Establishment of a new SEG on Metaverse

IEC National Committee of China

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CONTENTS

1 Industry background

2 Standardization needs

3 Recommendations for a SEG

Metaverse is comming

What is Metaverse

Thoughts from the Internet		
1	Science friction《Snow Crash》	Metaverse is a virtual world that is drawn from the real world, parallel to the real world and has interplay with the real world. It can’ t get offline.
2	Wikipedia	It is a immersive and universal physical reality by the use of virtual reality. It is a 3D virtual space with social connections and sharing based on the future Internet.
3	《Oxford English Dictionary》	A virtual reality space， users may interact with the other users with the computer generated environment.

Academic Thoughts		
13	Peking University- Gang Chen	Metaverse is a virtual world linked and created with technology. It is reflected and interacted with the real world. It is a digital living space with modern social system.
14	Tsinghua University - Yang Shen	Metaverse is the next generation Internet application and social form produced by various new technologies. It realizes space-time expansion with AR and digital twin. It realizes a human-machine integration of virtual human, natural human and robot based on AI and IoT. Metaverse adds economic value with the help from blockchain, Web3.0, digital collection / NFT, etc
15	Tsinghua University & Chinese Academy of Engineering academician - Weimin zheng	Metaverse not only includes 5G, AI, blockchain, cloud computing and Big Data from the digital economy, but also integrates forward-looking layout of VR, AR, brain computer interface, IoT and other technologies. Metaverse is a world composed of data. Distributed data storage becomes the way to maintain the permanent operation of Metaverse.
16	Chinese Academy of Social Sciences - Pengfei Zuo	In terms of space-time, Metaverse is a virtual digital world in the space dimension yet a real digital world in the time dimension; In terms of reality, there are both digital replicates from the real world and creations from the virtual world in the Metaverse.

Thoughts within the industry		
4	Meta CEO- Mark Elliot Zuckerberg	Metaverse is an upgraded version of the mobile Internet. It integrates virtual reality technology and uses exclusive hardware equipment to create a social platform with a strong sense of immersion.
5	Microsoft CEO - Satya Nadella	Metaverse is essentially a game, which can put people, places and things into a physical engine and they interact with each other.
6	Author of 《The Metaverse》- Matthew Ball	Metaverse is a large, interoperable network composed of a real-time rendered 3D virtual world, which can be synchronously and continuously experienced by an effective and unlimited number of users, with a sense of personal existence and data continuity, such as identity, history, rights, goods, communication and payments.
7	Nvidia - Richard Kerris	Metaverse is a broad description of many types of virtual worlds. So far it is a kind of Internet evolution.
8	Roblox - Dave Baszucki	A lasting online world that provides participants a wide range of experiences and a chance to express themselves.
9	Tencent	Metaverse is a virtual digital world that is independent of the real world. After entering this world, users can start new lives with their new identities.
10	Baidu	Metaverse is essentially a virtualization and digitization process of the real world, which requires a large amount of transformation of content production, economic system, user experience and physical world content.
11	CITIC Securities Company Limited	Metaverse breaches the limits of the 2D virtual world and provides users a 3D virtual world with a real, efficient and unified system.
12	Zhongguancun Big Data Industry Alliance	Metaverse is the application of comprehensive technology, the integration of multiple science and technologies. It is a cross industry application. It is not only a scientific and technological issue, but also an economic issue. It is the next era.

Key content based of Metaverse on ontology

Metaverse is a compound word—meta and universe. Literally, Metaverse is a universe beyond the real world. It was first brought in 1992, now with the integration of multiple technology developments, Metaverse could be the next revolutionary product.

Ontology of Metaverse

Integrated logical expression of digital consensus ecology

Conceptualization Key components	Explicit Key factor	Formal Engineerning	Share Standard consensus
Governance system Cooperative system Economy system Content system Technical system	Organization Identity Asset Activities	Space application Service System Network	Basic Tech & platform Data & protocol Content & asset Application & service Governing & regulation

Key componets

Ontology of Metaverse			
Conceptualization	Explicit	Formal	Share

Rule
Copyright protection, digital authentication, content regulation, financial regulation, science and technology ethics, basic rules of operation

Consensus
Real-time mult-party collaboration, DAO, expansion

Exchange
Unique identity, incentive mechanism, equity and ownership protection, transferability

Spreading
Openness, creativity, diversity, continuity, real-time, low latency, immersion.

Integration
Compatibility, open source, programmability, connectivity, scalability, mobility.

Key factors

Ontology of Metaverse

Conceptualization	Explicit	Formal	Share

Organization

Traditional internet company controls the data ,content and the market. Blockchain can built distributed organization just like DAO to deliver the value to the user.

