글로벌 ICT 표준 컨퍼런스 2023

Global ICT Standards Conference 2023

(세션 4) 메타버스: 디지털 공간에서의 새로운 기회와 도전

메타버스 국제표준화 동향 및 대응 전략

강신각 본부장 / 한국전자통신연구원

주최 과학기술정보통신부 Ministry of Science and ICT, 특허청 Korean Intellectual Property Office
주관 국립전파연구원 National Radio Research Agency, TTA, IITP, KEA, kista, ETRI

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ITU-T Focus Group on metaverse

Considerations for standardization on Metaverse

About presentation

메타버스 국제표준화 동향 및 대응 전략

메타버스에 대한 전세계적인 관심이 높아가면서 산업 및 서비스 전 분야로 확대되고 있다. 이와 함께 메타버스 플랫폼 및 서비스 연동을 통한 메타버스 생태계 확대 및 이용자 편의성 제공에 대한 필요성이 중요하게 제기되고 있으며, 메타버스 요소기술 및 기반기술 관련 국제표준화 작업이 전세계 주요 표준개발기구에서 적극 추진되기 시작하였다.
이 발표는 최근의 주요 SDO에서의 메타버스 표준화 추진 현황과 국제표준화 대응 전략에 대해 소개한다.

Introduction

INDEPENDENT

NEWS SPORT VOICES CULTURE LIFESTYLE TRAVEL PREMIUM MORE

Culture > Film > Features

Minority Report: 6 predictions that came true, 15 years on

We may be a long way off from the film's dystopian 2054 setting, but a surprising amount of its technologies already exist today

- Voice-controlled Homes
- Driverless Cars
- Personalised Ads
- Facial and Optical Recognition
- Predictive Policing

'Minority Report' 20 Years Later: Which Tech Predictions Were Accurate?

Where are our jetpacks?

Sharon Knolle | June 17, 2022 @ 11:00 AM

- Gesture-based touchscreen interface
- Jetpacks
- Self driving cars
- Robotic surveillance
- Targeted 3D ads

[현장] 마이너리티 리포트가 현실로…LGD, 투명OLED에 미래 담았다

송고 2022.12.23 01:00 | 수정 2022.12.2
EBN 이남석 기자 (leens0319@ebn.co.k

국제

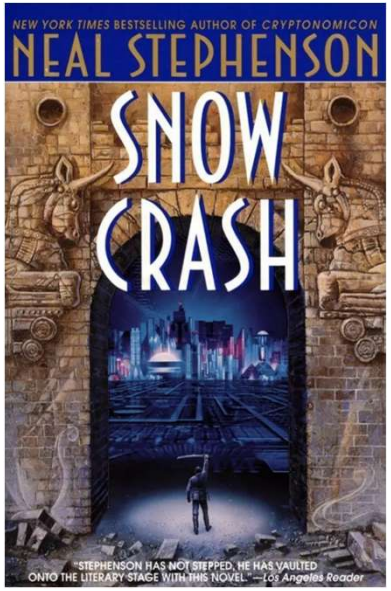
"AI, 범죄발생 7일전 90% 맞췄다"…톰크루즈 마이너리티리포트, 현실로 성큼

전종헌 기자

입력 2022-07-02 15:41:38 수정 2022-07-02 16:15:10

Introduction

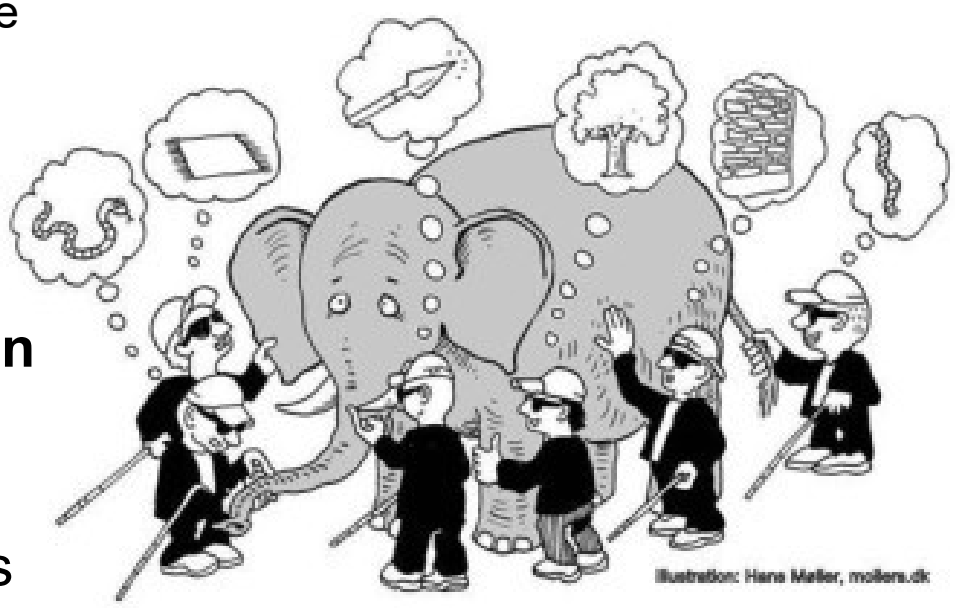
What is the Metaverse ?



- The term "metaverse" **originated in the 1992** science fiction novel Snow Crash as a portmanteau of "meta" and "universe."
- [ASF] “The convergence of 1) virtually enhanced physical reality and 2) physically persistent virtual space.” It is a fusion of both.
  - ASF: Acceleration Studies Foundation, USA
- [Facebook] “The ‘metaverse’ is **a set of virtual spaces** where you can create and explore with other people who aren’t in the same physical space as you.”
- [New York Times] Metaverse is a massive, operable **Real-time rendering 3D virtual world networks**, which can bring synchronous and persistent experience for unlimited number of users, while it also has data continuity, include identity, history, rights, communication, payment, etc.

What is the Metaverse ?

- Other extended view on the Metaverse [in Korea]
  - In a **space** where the virtual and reality converge
  - People or things **interact** with each other
  - **Creating** economic, social, and cultural **values**



- There's **no universally accepted definition** of a real "metaverse."
  - Many SDOs are working on definition
- The **term has grown** beyond Stephenson's 1992 vision of an immersive 3D virtual world.

What is the Metaverse ?

