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Near-term and long-term implications for people in the metaverse

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Near-term and long-term implications for people in the metaverse

Summary

Given that the industry has not yet converged on a precise understanding of what is commonly referred to as the "metaverse", there is general confusion between definitions of this term based on Facebook's transformation to Meta in 2021 and definitions that evolved from the concept that was popularized by Neal Stephenson's novel, *Snow Crash*, in 1992. This has led to conflicting declarations of the metaverse as being both in its nascent phase and already dead.

Nevertheless, as the world becomes increasingly digital, the metaverse (no matter the definition ascribed to it) is emerging as a new frontier of social and economic interaction; allowing people to create, connect, and collaborate in ways that were previously thought impossible.

The promise of a post-COVID-19 metaverse is rapid acceleration of an already super-charged global digital transformation with the potential to transform our lives, livelihoods, and interactions, in the near-term and long-term, in ways that cannot be overstated. Neither can our lack of clarity around the implications.

This Technical Report explores the near-term and long-term implications for people in the metaverse as a framework for understanding potential impacts and a guide for maximizing the benefits and minimizing associated risks.

Keywords

metaverse; internet; web 1.0; web 2.0; web 3.0; decentralized system; public sector; private sector; third sector; digital transformation; immersive; digital sphere; physical sphere; blended reality; multiverse

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 "*Near-term and long-term implications for people in the metaverse*" approved at the 5th meeting of the ITU Focus Group on metaverse (FG-MV), held on 5-8 March in Queretaro, Mexico.

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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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Near-term and long-term implications for people in the metaverse

1 Scope

To explore the near-term and long-term implications for people in the metaverse, this Technical Report investigates the metaverse from the perspective of its potential as the future of the Internet through historical and present-day observations.

The scope of the report is to:

1. Present a journey into the metaverse as part of the history of the Internet.
2. Collect present day perspectives and experiences as they relate to metaverse implications.
3. Present these insights and analysis as a framework for understanding potential near-term and long-term implications, and a broad guide for maximizing the benefits of the metaverse and minimizing its associated risks.

2 References

None.

3 Terms and definitions

3.1 Terms defined elsewhere

This Technical Report uses the following terms defined elsewhere:

3.1.1 Decentralized system [**b-ITU-T X.1400**]: Distributed system wherein control is distributed among the persons or organizations participating in the operation of system.

3.1.2 metaverse [b-ITU FGMV-20]: 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.

3.1.3 Web 3.0 [b-ISO 5127:2017]: Following Web 2.0 which rather than simply connecting internet addresses and data in their formal form additionally does effect data linking through and in favour of their semantic content or meaning thus providing enriched and enlarged information answering requests.

3.2 Terms defined here

This Technical Report defines the following terms:

None.

4 Abbreviations

3D	Three-Dimensional
AI	Artificial Intelligence
NFT	Non-Fungible Token
AR	Augmented Reality
VR	Virtual Reality

5 Human digital migration

5.1 Background

The process of people "migrating" into the metaverse is likely to be complex and multifaceted, bringing with it positive and negative impacts. As people spend more time in these environments, their immersive nature may have implications that span widely from new opportunities to interact, connect, experience, learn and work; to challenges related to security, discrimination, addiction, misconduct, and abuse.

This process, now in its nascent phase, is being shaped by the infrastructure and technologies that underpin the Internet as we know it, baking in all the unintended consequences of Web 2.0. Given that reality, it is important to carefully consider potential implications and leverage lessons learned from the approximately 34-year history of the Internet, including how it dovetails into the "interactive era" and now into the metaverse.

5.2 A brief history of the Internet

The first iteration of the Internet, often referred to as Web 1.0, started as read only, a one-way interaction consisting of consumption by the user (an example is static websites). The following version, which is often referred to as Web 2.0, evolved into read and write by creating a two-way engagement, where users can consume and create (one example is social media).

Web 3.0, the computing era that follows the mobile-powered Web 2.0 is often identified with the "Semantic Web", which centres on the capability of machines to read and interact with content in a manner more akin to humans. Recently, definitions of Web 3.0 have begun to include distributed ledger technologies such as blockchain, focusing on their ability to authenticate and decentralize information. Theoretically, this could remove the power of platform owners over individual users [b-Deloitte].
As these terms are generally used for that purpose, this report notes Web 1.0, Web 2.0, and Web 3.0 in its presentation of the history of the Internet.