Identity

Traditional identity management systems are all centralized, it will bring more security and privacy problems. Blockchain can support the DID system, and it will protect our identity and privacy.

Asset

The industry with assets(Bitcoin) circulation is a sustainable ecosystem, blockchain could provide the infrastructure for the economy ecosystem.

Activities

The activities in Metaverse could be abstracted to data. and flow and exchange of data need to be protected by blockchain technology.

Engineering Practice

Standard focus

Ontology of Metaverse			
Conceptualization	Explicit	Formal	Share

Company focus

International

Gaming+Content Creating+Economic System

Socializing+Content Creating+Economic System

Entertainment+Content Creating+Economic System

Unity

Game Engine+Content Creating

Meta

Oculus+Creator+Workplace

Microsoft

Hololens+Digital twin+Virtual Work space

Apple

NetVR+Metaverse Infrastracture

NVIDIA

Ominiverse+AI Avatar platform

China

Baidu 百度

Creator City
Gaming+Socializing+Content Creating

網易 NETEASE
www.163.com

Yaotai
Gaming+Socializing+Content Creating

Tencent 腾讯

Roblox、Tmiland

ByteDance 字节跳动

PICO:VR/AR LENS

Application Scenarios

- Gaming

Gaming is one of the most foremost entries among applications of Metaverse. Gaming in Metaverse provides users more immersive experience with the help of AR/VR technologies.

- Socializing

Socializing based on Metaverse is a social ecology based on real person avatars that can realize collective interaction. Users live in the virtual world as avatars, and all experiences revolve around the avatar.

- Finance

The operation of Metaverse is inseparable from financial applications. For example, similar to real life, in the virtual world, houses, products, clothing, land and avatars can be bought and sold just like in the real world.

- Interoperability

All industries need to achieve integrations with competition, Metaverse is no exception. Interoperability is actually the road and tool to achieve integration, or an alternative solution before the ultimate realizing ultimate Metaverse.

CONTENTS

1 Industry background

2 Standardization needs

3 Recommendations for a SEG

Standardization needs for the industry

Metaverse technologies have entered the market and it is in the stage of exploring applications. There will be more applications in the future, requiring the supports of standardization:

Step 1: Establish industrial consensus, unify concepts.

Step 2: Identify and standardize the basic bottom line requirements(algorithm kidnapping, technical discrimination
and other issues), and establish scientific and technological ethics governance methods

Step 3: With respect to existing standardization elements, it is necessary to coordinate all elements from a systematic
perspective, so as to coordinate the Metaverse ecology

Step 4: Standardize the development path and promote technology integration and Internet upgrading

Step 5: Application innovation

No international standard organizations involved

Various ways have been applied to some Metaverse related areas by some groups. However, standardization on the Metaverse hasn't been taken full consideration. With a new SEG, it may take over some relevant work. It is essential to establish a standardization evaluation group (SEG) on standardization for the Metaverse.

- Many technical fields are involved with the Metaverse. However, within ISO、 IEC、ITU-T, There currently isn't a SEG on the Metaverse. Nor there is any standardization project on the Metaverse subject.
- Currently in ISO, the relevant research about the Metaverse is handled by
- Blockchain (TC590)
- Artificial Intelligence (ISO/IEC JTC1 SC42)
- Internet of Things (ISO/IEC JTC1 SC41)
- Digital Twin (ISO/IEC JTC 1/SC 41/WG6)
- Cloud Computing (ISO/IEC JTC1 SC38).
- computer Graphics, image processing and Environmental data representation (ISO/IEC JTC1 SC24)
- Coding of Audio, Picture, Multimedia and Hypermedia Information(ISO/IEC JTC1 SC29)
- IEC 63145-20-10 specifies the standard measurement conditions and measurement methods for determining the optical properties of eyewear displays