- Some characteristics of the Metaverse

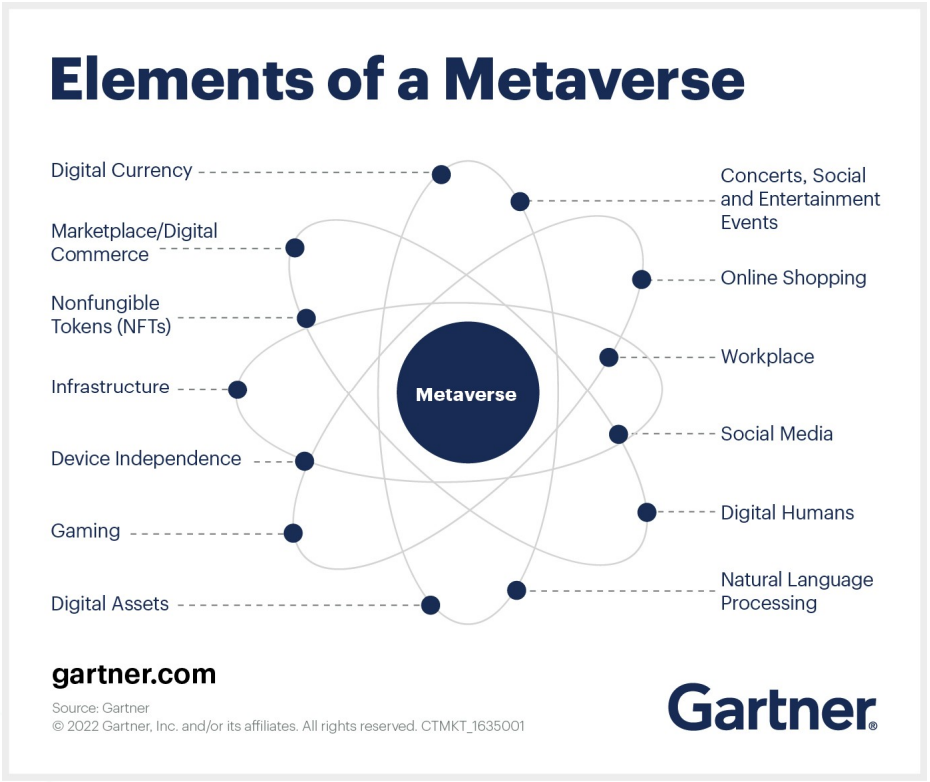
[by Matthew Ball]

- Persistent
- Synchronous and Live
- Without any cap to concurrent users, while also providing each user with an individual sense of “presence”
- Fully functioning economy - produces “value” that is recognized by others
- Experience that spans both the digital & physical worlds
- Offer unprecedented interoperability of data, digital items/assets, content, etc.
- Populated by “content” and “experiences” created and operated by an incredibly wide range of contributors

[by Mark Zuckerberg]

- Presence
- Avatars
- Home Space
- Teleporting
- Interoperability
- Privacy & Safety
- Virtual Goods
- Natural Interface

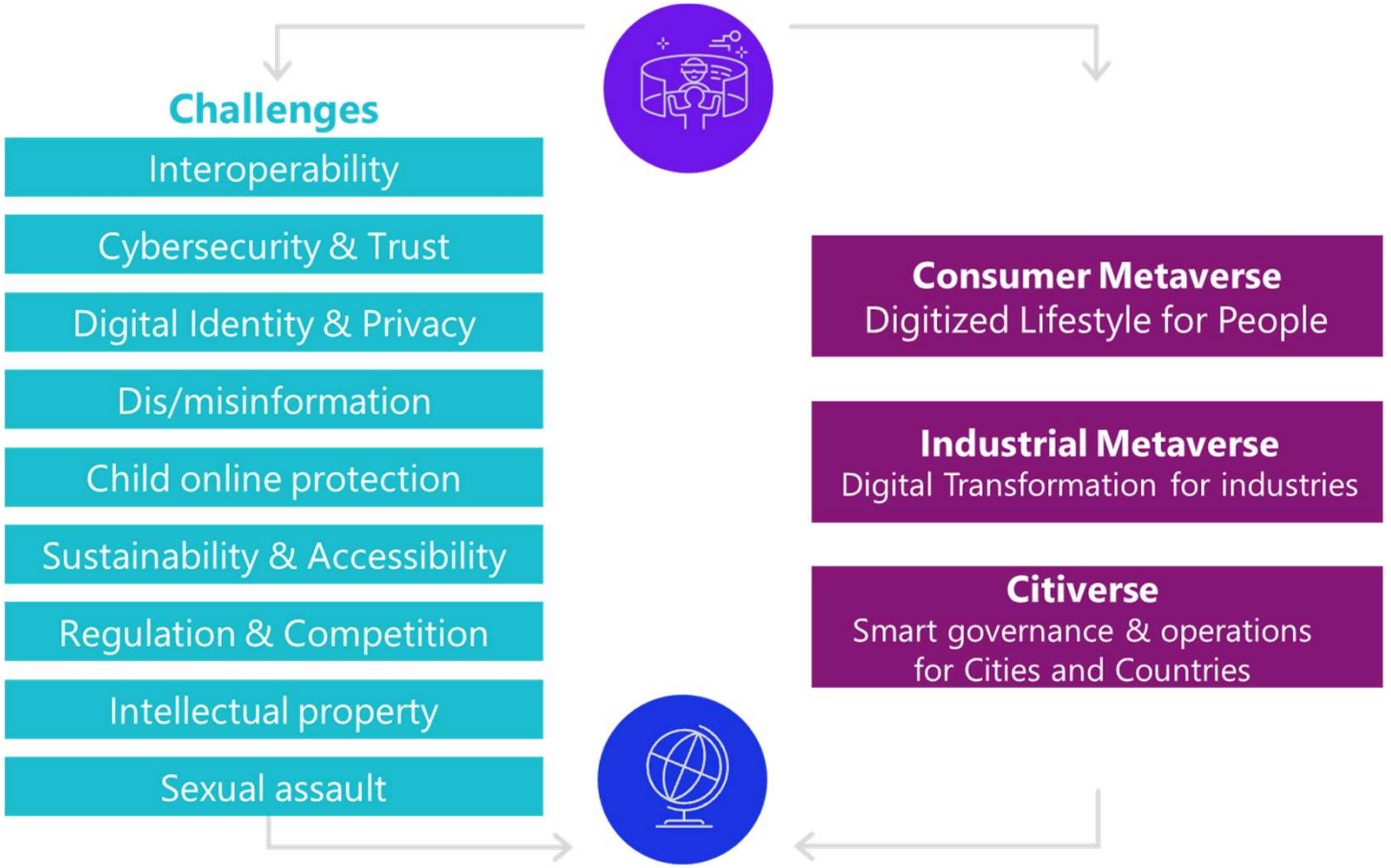
Elements and Underlying Technology of Metaverse



Metaverse is implemented through organic linkage of various ICT technologies such as XR, AI, Data, Network, Cloud, Digital twin, Blockchain, etc.

