Y.MetaExpSys	Requirements of Metaverse Experience System for Tourist Places	Under study (TBD)
ITU-T SG20	Y.MetaSklSys	Requirements of Metaverse-powered skills Training System for renewable energy plant installations and monitoring	Under study (TBD)
ITU-T SG20	Y.meta-Ed	Requirements and functional architecture for IoT enabled multilingual and immersive education system	Under study (TBD)
ITU-T SG20	Y.4515 (ex Y.IoT-MV)	Functional architecture of IoT for metaverse	Approved (2026)

Metaverse standardization work items in ITU-T SGs (4/6)

Work items related to Application/Service aspects

SGs	Reference	Title	Status (Timing)
ITU-T SG20	Y.PM-FUSG	Technical framework and use cases of the power metaverse for future urban smart grids	Under study (TBD)
ITU-T SG20	Y.4238 (ex. Y.dtmv-reqts)	Requirements for integrating virtual and physical worlds through digital twins in the metaverse	Approved (2025)
ITU-T SG21	F.MRN-CHS	Requirements and framework of mixed reality navigation system for cultural heritage sites	Under study (TBD)
ITU-T SG21	F.740.9 (ex F.IPTV-VRSReqs)	Requirements for enabling VR services based on IPTV architecture	Approved (2025)
ITU-T SG21	FSTR.GM-CAP	Guiding mechanisms for captioning/subtitling and sign language interpreting in immersive media	Agreed (2026)
ITU-T SG21	H.ILE-AMR	Framework of immersive live experience (ILE) using multiple autonomous multimedia-enhanced mobile robots	Under study (TBD)
ITU-T SG21	H.ILE-ISAC-req	Requirements and framework of immersive live experience (ILE) services using integrated sensing and communication	Under study (TBD)
ITU-T SG21	H.ILE-PwD-req	Requirements of Immersive Live Experience (ILE) services for persons with disabilities	Under study (TBD)
ITU-T SG21	HSTP.IMV-CS	Case studies and best practices for industrial metaverse	Under study (TBD)
ITU-T SG21	H.MV-MAMA	Multimedia aspect of metaverse architecture	Under study (TBD)
ITU-T SG21	H.430.9 (ex H.ILE-FT)	An architectural framework for first-person transfer immersive live experience	Approved (2026)

Metaverse standardization work items in ITU-T SGs (5/6)

Work items related to Interoperability & Infrastructure aspects

Work items that work items that define metaverse applications and services for specific industrial or social domains, such as smart cities, industry, education, healthcare, tourism and emergency response.

SGs	Reference	Title	Status (Timing)
ITU-T SG20	Y.citiverse-ai-reqts	Requirements for AI-enabled interoperability in citiverse	Under study (TBD)
ITU-T SG20	Y.4239 (ex. Y.dtmv-ref)	Reference model for integrating virtual and physical worlds through digital twins in the metaverse	Approved (2025)
ITU-T SG20	Y.metaID	Framework and requirements for identity visualization in and across metaverse	Under study (TBD)
ITU-T SG21	F.748.58 (ex F.CEMP-DHS)	Requirements and architectures of multimedia platform for digital human services using edge cloud	Approved (2025)
ITU-T SG11	Q.FITSM	Framework of interoperable telepresence suits for metaverse	Under study (TBD)
ITU-T SG11	Q.SR-TSM	Signalling requirements for interactions between telepresence suits and avatars in the metaverse	Under study (TBD)
ITU-T SG13	Y.3263 (ex Y.trust-MVInf-fr)	Framework of a trustworthy metaverse infrastructure	Consented (2026)
ITU-T SG20	Y.4240 (ex. Y.dtmv-if)	Interoperability for integrating virtual and physical worlds through digital twins for the metaverse	Approved (2025)
ITU-T SG20	Y.4812 (ex Y.mv-iid)	Interoperability of IoT devices' identity across metaverse platforms	Approved (2025)

Metaverse standardization work items in ITU-T SGs (6/6)

Work items related to Interoperability & Infrastructure aspects

SGs	Reference	Title	Status (Timing)
ITU-T SG21	H.MV-FRADAI	Functional requirements and architecture for digital asset interoperability in cross-platform metaverse	Under study (TBD)
ITU-T SG21	H.MV-FRAVI	Functional requirements and architecture for avatar interoperability in cross-platform metaverse	Under study (TBD)
ITU-T SG21	H.770.2 (ex. H.MV-HIA)	High-level interoperability architecture for cross-platform metaverse	Consented (2026)
ITU-T SG21	H.770.1 (ex H.MV-PIOP)	Service scenarios and high-level requirements for metaverse cross-platform interoperability	Approved (2025)

As metaverse standardization work is being carried out by multiple ITU-T SGs, coordination of the work of each SG is required.

