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ITU Focus Group on metaverse

Guidance on how to build a metaverse for all – Part I: Legal framework

Working Group 8: Sustainability, Accessibility & Inclusion

Technical Report ITU FGMV-18

Guidance on how to build a metaverse for all: Part I – Legal framework

Summary

This Technical Report ITU FGMV-18 proposes some guidelines to ensure by default equity, accessibility, and inclusivity in the development of the metaverse. Its primary objective is to offer the context for the legal framework based on the United Nations (UN) mandates and the sustainable development goals (SDGs), along with the derived standards. This Report offers a comprehensive understanding of the current state of the background which should underlay any metaverse development. The document also identifies the key challenges that hinder the achievement of equity, accessibility, and inclusivity within the metaverse, and proposes potential roadmaps towards constructing a metaverse leaving no one behind.

Keywords

Accessibility, diversity, equity, human rights, inclusivity, metaverse.

Note

This is an informative ITU-T publication. Mandatory provisions, such as those found in ITU-T Recommendations, are outside the scope of this publication. This publication should only be referenced bibliographically in ITU-T Recommendations.

Change Log

This document contains Version 1.0 of the ITU Technical Report on "*Guidance on how to build a metaverse for all: Part I – Legal Framework*" approved at the 4th meeting of the ITU Focus Group on metaverse (FG-MV), held on 4-7 December 2023 in Geneva, Switzerland.

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Additional information and materials relating to this report can be found at: https://www.itu.int/go/fgmv. If you would like to provide any additional information, please contact Cristina Bueti at tsbfgmv@itu.int.

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Table of Contents

Technical Report ITU FGMV-18

Guidance on how to build a metaverse for all: Part I – Legal framework

1 Scope

This Technical Report provides information regarding the United Nations (UN) requirements to develop an accessible metaverse for all people. The legal context provided in this Report will benefit professionals working on metaverse development, from policymakers, regulators, industry, academia, manufacturers, content producers and designers. This TR is also important for town planners in the CitiVerse.

NOTE – This Technical Report lays the foundation for the "Guidance on how to build a metaverse for all: Part II – Survey results."

2 References

None.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Technical Report

None.

4 Abbreviations and acronyms

This Technical Report uses the following abbreviations and acronyms:

ATAG	Authoring Tool Accessibility Guidelines
AVMSD	Audiovisual Media Service Directive
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CMS	Content Management System
CRPD	Convention on the Rights of Persons with Disabilities
CVAA	Twenty-First Century Communications and Video Accessibility Act
ETSI	European Telecommunication Standardisation Institute
EU	European Union
ICT	Information and Communications Technology
LDC	Least developed countries
MDG	Millennium Development Goals
NGO	Non-governmental Organisation
SDG	Sustainable Development Goals
SIDS	Small Island Developing States

UAAG	User Agent Accessibility Guidelines
UN	United Nations
USA	United States of America
W3C	World Wide Web Consortium
WAI	Web Accessibility Initiative
WCAG	Web Content Accessibility Guidelines

5 Conventions

None.

6 Introduction

Building a metaverse for all people will be a challenging task. Making sure the metaverse can be accessed from everywhere in any language modality for diverse human profiles is worth pursuing. The metaverse has the potential to transform the way we live, work, and connect with each other. All people should have the opportunity to be part of the metaverse and benefit from it. Three main issues should be taken into consideration: accessibility, inclusivity and openness. Accessibility secures human interaction and communication regardless of capabilities or disabilities, income, location, or technical expertise. Inclusivity looks at making sure the metaverse is a welcoming ecosystem, it is welcoming for everyone, taking care of diversity and creating a culture of respect and tolerance. Finally, also openness and interoperable, so that people can interact freely and easily. For these too, a set of standards and protocols will need to be developed.

7 Framework

This Technical Report provides the background on why to develop accessible products and services in the metaverse for all people regardless of their language, age or disability. The metaverse combines virtual reality, augmented reality, mixed reality, virtual reality and other artificial intelligence (AI) and blockchain technologies, allowing all people to perform a wide variety of tasks such as interact, work, socialize, entertain or transact in the virtual world.