- XR (eXtended Reality)
- Artificial Intelligence
- Data
- Network
- Cloud
- Digtal Twin
- Blockchain

Opportunities and Challenges



The importance of standards in the metaverse

Support a safe, secure, and regulated metaverse

Ensure that the metaverse is open and accessible to all

Allow for interoperability within the metaverse

Ensure that technologies can work together seamlessly in the metaverse

Standardization activities related to Metaverse

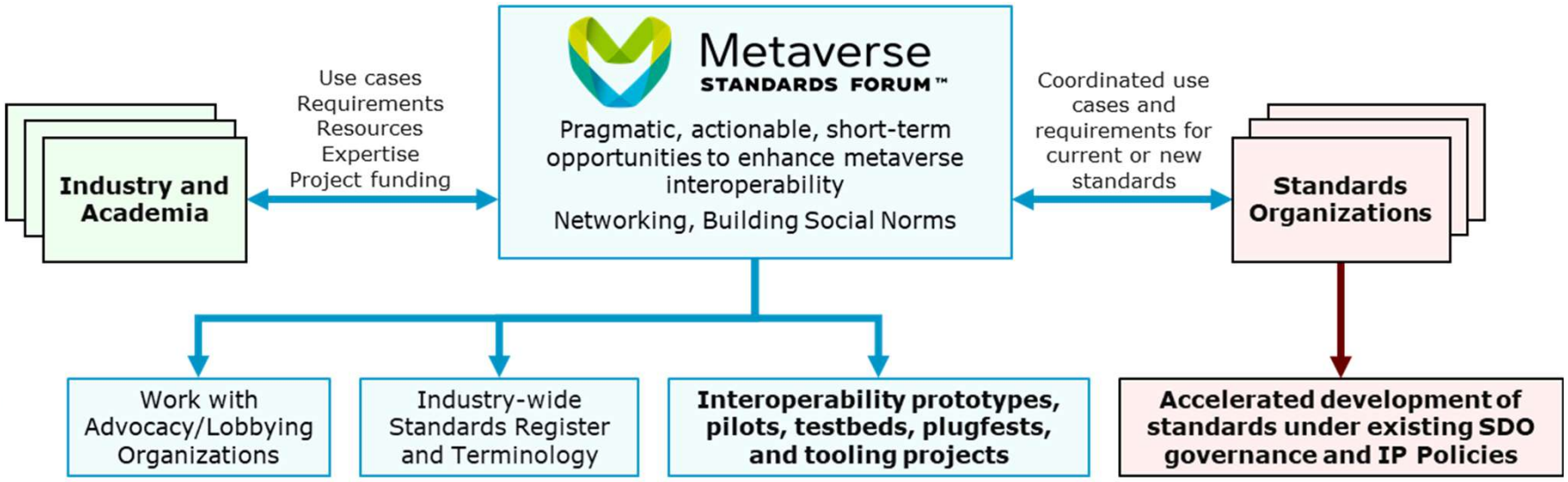
- Promotion of standardization of **element technologies** for Metaverse platform and applications **corresponding to their domains** for each standardization organization
  - **ITU-T SG 16**: Multimedia, Digital human, Immersive systems and Services, Blockchain, AI, etc.
  - **ITU-T SG 17**: Security aspects related to metaverse
  - **ITU-T SG 20**: IoT and smart city aspects related to metaverse
  - **ITU-T FG on metaverse (FG-MV)**
  - **ISO TC 172/SC 9**: Laser and electro-optical systems
  - **ISO TC 133**: Clothing sizing systems - size designation, size measurement methods and digital fittings
  - **ISO TC 133/WG 2**: Digital Fitting
  - **IEC TC 100/WG 12**: Multimedia systems and equipment for metaverse
  - **IEC TC 110/WG 6**: 3D Display Devices
  - **ISO/IEC Joint SEG 15** on Metaverse: Definition, needs and initial roadmap for standardization activities, etc.
  - ISO/IEC **JTC 1/SC 29**: Media-oriented virtual-reality media interworking format, compression, etc.
  - ISO/IEC **JTC 1/SC 24**: 3D Computer Graphics, Mixed Reality, Augmented Reality, etc.
  - ISO/IEC **JTC 1/SC 41**: Internet of Things and digital twin **-- SC 41/WG 6 (Digital Twin)**

- **IEEE 2888 WG**: Interface for Cyber and Physical World, Orchestration of Digital Synchronization between Cyber and Physical World, Holographic Visualization, etc.
- **IEEE 3079 WG**: HMD based VR Sickness Reducing, Mixed Reality for Motion Learning, etc.
- **IEEE 2048 WG:** Standard for Metaverse: Terminology, Definitions and Taxonomy
- **IEEE 7016 WG**: Standard for Ethically Aligned Design and Operation of Metaverse Systems
- **3GPP**: 5G/6G standards have been evolving to support XR and multimedia services with immersive user experiences - Local Metaverse Study Item has been approved in Feb. 2022. in 3GPP SA1(Services WG)
  - ✓ Providing **timely** media to multiple users with sufficiently **low latency and synchronization** to enable services based on **rapid interaction with virtual objects**
  - ✓ TR 22.856, Study on Localized Mobile Metaverse Services (Release 19)
  - ✓ TR 26.998, Support of 5G glass-type Augmented Reality / Mixed Reality (AR/MR) devices
- **IETF** – Side meetings on Metaverse: 1st meeting (‘22.11), 2nd meeting (‘23.03), 3rd meeting (‘23.11)
  - ✓ List address: metaverse@ietf.org
  - ✓ https://mailarchive.ietf.org/arch/browse/metaverse/
  - ✓ https://github.com/giuseppefioccola/Metaverse side-meeting-at-IETF

- **W3C – MICG(Metaverse Interoperability Community Group)**
  - ✓ Bridge virtual worlds by designing and promoting protocols for identity, social graphs, inventory, etc.
- **Khronos Group**: Computer graphics acceleration technology, VR. AR. MR device interface, etc.
  - ✓ glTF™ is a royalty-free specification for the efficient transmission and loading of 3D scenes and models by engines and applications
  - ✓ OpenXR is a royalty-free, open standard that provides high-performance access to Augmented Reality (AR) and Virtual Reality (VR), collectively known as XR, platforms and devices
- **OMI (Open Metaverse Interoperability) Group**
  - ✓ We bolster the metaverse as an open and interoperable resource for anyone, inspired by the collaborative efforts of the community
- **OpenHMD project**: provide a Free and Open Source API and drivers for immersive tech., such as HMDs
- **Open Metaverse Operating System**: providing a common and open source OS for the Metaverse
- **Open Metaverse Foundation (OMF)**: Established under LINUX Foundation (2023.01)
  - ✓ home to an open, vendor-neutral community dedicated to creating **open standards and software** to support the open, global, scalable Metaverse

Metaverse STANDARDS FORUM™ — Fostering interoperability standards for an open metaverse

- Metaverse Standards Forum launched in June 2022 – more than 2,400 members
- **Vision**: A Venue for Cooperation between Standards Organizations and Companies to **foster the development of Interoperability Standards for an Open and Inclusive Metaverse**
- Open to all, no participation fee, no NDA, no IP framework
- Coordinated cooperation between industry and Standards Developing Organizations (SDOs)



KHRONOS GROUP
CONNECTING SOFTWARE TO SILICON

glTF™

glTF RUNTIME 3D ASSET DELIVERY

glTF™ is a royalty-free specification for the efficient transmission and loading of 3D scenes and models by engines and applications. glTF minimizes the size of 3D assets, and the runtime processing needed to unpack and use them. glTF defines an extensible, publishing format that streamlines authoring workflows and interactive services by enabling the interoperable use of 3D content across the industry. glTF 2.0 has been released as the ISO/IEC 12113:2022 International Standard.