To ensure a shared understanding (and for the purpose of this report), the report proposes that the current and evolving iteration of the Internet that follows Web 2.0 can be generally understood as an *Internet and computing era differentiated by on-demand user customization, multi-layered engagement, and a resurgence of decentralized systems* where:

- On-demand user customization is made possible by intelligent software that can read and interact with content.
- Multi-layered engagement can include multisensory activity in the metaverse where metaverse is defined as 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 [b-ITU FGMV-20].
- Decentralized systems are those that distribute control amongst participating persons or organizations [b-ITU-T X.1400]; often using peer-to-peer digital tools like blockchain technology, to give users more control, autonomy, and the possibility of ownership.
- Resurgence in relation to decentralized systems considers that the early Internet was also decentralized.

The Internet's history starts in about 1962, but it was not until 1983 that the "modern" Internet was born with ARPANET's (The Advanced Research Projects Agency Network) transformation into Robert Kahn and Vinton Cerf's Transmission Control Protocol and Internet Protocol, or TCP/IP.

The subsequent subsections present a joint human journey into the metaverse as part of the history of the Internet (Web 1.0, Web 2.0, and Web 3.0) through various iterations, including milestones

relating to the Internet's transition from passive viewing of often static content to the interoperability and collaborative consumption that has given rise to today's participatory culture; starting with Table 1 below as follows:

1. Internet milestones and history from 1962 to 2021 (Table 1).
2. Milestones of the "interactive era" (through the history of the gaming industry) from 1972 to today (Figure 1).
3. History and milestones of the metaverse from 1838 to today (Figure 2 and Table 2).

Table 1: Internet milestones and history

Date	Milestone
1962	MIT's Licklider and Clark's "On-line man-computer communication" introduces "Galactic Network", a vision of social interactions enabled by globally interconnected computers that later become Wide Area Network (WAN).
1965	MIT's Roberts working with Merrill connect two computers on opposite sides of the United States with a low-speed dial-up telephone line creating the first WAN ever built.
1969	ARPANET, the first version of the Internet is created.
1972	BBN's Ray Tomlinson invents email at ARPANET.
1973	Global networking becomes a reality at ARPANET and the term "internet" is born (short for "internetworking").
1983	**The "modern" Internet is born** when ARPANET adopts Robert Kahn and Vinton Cerf's Transmission Control Protocol and Internet Protocol, or TCP/IP. Desktop workstations arrive.
1984	Gibson, author of *Neuromancer*, is the first to use the term "cyberspace".
Consumption ~1989 to 2004	
1989	CERN's Tim Berners-Lee invents the World Wide Web (WWW). AOL launches Instant Messenger chat service, welcoming users with the iconic, "You've got mail!". The Web opens to the public in 1991.
1993	CERN places World Wide Web technology in the public domain, donating it to the world; it enters general use.
1997	Wi-Fi is invented.
1998	Open source comes of age. Google search engine is born, changing the way users engage with the Internet.
1999	Peer-to-peer file sharing becomes a reality with Napster arrival. First large-scale cyberwar takes place.
2000	The dot-com bubble bursts.
2002	Weblogs (blogs) become popular. First social networking site launches.
2003	The SQL Slammer worm spreads worldwide in just 10 minutes. Wu coins the term Net Neutrality.
Collaborative ~2004 and ongoing	
2004	Facebook goes online and **the era of social networking begins**.
2009	Bitcoins, the first cryptocurrency created, starts being minted. Crowdfunding becomes popular.
2015	Out of 100 billion monthly Google searches, those from mobile devices surpass desktops for the first time. One billion users (1 in 7 people on Earth) access Facebook on a single day. Instagram reaches 400 million users; Twitter reaches 316 million.
2017	Facebook reaches 2 billion active monthly users, YouTube 1.5 billion, WhatsApp 1.2 billion, WeChat 889 million, Instagram 700 million, and Twitter 330 million. Facebook and other social