8 Disability considerations at the UN

According to the 2011 world report on disability by the World Health Organization / World Bank [b-WHO], there are an estimated 1 billion persons with disabilities worldwide. The same report states that 1 in 5 of the world's poorest people have disabilities. Disability is both a cause and consequence of poverty, yet international policymakers and stakeholders have not historically recognized or prioritized this issue within international development efforts.

The Secretariat for the convention on the rights of persons with disabilities (CRPD) is the focal point within the United Nations system on matters relating to disability [b-UN 1]. It is housed in the division for social policy and development which is responsible for activities related to social policy and development, poverty eradication and employment, generational issues and integration, inclusive development, non-governmental organization (NGO) issues, and indigenous issues. The division is part of the department of economic and social affairs of the United Nations Secretariat in New York. The Secretariat prepares publications and acts as a clearinghouse for information on disability issues; promotes national, regional and international programmes and activities; provides support to governments and non-governmental organizations; and gives substantial support to technical co-operation projects and activities.

The major objectives of the Secretariat for the convention on the rights of persons with disabilities are the following: (i) to support the full and effective participation of persons with disabilities in social life and development; (ii) to advance the rights and protect the dignity of persons with disabilities and; (iii) to promote equal access to employment, education, information, goods and services.

Their webpage *Enable* [b-UN DESA] describes how persons with disabilities often are excluded from the mainstream of society and denied their human rights. Discrimination against persons with disabilities takes various forms, ranging from invidious discrimination, such as the denial of educational opportunities, to more subtle forms of discrimination such as segregation and isolation because of the imposition of physical and social barriers. Effects of disability-based discrimination have been particularly severe in fields such as education, employment, housing, transport, cultural life and access to public places and services. This may result from distinction, exclusion, restriction or preference, or denial of reasonable accommodation on the basis of disablement, which effectively nullifies or impairs the recognition, enjoyment or exercise of the rights of persons with disabilities.

Despite some progress in terms of legislation over the past decade, such violations of the human rights of persons with disabilities have not been systematically addressed in society. Most disability legislation and policies are based on the assumption that persons with disabilities simply are not able to exercise the same rights as non-disabled persons. Consequently, the situation of persons with disabilities often will be addressed in terms of rehabilitation and social services. A need exists for more comprehensive legislation to ensure the rights of disabled persons in all aspects – political, civil, economic, social and cultural rights – on an equal basis with persons without disabilities. Appropriate measures are required to address existing discrimination and to thereby promote opportunities for persons with disabilities to participate on the basis of equality in social life and development.

There also are certain cultural and social barriers that have served to deter the full participation of persons with disabilities. Discriminatory practices against persons with disabilities thus may be the result of social and cultural norms that have been institutionalized by law. Changes in the perception and concepts of disability will involve both changes in values and increased understanding at all levels of society, and a focus on those social and cultural norms that can perpetuate erroneous and inappropriate myths about disability. One of the dominant features of legal thinking in the twentieth century is the recognition of law as a tool of social change. Though legislation is not the only means of social progress, it represents one of the most powerful vehicles of change, progress and development in society.

Legislation at the country level is fundamental in promoting the rights of persons with disabilities. While the importance – and increasing role – of the international law in promoting the rights of persons with disabilities is recognized by the international community, domestic legislation remains one of the most effective means of facilitating social change and improving the status of disabled persons. International norms concerning disability are useful for setting common standards for disability legislation. Those standards also need to be appropriately reflected in policies and programmes that reach persons with disabilities and can effect positive changes in their lives.

9 UN conventions regarding accessibility, inclusiveness and diversity

In 2006 the United Nations convention on the rights of persons with disabilities (CRPD) came into force. The CRPD is one of the nine core international human rights treaties and it includes 33 articles covering all the areas of life. By 2016, 161 out of 193 United Nations Member States had ratified the CRPD, this is over 80% of countries [b-UN OHCHR]. Once a country ratifies, it is legally bound to implement the core 33 articles and must report on its progress in writing to the United Nations periodically. CRPD recognizes the importance of access to communication in Article 9 where it states:

> To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to

information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.