관련 프로젝트

glTF 2.0 released as an ISO/IEC International Standard

Project Explorer

cognition and adoption as a 3D asset format

Search by Title or Description

Filter Results

Selected Filters

Filter by Tags

Filter by Task

Filter by Type

glTF Validator

Khronos glTF Sample Viewer

Khronos Group Blender Importer/Exporter

BabylonJS glTF loader

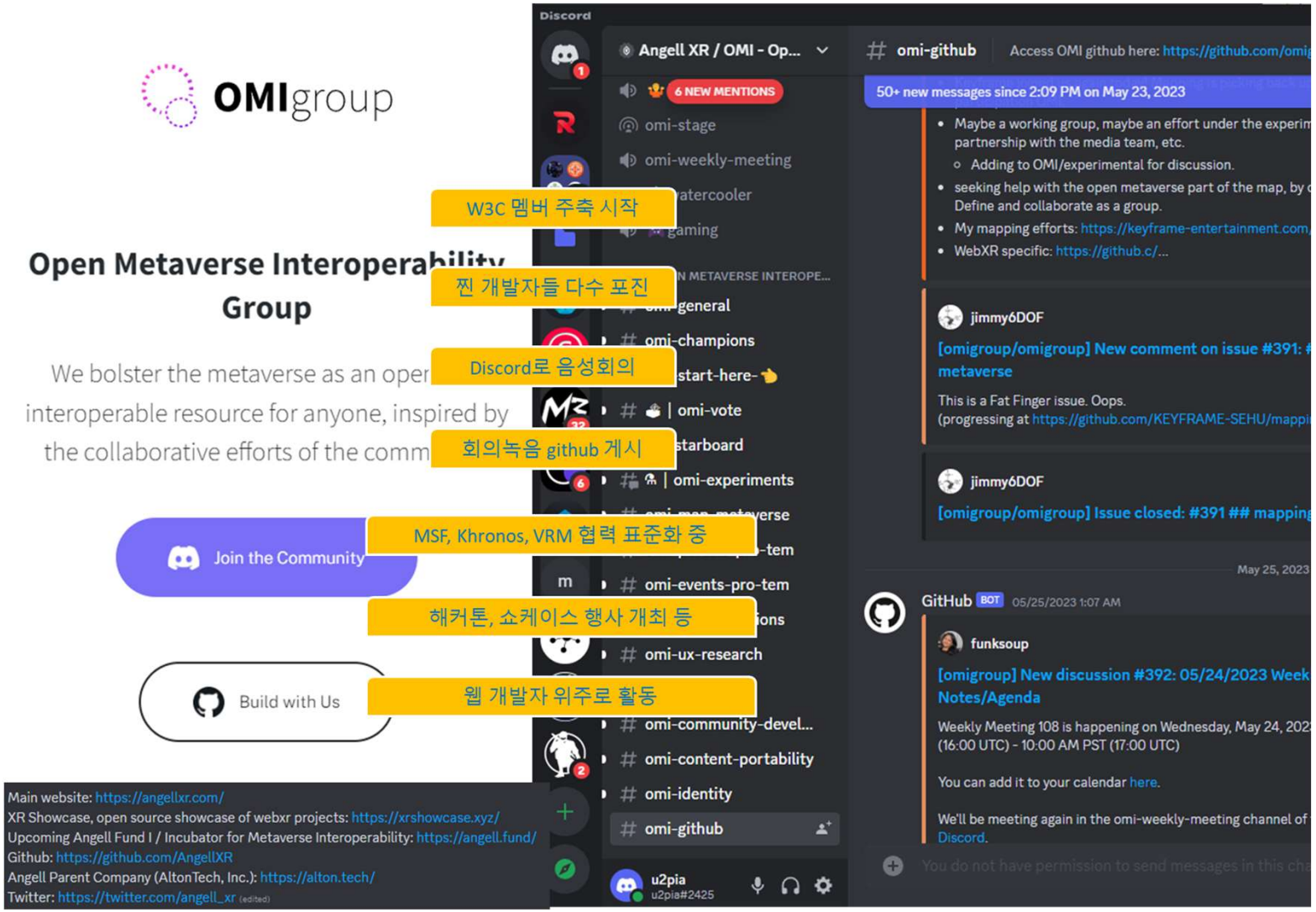
OMI glTF Extensions

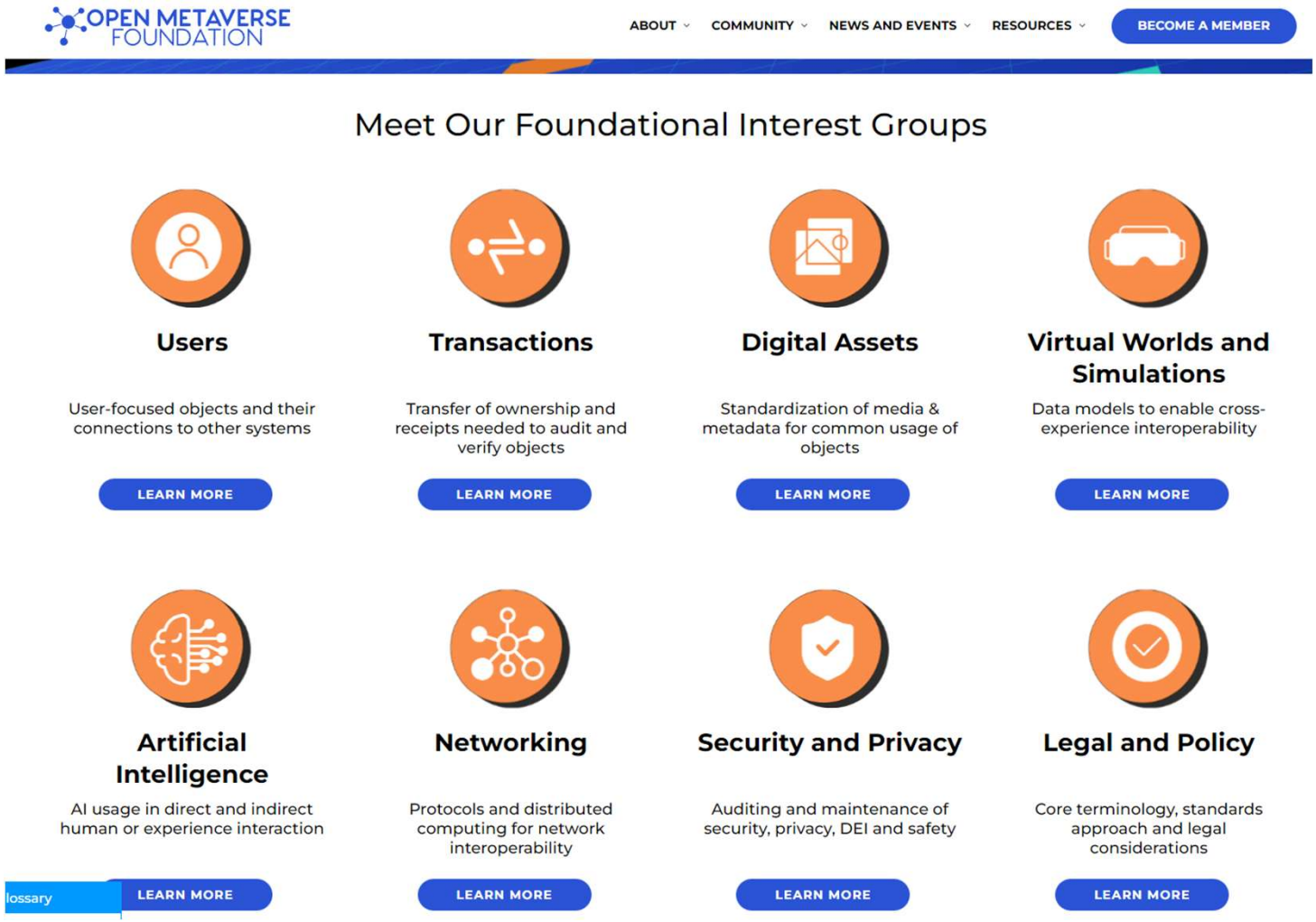
This repository is used by the Open Metaverse Interoperability Group to develop and document extensions for the glTF 3D transmission format.