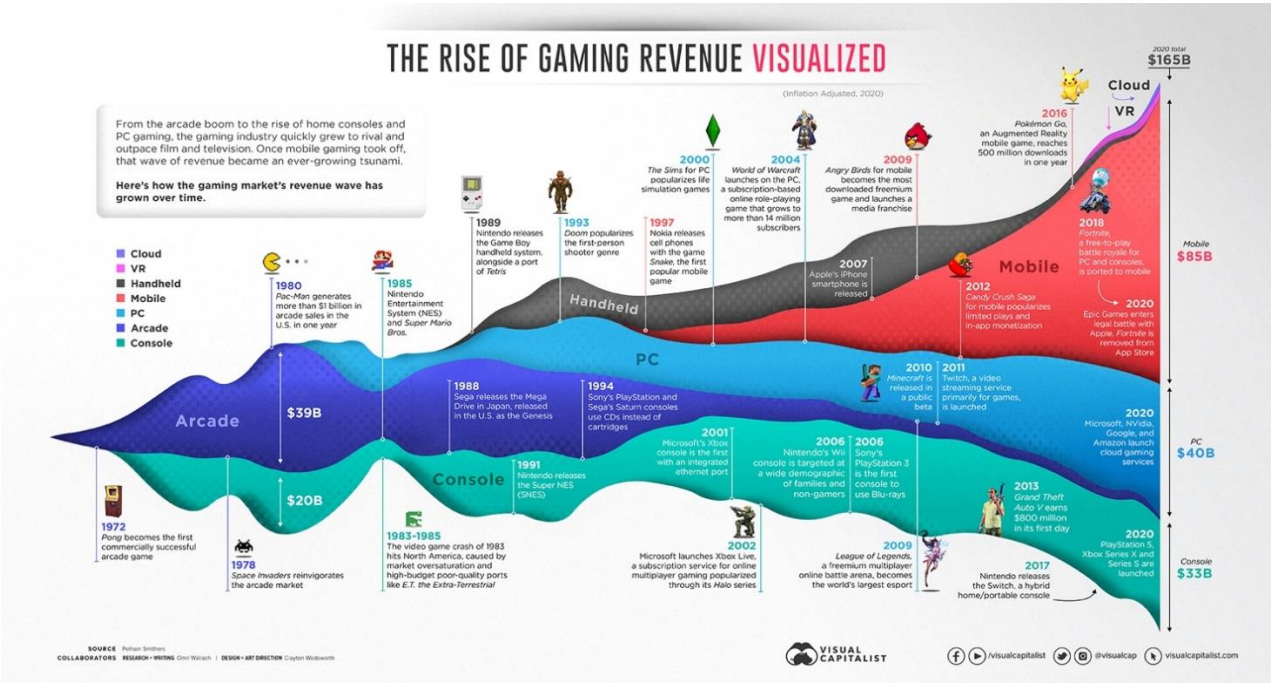
Date	Milestone
	media services are found to have been used by foreign governments to influence elections in the U.S. and in other countries.
2018	Significant rise in internet-enabled devices. Internet of Things (IoT) sees around 7 billion devices.
2021	4.66 billion people connected to the Internet; more than half of the global population.
	…

Source: Developed for this report primarily with [b-Hobbes] [b-Leiner-Cerf]

5.3 A brief history of the "interactive era"

Figure 1 provides a brief history of the gaming industry to illustrate the milestones of the "interactive era".