Current Metaverse related standards

No.	Organization	AI	AR/VR/XR	Andriod	Blockchain	Big data	Brain Computer Interface	Cloud Compting	Computer Graphics	Cyber Security	Digital Human	Digital collaction/NFT	DID	Digital Twin	Iot	IP	Middleware	TCP
1	ITU	SG 13 Future Networks ITU-T Y.3116	SG12 Performance, QoS & QoE ITU-T G.1035	SG16 Multimedia & digital technologies ITU-T F.746.12	SG5 Environment, EMF & circular economy ITU-T L.1317	SG 13 Future Networks ITU-T Y.3606	–	SG 13 Future Networks ITU-T Y.3535	–	SG16 Multimedia & digital technologies	SG16 Multimedia & digital technologies ITU-T F.748.15	SG16 Multimedia & digital technologies H.DLT-DCS	SG17 Security ITU-T X.1403	SG17 Future Networks ITU-T Y.3090	SG20 IoT, smart cities & communities ITU-T Y.4102/Y.2074	SG9 Broadband cable & TV ITU-T J.482 (2021) COR. 1	–	–
2	IEC	TC 93 Design Automation (Work taken by TC 91 Electronics assembly technology) IEC 62243 Ed 2.0	TC 110 Electronics Dsiplays IEC 63145-20-10 ED1	–	–	–	–	–	–	TC 85 Measuring equipment for electrical and electromagnetic quantities 85/743/NP - PNW TS 85-743 ED1	–	–	–	–	TC 65 Industrial-process measurement, control and automation 65/794/CDV - IEC 62872-2 ED1	TC 79 Alarm and electronic security systems 79/419/DTS - IEC 60839-7-8 TS Ed.1	–	TC 57 Power systems management and associated information exchange IEC 62351-3 ED2
3	ISO	–	–	–	ISO/TC 307 Blockchain and distributed ledger technologies ISO 23257:2022	ISO/TC 69 Applications of statistical methods ISO/AWI TR 23348	–	–	–	–	ISO/TC 133 Clothing sizing systems - size designation, size measurement methods and digital fittings ISO 20947-1:2021	ISO/TC 68/SC 8 Reference data for financial services ISO 24165-2:2021	–	ISO/TC 184/SC 4 Industrial data ISO 23247-2:2021	–	–	–	–
4	JTC1	JTC1/SC 42 Artificial intelligence WG5	ISO/IEC AWI 9234	–	–	–	JTC 1 Information technology ISO/IEC AWI 8663 JTC1/SC 43 Brain computer interfaces	JTC 1/SC 38 Cloud computing and distributed platforms ISO/IEC 19086-2:2018	JTC 1/SC 24 Computer graphics, image processing and environmental data representation WG 6	JTC 1/SC 27 Information security, cybersecurity and privacy protection WG 2	–	–	–	JTC 1/SC 41 Internet of things and digital twin ISO/IEC AWI 30172	ISO/IEC JTC 1/SC 41 Internet of things and digital twin ISO/IEC 30162:2022	–	ISO/IEC JTC 1/SC 29 Coding of audio, picture, multimedia and hypermedia information ISO/IEC 23006-2:2016	–

Relevant international organizations

On June 21, 2022, the IEEE Computer Association approved the establishment of the IEEE Computer Society SAB SC Metaverse PAR Study Group (IEEE C / MSG). With Ming Li, CESI as the chair, Experts from more than 10 countries around the world participated in the standardization research.

On June 21, 2022, open standards organization in the US, Khronos group, along with tech giants including Meta, Microsoft, Epic Games, NVIDIA, Sony, Unity, Alibaba, Huawei and few others jointly established an organization called "Metaverse Standards Forum" to formulate Metaverse industry standards and build interoperability standards for cooperation, So that the Metaverses of various companies can be compatible with each other.

On July 22, 2022, Animoca Brands、Dapper Labs、The Sandbox and several Metaverse、Web 3 Platforms cofounded Open Metaverse Alliance for Web3 (OMA3) to bring up standards to promote the collaboration of Web 3 and other industries.

Affected by standardizations

Governance and Supervision

- No standards in the Metaverse technological ethical governance
- Subject responsibility of AIGC、Digital behavior

Contents and Assets

- No standards in the digital contents (Digital human) and assets (props, etc): code and marks, construction, storage, performance, combinations, circulation, disposition

Technology

- No standards in between Metaverses and Metaverses applications: cross platform identity authentication, contents interaction, assets circulations.
- There are standards in some singular technologies, but there are no standards supports in the multiple technologies integration.
- Multi body credible authentication

Service

- System tests: functions, capability, reliability
- Service ability comments: Enterprise、personnel、technology

Basic

- Lack of Metaverse terminology、definitions、subject and classifications standards、data classifications and format standards.

CONTENTS

1 Industry background

2 Standardization needs

3 Recommendations for a SEG

Recommendations for a SEG：Scope

- Define a common understanding of Metaverse， identify boundaries, elements and corresponding standardization organizations.
- Investigate needs for standardization in the area of Metaverse technologies. Investigate current research and technology activities.
- Evaluate technical capabilities and applications in this field.
- Propose a roadmap for standardization in the area of Metaverse
- Engage with TC/SC/SyCs, including JTC 1， ITU, as well as with ISO and other market and policy relevant organizations.

Standards are the fundamentals of discovering the world basic patterns to speed up social progress!