Metaverse에서 대세 3D 파일 포맷으로 자리매김 중

Extensions in this repository are intended to extend the glTF format with features useful for 3D virtual worlds. These extensions could include things related audio, physics, avatars, animations, behaviors, and more.

Vendor extensions are developed and approved via the W3C Metaverse Interoperability Community Group process. Our intentions are to create OMI specific vendor extensions, but common extensions that make sense within the greater glTF community may be proposed to the Khronos 3D Formats Working Group at a later date. Our goal with this repository is to prototype and standardize extensions useful for the portability of 3D metaverse media.


OMIgroup
Open Metaverse Interoperability Group
We bolster the metaverse as an oper
interoperable resource for anyone, inspired by
the collaborative efforts of the comm
Join the Community
Build with Us
W3C 멤버 주축 시작
찐 개발자들 다수 포진
Discord로 음성회의
회의녹음 github 게시
MSF, Khronos, VRM 협력 표준화 중
해커톤, 쇼케이스 행사 개최 등
웹 개발자 위주로 활동
Discord
Angell XR / OMI - Op...
6 NEW MENTIONS
omi-stage
omi-weekly-meeting
gaming
omi-general
omi-champions
omi-vote
omi-experiments
omi-events-pro-tem
omi-ux-research
omi-community-devel...
omi-content-portability
omi-identity
omi-github
u2pia
u2pia#2425
omi-github
Access OMI github here: https://github.com/omig
50+ new messages since 2:09 PM on May 23, 2023
Maybe a working group, maybe an effort under the experim
partnership with the media team, etc.
Adding to OMI/experimental for discussion.
seeking help with the open metaverse part of the map, by
Define and collaborate as a group.
My mapping efforts: https://keyframe-entertainment.com
WebXR specific: https://github.c/...
jimmy6DOF
[omigroup/omigroup] New comment on issue #391:
metaverse
This is a Fat Finger issue. Oops.
(progressing at https://github.com/KEYFRAME-SEHU/mappi
jimmy6DOF
[omigroup/omigroup] Issue closed: #391 ## mapping
May 25, 2023
GitHub BOT 05/25/2023 1:07 AM
funksoup
[omigroup] New discussion #392: 05/24/2023 Week
Notes/Agenda
Weekly Meeting 108 is happening on Wednesday, May 24, 202
(16:00 UTC) - 10:00 AM PST (17:00 UTC)
You can add it to your calendar here.
We'll be meeting again in the omi-weekly-meeting channel of
Discord.
Main website: https://angellxr.com/
XR Showcase, open source showcase of webxr projects: https://xrshowcase.xyz/
Upcoming Angell Fund I / Incubator for Metaverse Interoperability: https://angell.fund/
Github: https://github.com/AngellXR
Angell Parent Company (AltonTech, Inc.): https://alton.tech/
Twitter: https://twitter.com/angell_xr (edited)


OPEN METAVERSE FOUNDATION
ABOUT
COMMUNITY
NEWS AND EVENTS
RESOURCES
BECOME A MEMBER
Meet Our Foundational Interest Groups
Users
User-focused objects and their connections to other systems
LEARN MORE
Transactions
Transfer of ownership and receipts needed to audit and verify objects
LEARN MORE
Digital Assets
Standardization of media & metadata for common usage of objects
LEARN MORE
Virtual Worlds and Simulations
Data models to enable cross-experience interoperability
LEARN MORE
Artificial Intelligence
AI usage in direct and indirect human or experience interaction
LEARN MORE
Networking
Protocols and distributed computing for network interoperability
LEARN MORE
Security and Privacy
Auditing and maintenance of security, privacy, DEI and safety
LEARN MORE
Legal and Policy
Core terminology, standards approach and legal considerations
LEARN MORE
lossary

Global ICT Standards Conference 2023
글로벌 ICT 표준 컨퍼런스 2023

ITU-T Focus Group on metaverse: Exploring metaverse standardization

Shin-Gak KANG
Chairman, ITU Focus Group on metaverse

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

Open to non-ITU members;

Free of charge;

Physical meetings with remote participation & E-meetings

Diverse management team:

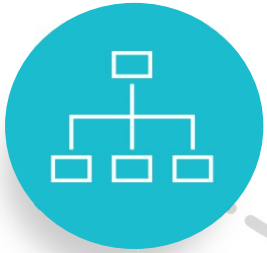
- Government, Industry, Academia, UN agencies
- Africa, Asia, Europe, Americas

60+ planned deliverables (5 Oct. 2023), including Technical Specifications & Reports

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

The 1st FG-MV meeting broke the record!
(8-9 March 2023, Riyadh. Kingdom of Saudi Arabia)

Most attended ITU Focus Group meeting with over 650 participants!