Two examples of legislation [b-DREDF] related to IT development and disabilities are the United States of America (USA) and the European Union (EU). In the US, the twenty-first century communications and video accessibility act (CVAA) was signed by President Barack Obama on October 8, 2010. The CVAA makes sure that accessibility laws enacted in the 1980s and 1990s are brought up to date with 21st century technologies, including new digital, broadband, and mobile innovations. Another example is in the European Union (EU), comprised of 27 Member States. The EU is not a country but rather an alliance of nations. Each individual EU country maintains its own relationship with the UN as an independent party. For issues of media accessibility, the EU collectively engages as a party, thereby influencing all 27 Member States.

Three pieces of legislation have been the result of the CRPD adoption in the EU. The three pieces have taken the form of a directive, which is legally binding, meaning that the EU member states have an obligation to apply the content of the act. In chronological order the first is the audiovisual media service directive (AVMSD) Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions of audiovisual media services. This directive created an EU-wide legal framework to coordinate national legislation on all audiovisual media, both traditional TV broadcasting and on-demand services platforms working in the EU, such as Netflix, Amazon Prime Video, Apple and HBO. The directive covers different aspects of audiovisual media, such as the prohibition of hate speech and discrimination based on disability and other grounds, commercial information on TV programmes, protection of minors, independence of the national regulatory bodies that monitor audiovisual services, and the promotion of European audiovisual productions. The directive established legal requirements to advance accessibility of audiovisual media for persons with disabilities. In 2018, the EU updated AVMSD with stronger requirements for accessibility. In light of the evolving market realities, the Directive (EU) 2018/1808 of the European Parliament and of the Council, dated 14 November 2018, modifies Directive 2010/13/EU [b-EU AVMSD]. This directive pertains to the coordination of certain provisions established by law, regulation, or administrative action in Member States concerning the provision of audiovisual media services (audiovisual media services directive), commonly known as the audiovisual media services directive.

The second directive is the web accessibility directive (EU) 2016/2102 of the European Parliament and the Council of 26 October 2016 [b-EU WAD]. This directive covers the accessibility of the websites and mobile applications of public sector bodies. It forces public sector bodies such as municipalities, schools, health services, and transport information, to make their websites and mobile applications accessible to people with disabilities. The Directive requires websites and applications (APPS) of public sector institutions to meet specific technical requirements set out in web accessibility standards, such as W3C, and it also mentions a limited number of exceptions for example, the accessibility of the interaction with media player, and the media player itself. The directive requires:

– An accessibility statement for each website and mobile application;
– A feedback mechanism so that users can flag accessibility problems or request access to inaccessible content;
– Regular monitoring and reporting of results of public sector websites and applications by Member States.

The third piece of EU legislation is the Directive (EU) 2019/882 of the European Parliament of the Council of 17 April 2019 that concerns the accessibility requirements of products and services European accessibility act [b-EU EAA]. This law seeks to make products and services in the EU more accessible for people with disabilities. Some examples include smartphones, tablets, computers, TV and its content, e-books, online shopping websites, self-service terminals, delivery of transport

service information, including real-time travel information, consumer banking services, etc. There is a marked difference in this directive from the previous two accessibility directives, namely, the extension to both public and private sector organizations, who are required to monitor the accessibility of their respective websites, mobile applications and media content. In addition to this requirement, organizations are required to provide an accessibility statement to a central authority in their respective countries.

Almost all countries in the world have signed and ratified the CRPD leading to several national actions, i.e., to draft legislation to support CRPD, to develop standards to provide requirements, specifications, guidelines to fulfil the national legislation, and finally to report to the United Nations.

10 Standardization

A national law leads to standardization, towards consistent application of products or processes. Standards provide 1) a common language to measure and evaluate performance, 2) make interoperability of components made by different companies possible, and 3) protect consumers by ensuring safety, durability, and market equity.