Figure 1: History of the gaming industry

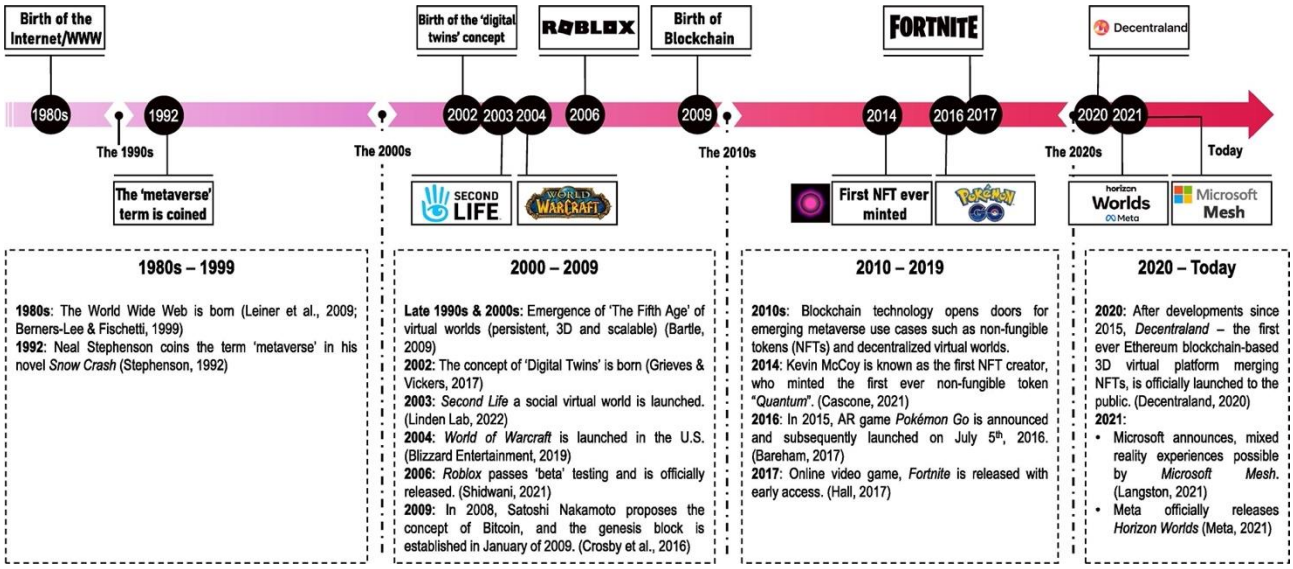


[b-WEF]

5.4 A brief history of the metaverse

Figure 2 provides a brief history illustrating the milestones of the metaverse.

Figure 2: History of the metaverse



[b-Barrera-Shah]

Table 2 summarizes milestones in the development of the metaverse starting with an earlier history (than Figure 2) of the concept and related technological advances. Table 2 also contextualizes the metaverse by adding Web 3.0 to visualize it as part of the Internet's evolutionary journey.

Table 2: Milestones in the development of the metaverse

Date	Milestone
1838	Scientist Sir Charles Wheatstone outlined the concept of "binocular vision," to make a single 3D image. This concept leads to the development of stereoscopes, the same concept used today in modern VR headsets.
1935	Science fiction writer Stanley Weinbaum publishes the book *Pygmalion's Spectacles*, in which the main character explores a fictional world using a pair of goggles that provided sight, sound, taste, smell and touch.
1956	Morton Heilig creates the first VR machine, the Sensorama Machine (3D video, audio, smell, and a vibrating chair).
1960	Heilig patents the first head-mounted display (combines stereoscopic 3D images with stereo sound).
1981	Science fiction writer Vernor Vinge's "Other Plane" introduces full-immersion virtual reality in the novella *True Names*.
1992	Science fiction writer Neal Stephenson coins the term "metaverse" to describe a 3D virtual space in the novel *Snow Crash*.
2002	The concept of digital twins is first introduced to improve design, operation, and maintenance of complex systems.
2003	Linden Lab launches Second Life, an online virtual world where users can create their own avatars and interact with each other.
2006	Online game platform Roblox launches, allowing players to customize avatars, buy and sell virtual items, and interact with each other.
2009	Blockchain technology is first introduced as the underlying technology for the cryptocurrency Bitcoin.
2010	Palmer Luckey creates prototype for Oculus Rift VR headset. The revolutionary headset reignites interest in VR.

Date	Milestone
2011	Science fiction writer Ernest Cline releases the novel *Ready Player One*. It becomes a runaway hit, and director Steven Spielberg makes it into a movie in 2018; further popularizing the concept of the metaverse.
Customized and Decentralized ~2014 to ongoing	
2015	Decentraland, a virtual world platform built on blockchain technology, is launched.
2020	The COVID-19 pandemic accelerates an already rapid global digital transformation including the further adoption of virtual events and remote work, leading to increased investment in the metaverse.
	NVIDIA launches Omniverse, a platform for industrial metaverse applications.
2021	Major technology companies announce plans to invest in and develop metaverse technologies, including a Facebook rebrand to Meta and Microsoft's launch of Mesh as a metaverse platform service.
2022	The United Nations' ICT agency, ITU, establishes the first Focus Group on metaverse.
	NVIDIA collaborates with Siemens to enable the industrial metaverse.
	…

Source: Developed for this report primarily with [b-Marr] [b-ITU FGMV-01]

6 Current state: Observing implications through pre-standardization

6.1 Context and Genesis

Given the considerable public attention it attracted, ITU-T's Telecommunication Standardization Advisory Group (TSAG) established an expert focus group to work towards international technical standards for the metaverse in December 2022.

Focus groups at ITU provide an effective forum for members and non-members to address urgent, market-oriented industry issues that lie outside the mandate of existing study groups; making this an appropriate format to address the new and ever-changing metaverse landscape.

The genesis of this document in that context is to contribute to the understanding of current and possible future implications for people in the metaverse as a guiding document to support metaverse standardization efforts.

6.2 A pre-standardization perspective: ITU's Focus Group on metaverse

The expert focus group established by TSAG, ITU's Focus Group on metaverse (FG-MV), brings together experts from around the world to shape the development of metaverse technology standardization for the benefit of all.

Through its terms of reference (TOR), the group is expected to develop a roadmap for setting technical standards to make metaverse services and applications interoperable, enable a high-quality user experience, ensure security, and protect personal data.