FG-MV Management Team

Government, industry, academia, UN agencies, Asia, Africa, Europe, the Americas

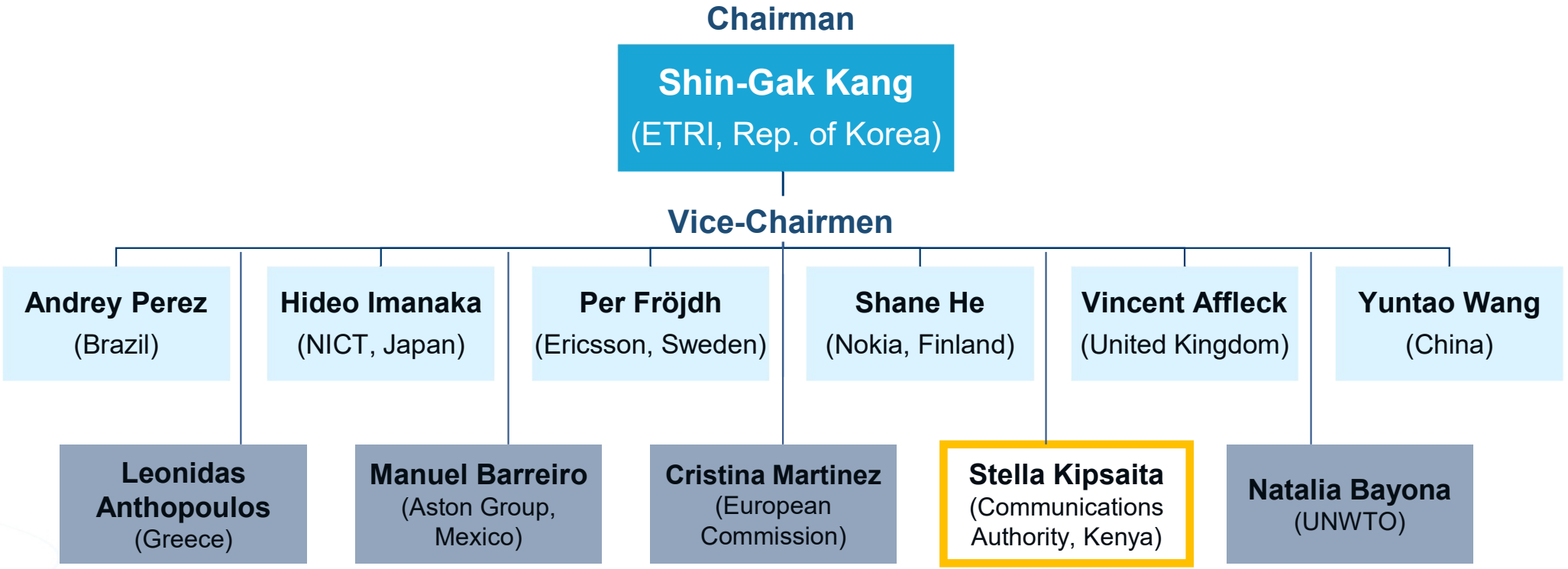
FG-MV Structure established

8 Working Groups and 10 Task Groups

Work Plan agreed

18 new work items were created and are moving fast!

ITU FG-MV Management Team



Outcome of the 2nd FG-MV meeting (4-6 July 2023, Shanghai, China)

The **1st time** that a deliverable has been approved at the 2nd Focus Group meeting.

- Technical Report, "**Exploring the metaverse: opportunities and challenges**"

The Focus Group meeting, was attended by **more than 2,000 participants** on-site and online, which broke the record set by the first FG-MV meeting.

39 new work items have been approved.

- Currently, total 57 on-going work items

1 new Working Group and 10 new Task Groups have been approved

FG-MV encouraged ITU to organize a **UN Metaverse Week** in 2024.

FG-MV encouraged ITU to establish a **Digital Coalition on CitiVerse**.

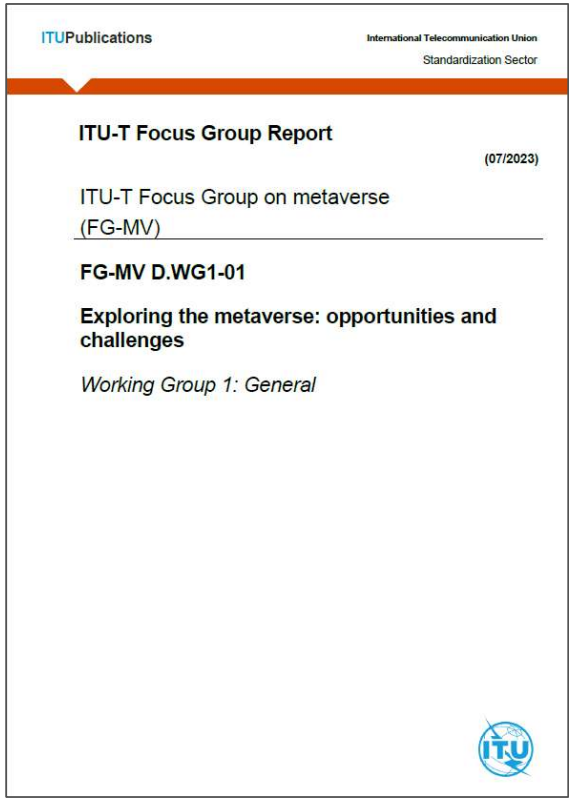
- TSB was requested to follow up on these actions and to report back to the next FG-MV meeting

1st FG-MV Technical Report
"Exploring the metaverse: opportunities and challenges"

Unanimously approved at the 2nd FG-MV meeting

- Opportunities and challenges
- The role of international standards
- The potential for the metaverse in the achievement of the United Nations Sustainable Development Goals.

Download at: ***https://www.itu.int/pub/T-FG-MV-2023***


ITUPublications
International Telecommunication Union
Standardization Sector

ITU-T Focus Group Report
(07/2023)

ITU-T Focus Group on metaverse (FG-MV)

FG-MV D.WG1-01

Exploring the metaverse: opportunities and challenges

Working Group 1: General

FG-MV latest structure (approved at the 2nd FG-MV meeting)

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 G ROUP 9

Collaboration

Outcome of the 3rd FG-MV meeting (3~5 October, 2023)

- Second ITU-T FG-MV meeting was held in Geneva, Switzerland
- The Focus Group meeting, was attended by **more than 248 participants** on-site and online. ** China's big holiday…*
- **8 draft deliverables** have been approved
- **9 new work items** have been approved
  - Current work items : 57 (Total 66: 9 WIs have been completed)
- **18 planned draft deliverables for approval** during the 4th FG-MV meeting in December 2023 have been identified (Tentative plan)

Approved Deliverables

WGs	Type	Title of deliverable
WG1 - General	Technical Report	Metaverse: an analysis of definitions
WG2 - Applications & Services	Technical Report	Power metaverse: Use cases relevant to grid side and user side
WG6 - Security, Data & Personally identifiable information (PII) Protection	Technical Report	Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse
WG7 - Economic, regulatory & competition aspects	Technical Report	Policy and regulation opportunities and challenges in the metaverse
WG8 - Sustainability, Accessibility & Inclusion	Technical Report	Guidelines to assess inclusion and accessibility in metaverse standard development
	Technical Specification	Requirements of accessible products and services in the metaverse: Part I – System design perspective
	Technical Specification	Requirements of accessible products and services in the metaverse: Part II – User perspective
	Technical Specification	Design criteria and technical requirements for sustainable metaverse ecosystems

Approved New Work Items

WGs	Type	Title of deliverable
WG1 - General	Technical Report	Definitions relating to confidence in the metaverse
	Technical Report	Building a People-centred CitiVerse
	Technical Specification	Definition of metaverse
	Technical Specification	Definition of CitiVerse
WG2 - Applications & Services	Technical Report	Use Cases for the Industrial metaverse
WG3 - Architecture & Infrastructure	Technical Specification	Multimedia aspect of metaverse architecture
WG8 - Sustainability, Accessibility & Inclusion	Technical Report	Guidance on accessibility of Web3 economy layer of the metaverse for women
WG9 - Collaboration	Technical Report	Standardization roadmap for metaverse
	Technical Report	Gap analysis on metaverse standardization