Standards need standards-making bodies. ITU's Telecommunication Standardization Sector (ITU-T) plays a crucial role in defining the core transport and access technologies that underpin communications networks around the world. Today's advanced wireless, broadband and multimedia technologies are all powered by ITU Recommendations. The principles underlying the ITU-T standardization process ensure that all voices are heard and that efforts to develop standards do not favour particular commercial interests, and the resulting standards have the consensus-derived support of the diverse set of stakeholders that comprise the ITU membership.

ITU-T's successes in standardization are significant feats of international collaboration. These standards are developed by representatives of ITU's membership of 193 Member States, over 700 private-sector entities, and over 150 academic and research institutes.

The inclusivity of the ITU-T standardization platform – supported by the ITU bridging the standardization gap programme – assists in offering all the world's countries equal opportunity to benefit from the information and communications technology (ICT) advances changing our world.

It is important that the accessibility standards produced by the various groups working worldwide are harmonized, i.e., they do not contradict each other. To that end standards developed by ITU are participated by most countries hence identifying potential areas of conflict and action steps to resolve conflicts.

Without harmonization, conflicting standards force vendors to produce the same product in more than one configuration, each configuration conforming to a different standard resulting in manufacturing inefficiencies and a slower rate of growth for EIT/ICT technology in general.

Section 508 in the USA [b-SECTION 508]. The law enacting Section 508 (29 U.S.C. 794d) directed the access board to develop a standard for the accessibility of ICT. This standard is the only standard in the US that federal agencies must follow when they develop, procure, maintain, or use electronic and information technology. However, there are several government-supported efforts around the world working on a "standards approach" to ensuring the accessibility of ICT for people with disabilities. In Europe standard - EN 301 549 V3.2.1 (2021), "Accessibility requirements for ICT products and services". Standard EN 301 549 was produced in 2014 by the three European standardization organizations, European committee for standardization (CEN), European committee for electrotechnical standardization (CENELEC) and European Telecommunication Standardisation Institute (ETSI) in response to a request from the European Commission (mandate 376) and it is under revision.

The World Wide Web Consortium (W3C) references specific standards in policy documents to ensure clear criteria for accessibility. The W3C web accessibility initiative (WAI) provides a set of

accessibility standards that are commonly recognized by governments and organizations from around the world. These include:

– **Web content accessibility guidelines (WCAG)** applies to all web content and applications. This includes content on mobile, television, and other delivery channels. The WCAG overview [b-W3C WCAG] provides more background.

– **Authoring tool accessibility guidelines (ATAG)** applies to websites that provide users the opportunity to generate content. For example, adding comments, posting to forums, or uploading images or videos. ATAG is also relevant if your organization provides tools such as content management systems (CMS), for staff or customers to manage websites and content. The ATAG overview [b-W3C ATAG] provides more background.

– **User agent accessibility guidelines (UAAG)** applies when additional plugins are provided to deliver additional content. Media players are a good example of this. UAAG also applies when custom controls are used to provide a non-standard functionality. UAAG may also be relevant where mobile applications deliver web content as part of the application. It may also be relevant to the procurement process if your organization provides browsers for staff. The UAAG overview [b-W3C UAAG] provides more background.

This Technical Report is part of the ITU Focus Group on metaverse since the industry has not converged towards common terms and definitions. The ITU Focus Group on metaverse was established under TSAG on 16 December 2022. The group is analysing 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.

11 UN Sustainable Development Goals leaving no one behind in the metaverse

During the 2012 United Nations conference on sustainable development 20 Member States agreed to launch a process to develop a set of sustainable development goals (SDGs) to succeed the millennium development goals (MDGs), whose achievement period concluded in 2015. In 2014 the UN published the road to dignity [b-UN 2] by ending poverty, transforming all lives and protecting the planet where the SDG was drafted. The SDGs are to address all three dimensions of sustainable development (environmental, economic, and social) and be coherent with and integrated into the United Nations global development agenda beyond 2015. The envisaged SDGs have a time horizon of 2015 to 2030.

In September 2015 after three years of intense intergovernmental negotiations United Nations Member States adopted the 2030 agenda for sustainable development. The 2030 agenda has 17 goals for sustainable development and 169 targets. There are 11 explicit references to persons with disabilities in the 2030 agenda, and disaggregation of data by disability is a core principle.