ITU-T JCA-MV (metaverse standardization)

* JCA: Joint Coordination Activity

❖ ITU-T SG20 and SG21 meeting (January 2025, Geneva)

- The harmonized ToR for JCA-MV was agreed at the joint meeting of SG20 and SG21
- Draft ToR was submitted to TSAG for consideration

❖ ITU-T TSAG meeting (May 2025, Geneva)

- **Establishment of JCA-MV** was proposed, according to the WTSA Resolution 105
  - ✓ JCA-MV: Joint Coordination Activity on metaverse standardization
- TSAG agreed to **establish a new JCA-MV under TSAG** & the ToR
- **TSAG appointed JCA-MV Co-Chairs**
  - ✓ Shin-Gak KANG (ETRI, Korea), Muath AlRumayh (CST, Saudi Arabia)

ITU-T JCA-MV (metaverse standardization)

❖ Scope

- to **coordinate ITU-T MV standardization work** and **foster collaboration** across all relevant SGs within ITU-T, while providing a visible contact point and coordinating communication with external SDOs, consortia and forums working on metaverse-related standards, enabling effective two-way communications with these bodies.

❖ Objectives

- To ensure that the ITU-T metaverse standardization work related to enabling technologies, systems, applications, services, protocols, security, accessibility, and sustainability for metaverse, progresses in a well-coordinated manner among all relevant ITU-T study groups;
- To encourage relevant groups in ITU-T, the ITU-R and the ITU-D to contribute to the JCA and share information;
- To develop, maintain and update a roadmap for metaverse standardization, taking into account ongoing and published standard deliverables from ITU, other relevant SDOs, consortia, and forums;
- To consider and promote cooperation and complementarity in the development of international standards for metaverse with relevant organizations;
- To report to the TSAG whenever duplication of efforts or other issues requiring coordination are discovered, to support TSAG coordination function among ITU-T study groups;
- To act as a point of contact within ITU-T and with other SDOs, consortia and forums, working on metaverse related standards especially to avoid duplication of efforts;
- To maintain a list of contacts and representatives of relevant ITU-T SGs and other related ITU groups;
- To maintain a list of contacts and representatives from other relevant SDOs, regional/national organizations, consortia, and forums who participate in the JCA-MV.

ITU-T JCA-MV (metaverse standardization)

❖ **Kick-off meeting of the JCA-MV**

- 9 October 2025 (Geneva), collocated with ITU-T SG21 meeting (6 to 17 October 2025)
- Agreed to develop “metaverse standardization roadmap”.
- Sent a liaison statement to numerous SDOs involved in metaverse standardization activities,
  - ✓ informing them of the JCA-MV kickoff meeting results and,
  - ✓ requesting their cooperation in developing the roadmap.

❖ **Second meeting of the JCA-MV**

- 13 May 2026 (Geneva), collocated with ITU-T SG20 meeting (12 to 21 May 2026)
- Developed the updated text of “metaverse standardization roadmap”.
  - based on contributions submitted to the JCA-MV meeting and information on the status of metaverse standardization provided by SDOs.
- Sent a liaison statement to numerous SDOs requesting cooperation and the provision of information on related standardization work, along with a review of the draft roadmap document.

ITU-T JCA-MV (metaverse standardization)

❖ **Third meeting of the JCA-MV**

- 5 August 2026 (virtual meeting)
- Developed the updated text of “metaverse standardization roadmap”.
  - ✓ Latest version: JCA-MV-Doc-009-R1 (Consolidated metaverse standardization roadmap reflecting incoming liaison statements to JCA-MV)
- Sent a Liaison statement to numerous SDOs for continuous roadmap development and collaboration.

❖ **Fourth meeting of the JCA-MV (Planed)**

- 2 December 2026
  - ✓ 12:00 - 15:00 hours, Geneva Time, Virtual
  - ✓ We encourage experts interested in JCA-MV activities to participate in its work.
- TSB Circular 163, 4th meeting of the Joint Coordination Activity on Metaverse Standardization (JCA-MV)
  - ✓ https://www.itu.int/md/T25-TSB-CIR-0163/en

The metaverse continues to evolve and the key is “standardization”.



Details on FG-MV activities and related documents.

https://www.itu.int/en/ITU-T/focusgroups/mv/Pages/default.aspx

Details on JCA-MV activities and related documents.

https://www.itu.int/en/ITU-T/jca/mv/Pages/default.aspx

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