Structure of FG-MV - WGs/TGs (October 2023)

Working Groups	Task Groups
WG1 - General	• TG on **Terminology & definitions**
	• TG on **implications for people** in the metaverse
	• TG on pre-standardization for the **CitiVerse**
WG2 - Applications & Services	• TG on Media coding
	• TG on **Generative Artificial Intelligence** in the metaverse
	• TG on **Embodied Artificial Intelligence** for metaverse
	• TG on **Medical** metaverse
	• TG on metaverse **Tourism**
	• TG on **Power** metaverse
	• TG on **Industrial** metaverse
WG3 - Architecture & Infrastructure	
WG4 - Virtual/Real World Integration	

Structure of FG-MV - WGs/TGs (October 2023)

Working Groups	Task Groups
WG5 - Interoperability	
WG6 - Applications & Services	• TG on **Cybersecurity**
	• TG on **Building confidence and security** in the metaverse
	• TG on **Child online protection**
	• TG on **Issues on trustworthiness** related to the metaverse
WG7 - Economic, regulatory & competition aspects	
WG8 - Sustainability, Accessibility & Inclusion	• **Sustainability**
	• **Accessibility & inclusion**
	• **Design criteria and metrics with incentives for sustainable metaverse**
	• Metaverse **social safety**
WG9 - Collaboration	• **Gap analysis**

Current Work Items (5 October, 2023)

FG	Template	Use case template
WG1	TS	Overview of metaverse
	TR [Approved, '23.07]	Exploring the metaverse: opportunities and challenges
	TS	Vocabulary for metaverse
	TR	Principles and Processes for Building Concepts and Definitions Related to metaverse
	TR [Approved, '23.10]	Metaverse: An analysis of definitions
	TS	Definitions relating to confidence in the metaverse
	TS	Definition of metaverse
	TS	Definition of CitiVerse
	TR	Pre-standardisation roadmap for an inclusive and sustainable CitiVerse
	TR	Building a People-centred CitiVerse
	TR	Near-term and Long-term Implications of People in the metaverse
WG2	TR	Overview of the application requirements of metaverse on emergency management in chemical industrial parks
	TS	Use case and requirements for virtual and real fusion coding in metaverse application
	TS	Use cases and requirements on immersive audio coding for metaverse applications and services
	TS	Framework and requirements for the construction of 3D manual driven digital human application system based on image recognition algorithm
	TS	Use cases and requirements for Generative AI in metaverse applications and services

WG2	TS	Requirements and framework for extended reality content creation system based on artificial intelligence
	TR	Medical metaverse: Use-case Relevant to Medical Training and Hospital
	TR	Guidelines and use cases on tourism in the metaverse
	TR	Use case and requirements for remote amusement service with automatic movable robot (AMR) with multimedia functions on metaverse
	TR [Approved, '23.10]	Power metaverse: Use Cases Relevant to Grid Side and User Side
	TS	Guidelines for metaverse application in energy power
	TR	Use Cases for the industrial metaverse
WG3	TR	Requirements and challenge associated with network infrastructure to enable the metaverse
	TS	Requirements and functional architecture of IoT- based metaverse service
	TS	Reference architecture of industrial metaverse
	TS	Setting the framework for an ICT architecture to enable the metaverse
	TS	Multimedia aspect of metaverse architecture
WG4	TS	Use cases and requirements for the metaverse based on digital twins enabling integration of virtual and physical worlds
	TS	Reference model for the metaverse based on a digital twin enabling integration of virtual and physical worlds

WG5	TS	Service scenarios and high-level requirements for metaverse cross-platform interoperability
	TS	High-level interoperability architecture for cross-platform metaverse
	TS	Interoperability of identity of things across metaverses
WG6	TR	Requirements and framework for digital identity system
	TS	Data management and security for things across metaverses
	TR	Risks, threats and potential harms in the metaverse
	TS	Security Framework for the Metaverse Architecture
	TS	Identity management Security guidelines in the metaverse
	TS	Guidelines for security management of using metaverse applications
	TS	Asset management Security guidelines in the Metaverse
	TR [Approved, '23.10]	Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse
	TR	Embedding safety standards and the user control of Personally Identifiable Information (PII) in the development of the metaverse
	TR	Responsible use of AI for child protection in the metaverse
	TS	Children age verification in the metaverse
	TR	Extended reality and children: key issues and recommendations for government stakeholders, including policymakers and regulators, and technology companies
	TR	Trustworthy Metaverse
	TS	The framework of building a trustworthy digital human

WG7	TS	Economic Value Creation and Competition in metaverse
	TR	Regulatory and economic aspects in the metaverse: Data protection-related
	TR [Approved, '23.10]	Policy and regulation challenges of the metaverse
WG8	TS	Guidance on green and low carbon development of metaverse
	TS	Accessibility requirements for metaverse services supporting IoT
	TR	Interpreting in the metaverse
	TR [Approved, '23.10]	Guidelines to assess inclusion and accessibility in metaverse standards development
	TS [Approved, '23.10]	Requirements of accessible products and services in the metaverse: Part I – System design perspective
	TS [Approved, '23.10]	Requirements of accessible products and services in the metaverse: Part II – User perspective
	TR	Accessibility for a sustainable metaverse
	TR	Guidance on how to build a metaverse for all
	TR	Guidance on accessibility of Web3 economy layer of the metaverse for women
	TS	Use of metaverse as a mitigation strategy for people with cognitive development difficulties in flood regions
	TS [Approved, '23.10]	Requirements and design criteria for sustainable metaverse systems
	TS	Incentive strategies to boost high-impact sustainable metaverse applications
	TS	Metrics and indicators to drive the design of sustainable metaverse applications
	TR	Metaverse social safety: mitigating harassment in the metaverse
WG9	TR	Standardization roadmap for metaverse
	TR	Gap analysis on metaverse standardization

Roadmap of FG-MV and Forum

1st ITU Forum on "Embracing the metaverse" (10 Mar.)

First meeting
8-9 March 2023,
Riyadh, Saudi Arabia

Second meeting
4-6 July 2023,
Shanghai, China

2nd ITU Forum on "Creating a metaverse for all through international standards" (7 July)

3rd ITU Forum on "Cities and the metaverse: Shaping a citiverse for all" (13 Sep.)

Special session
12 September 2023,
Arusha, Tanzania

Third meeting
3-5 October 2023,
Geneva, Switzerland

Special session
18 October 2023,
Riga, Latvia

Fourth meeting
4-7 December 2023,
Geneva, Switzerland

***Special Sessions** on FG-MV is to promote FG-MV standardization activities.*

Fifth meeting & 4th Forum
4-8 March 2024, Queretaro, Mexico

Future Plan of ITU-T FG-MV

- **Fourth meeting** of FG-MV: 4-7 December 2023, Geneva, Switzerland
  - 18 planned draft deliverables for approval (Tentative)
  - **Proposal for extension of FG-MV life time with updated ToR**: one more year (until March 2025, TBC)
  - Preparation of FG-MV deliverables for submitting to TSAG
- **TSAG meeting** (Jan. 2024, Geneva) : Discuss and **approve the continuation of FG-MV**
- **Fifth meeting** of FG-MV: 4-8 March 2024, Queretaro, Mexico
  - Last meeting of FG-MV during its first life time
- **Second life time of FG-MV** (from April 2024)
  - Restructuring of FG-MV working group structure
  - Establish work plans for developing deliverables
  - Setup plan to transfer the outputs/ongoing works of FG-MV to relevant ITU-T SGs

Join us! – Let's shape the future of the metaverse!