The 2030 agenda and the sustainable development goals (SDGs) will influence the direction of global and national policies relating to sustainable development for the next 15 years. If the 2030 agenda is going to be successful, all of the UN Member States – 193 countries – must include persons with disabilities in their national plans for implementation and monitoring.

While the infographic aims to illustrate how the 17 goals of the SDGs and the 33 articles of the CRPD are linked to each other, it is important to stress that both the SDGs and the CRPD must be implemented as a whole. This means that countries should not 'cherry pick' single goals or articles, as all of them form part of a complex and interconnected equation.

The text of the 2030 agenda and the sustainable development goals (SDGs) can be interpreted through the lens of the UN convention on the rights of persons with disabilities (CRPD) in the following ways [b-UN SDG]:

– All references to 'equal' must be underpinned by CRPD article 5, which promotes equality of opportunity and non-discrimination of persons with disabilities.

– References 'for all' include all persons with disabilities – people with different types of impairments and support requirements; women with disabilities (CRPD article 6) and children with disabilities (CRPD article 7).
– All references to 'access' or 'inclusion' can be fulfilled by article 9 of the CRPD on accessibility which requires governments to take action to ensure persons with disabilities the right to independent living and participation in all aspects of life.
– All references to 'those in vulnerable situations' include the right of protection and safety of persons with disabilities in situations of risk, natural disasters and humanitarian emergencies (CRPD article 11).
– All progress made by the SDGs must be monitored through disability disaggregated data (CRPD article 31).
– All references to 'development and/or least developed countries' (LDC) relate to international cooperation and partnerships (CRPD article 32).

Vulnerable groups, especially people with disabilities, are referenced in various parts of the SDGs and specifically in parts related to education, growth and employment, inequality, accessibility of human settlements, as well as data collection and monitoring of the SDGs, for instance:

Goal 4 on inclusive and equitable quality education and promotion of life-long learning opportunities for all focuses on eliminating gender disparities in education and ensuring equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities. In addition, the proposal calls for building and upgrading education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

Goal 8 to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all, the international community aims to achieve full and productive employment and decent work for all women and men, including for persons with disabilities, and equal pay for work of equal value.

Closely linked is **Goal 10**, which strives to reduce inequality within and among countries by empowering and promoting social, economic and political inclusion of all, including persons with disabilities.

Goal 11 would work to make cities and human settlements inclusive, safe and sustainable. To realize this goal, Member States are called upon to provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations such as persons with disabilities. In addition, the proposal calls for providing universal access to safe, inclusive and accessible, green and public spaces, particularly for persons with disabilities.

Goal 17 stresses that in order to strengthen the means of implementation and revitalize the global partnership for sustainable development, the collection of data and monitoring and accountability of the SDGs are crucial. Member States are called upon to enhance capacity-building support to developing countries, including least developed countries (LDCs) and small island developing states (SIDS), which would significantly increase the availability of high-quality, timely and reliable data that is also disaggregated by disability.

12 Models of disability and universal design

UN DESA webpage *Enable* [b-UN DESA] puts forward some models for disability and definitions. Disability is an elusive term that has political, social, and personal issues attached to its definition. There are many models of disability, and no consensus can be reached. For this reason, the metaverse should not focus on any model of disability and should avoid as much as possible assistive technologies aiming towards universal design.

Universal design is the guiding principle towards a fully accessible environment, so it can be accessed, understood, and used to the greatest extent possible by all people regardless of their age, culture, education, capability or disability. The environment can be physical or digital like the metaverse and it may contain products, or services such as those described in the FG-MV Technical Specification on "Requirements of accessible products and services in the metaverse: Part II – User perspective" [b-FGMV-05].

The metaverse must be accessible by default. It should be designed to meet the needs of all people who wish to use it. This is a human right and a fundamental condition of good design. Taking into consideration human, cultural, and social requirements, the diverse needs and abilities of all people throughout the design process will lead to a metaverse for all thus avoiding digital exclusion.

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