FG-MV

Recently, metaverse has become one disruptive area of innovation with great potential to change our economy, way of living and communicating and society. In this nascent phase of the metaverse, the industry has not converged towards common terms and definitions. The metaverse concept has attracted considerable public attention.

The ITU Focus Group on metaverse was established under TSAG on 16 December 2022. The group will analyse the technical requirements of the metaverse to identify fundamental enabling technologies in areas from multimedia and network optimization to digital currencies, Internet of Things, digital twins, and environmental sustainability.

It will also provide a collaboration platform for dialogue, for identifying stakeholders with whom ITU-T could collaborate, and for enabling the inclusion of non-members to contribute to the technical pre-standardization work. The Focus Group work will be enriched with the identification of relevant use cases.

The **FG-MV Workplan** including the FG-MV structure, the list of deliverables along with information concerning the designated Chairmen and Vice-Chairmen for the Working Groups (WGs) and Task Groups (TGs) is available here.

Participation in the Focus Group is **open to any interested stakeholder willing to contribute** — to sign up, please join our mailing list!

Parent Group: TSAG

- Terms of reference
- A.7- Focus groups: Establishment and working procedures
- Press release

Meetings and related events | Templates | Past Meetings

4th FG-MV Meeting
Geneva, Switzerland, 4-7 December 2023

- Announcement
- Registration
- Draft agenda
- Meeting room allocation
- Remote participation platform
- Documents
- **Deadlines:**
  - **Visa support letters:** 3 November 2023
  - **Contributions:** 21 November 2023 (Submit written contributions (by e-mail to tsbfgmv@itu.int)
  - **Pre-registration:** 27 November 2023
- Practical information
- Report

The report of the third meeting of the Focus Group on metaverse (FG-MV)(Geneva, Switzerland, 3-5 October 2023) is available here.

Upcoming events | Past events | Videos

- **Working Group and Task Group meetings**
- The list of Working Group and Task Group meetings and e-meetings is available here.
- **Planned Focus Group on metaverse (FG-MV) Meetings & Special Sessions of the FG-MV**
- **2nd Special session on FG-MV** (Riga, 18 October 2023)
- 4th FG-MV meeting (Geneva, 4-7 December 2023)

MANAGEMENT TEAM AND CONTACTS

Chairman:

- Shin-Gak Kang (ETRI, Rep. of Korea)

Vice-Chairmen:

- Andrey Perez (Brazil)
- Hideo Imanaka (NICT, Japan)
- Per Fröjdh (Ericsson, Sweden)
- Shane He (Nokia, Finland)
- Vincent Affleck (United Kingdom)
- Yuntao Wang (China)
- Leonidas Anthopoulos (University of Thessaly, Greece)
- Manuel Barreiro (Aston Group, Mexico)
- Cristina Martinez (European Commission)
- Stella Kipsaita (Communications Authority, Kenya)
- Natalia Bayona (World Tourism Organization (UNWTO))

Secretariat:

- Cristina Bueti, Counsellor
- Yining Zhao, Junior Communication Officer
- Chiara Co, Secretariat
- Bohan Leng, Intern
- Email: tsbfgmv@itu.int

APPROVED ITU FG-MV DELIVERABLES

- Technical Report ITU FGMV-01 - Exploring the metaverse: opportunities and challenges
- Technical Report ITU FGMV-02 - Metaverse: an analysis of definitions
- Technical Report ITU FGMV-03 - Guidelines to assess inclusion and accessibility in metaverse standard development
- Technical Specification ITU FGMV-04 - Requirements of accessible products and services in the metaverse: Part I – System design perspective
- Technical Specification ITU FGMV-05 - Requirements of accessible products and services in the metaverse: Part II – User perspective
- Technical Report ITU FGMV-06 - Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse
- Technical Report ITU FGMV-07 - Policy and regulation opportunities and challenges in the metaverse
- Technical Specification ITU FGMV-08 - Design criteria and technical requirements for sustainable metaverse ecosystems
- Technical Report ITU FGMV-09 - Power metaverse: Use cases relevant to grid side and user side

More information available here.

MAILING LISTS

- **Collaboration site:**
  - Documents are available at the Collaboration site (A free ITU Account is required to access relevant documentation and participate).
- **Mailing lists:**
  - List of FG-MV, Working Groups and Task Groups mailing lists
    - WG1 - General
      Mailing list: fgmv-wg1@lists.itu.int
    - WG2 - Applications & Services
      Mailing list: fgmv-wg2@lists.itu.int
    - WG3 - Architecture & Infrastructure
      Mailing list: fgmv-wg3@lists.itu.int
    - WG4 - Virtual/Real World Integration
      Mailing list: fgmv-wg4@lists.itu.int
    - WG5 - Interoperability
      Mailing list: fgmv-wg5@lists.itu.int
    - WG6 - Security, Data & Personally identifiable information (PII) Protection
      Mailing list: fgmv-wg6@lists.itu.int
    - WG7 - Economic, regulatory & competition aspects
      Mailing list: fgmv-wg7@lists.itu.int
    - WG8 - Sustainability, Accessibility & Inclusion
      Mailing list: fgmv-wg8@lists.itu.int
    - WG9 - Collaboration
      Mailing list: fgmv-wg9@lists.itu.int
  - Please subscribe to the FG-MV mailing list (fgmv@lists.itu.int) to receive news, updates, invitations, and access the e-meetings:
    - Sign up for a (free) ITU account, if you do not already have one.
    - Account holders log in here: select the mailing list >click *subscribe*.
    - To view previous exchanges on this mailing list, visit the mailing list archive.
    - Step by step instructions

Considerations for standardization on Metaverse

- **Understand the diversity of technical issues of metaverse** including policy, regulation and other social effect
- **Identify the SDO best suited** to drive standardization works for the target items/issues
- Need to know **how to use various meeting platforms** and **prepare for on-line presentations and discussions** since most meetings of many SDOs are held in e-meetings
- Actively **utilize the advantages of the standardization group led by Korea** as much as possible, for example ITU-T FG-MV, and other Groups
  - FG-MV is currently the most active standardization group on various metaverse issues
  - FG-MV is the representative group discussing **platform-level interoperability** issues
- **Take advantage of relatively low barriers of ITU-T FG-MV** to develop new standard document
- Consideration of **future structure & works in the new study period of ITU-T SGs** (2025~2028)
  - Each SG is working on revising the detailed RG structure and its ToR to accommodate metaverse standardization work
- Political support to **continue to lead metaverse standardization** and **keep leadership positions**

감사합니다.

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