6.2.1 An SDO perspective of metaverse implications

As a precursor of future standardization work relating to the metaverse, it is important that FG-MV addresses implications of the metaverse as part of its pre-standardization efforts; including benefits and associated risks from the perspective of FG-MV focus areas as represented by the nine working groups (WGs) it has established to do its work.

Table 3 presents considerations on the topic of implications based on FG-MV WG TORs as follows:

- *FG-MV Topic Areas*: Proposes aligned implications that have been developed by this report as areas that could be addressed by each WG as they relate to the WG's TOR.

- *Illustrative*: Considerations that have been developed for utilization by this report (through desk research), to provide a baseline for future standardization activities. The baseline provided by these illustrations will also serve as a benchmarking exercise to compare implications that were revealed on the subject area through research to those that were addressed in Deliverables approved by this pre-standardization body.
- *From WG Deliverables*: In cases where FG-MV WGs and their Task Groups (TGs) address metaverse implications in Deliverables (approved through December 2023); their perspectives have been included in the "considerations" column with a comparative analysis of their alignment with perspectives gained from research.
- In cases where the FG-MV WG/TG does not address the topic of implications, only the illustrative considerations are included in the "considerations" column of the table.

Table 3: Metaverse implications: An illustration of SDO perspectives through FG-MV

WG	FG-MV Topic Area	Considerations
WG1 General	WG1 can address implications in the metaverse from a broad perspective that allows it to empower a holistic, data-based, and diverse view and to develop a roadmap for setting technical standards.	**Illustrative** COVID-19 accelerated an already rapid global digital transformation resulting in more and more lives lived online as important aspects of daily life (including education, work, and citizen engagement) migrate onto increased digital presence and online infrastructures. With the metaverse in its nascent phase, now is the time to develop an understanding of the concept and implications. **From WG1 Deliverables** <u>TG on implications for people in the metaverse</u> The Technical Report on "*Near-term and long-term implications for people in the metaverse*", this report, represents a general approach by the FG-MV to explore the near-term and long-term implications for people in the metaverse as a framework for understanding potential impacts and a guide for maximizing the benefits and minimizing associated risks. It investigates the metaverse from the perspective of its potential as the future of the Internet through historical and present-day observations as follows: • Historical: Leveraging lessons learned from the approximately 34-year history of the Internet, including how it dovetails into the "interactive era" and now into the metaverse. • Present-day (standards): Observing implications through pre-standardization, as captured in this table. • Present-day (field): Observing implications through a multisector perspective from leaders who are shaping the future of the metaverse as captured in Table 5 of this report.

WG	FG-MV Topic Area	Considerations
WG2 Applications & Services	WG2 can address the potential of the metaverse to transform applications and services across numerous existing industrial sectors in the near-term; as well as its potential, in the long term, to eliminate these and other sectors entirely and create new ones.	**Illustrative** For gaming and entertainment, ground zero of immersive technology, the metaverse is already here with a glimpse of near-term implications slicing across industrial sectors: • Social networking and communication in virtual chatrooms, virtual hangout spaces, etc. • E-commerce and retail offering holistic virtual shopping experiences within virtual environments. • Advertising and marketing integrate seamlessly into virtual environments, leveraging user data to deliver personalized experiences and place product. • Real estate and architecture with offer of virtual property tours, architectural visualization, and interior design simulations.
WG3 Architecture & Infrastructure	On the topic of architecture, WG3 can discuss implications resulting from functionality, interface, connectivity, and interoperability of the metaverse. While infrastructure can address the implications surrounding requirements and technical solutions that support metaverse platforms and services.	**Illustrative** Metaverse architecture has significant implications in shaping how users interact with virtual environments and one another, for example: • Functionality: The use of realistic graphics, haptic feedback, and immersive audio to create immersive experiences; and the use of AI algorithms to analyse user behaviour, preferences, and context to personalize these experiences. • Interface: Using Natural User Interfaces (like gesture recognition, voice commands, and eye tracking) to interact with virtual environments more intuitively and seamlessly, versus facilitating that interaction through wearable devices (like VR headsets, AR glasses, haptic gloves, and motion-tracking sensors). From the perspective of metaverse infrastructure, considerations can include scalable infrastructure, distributed computing, and efficient data management systems; as well as interoperability, security, privacy, and sustainability.
WG4 Virtual/Real World Integration	Virtual/real world integration can unlock the potential of the metaverse to revolutionize the way we interact, collaborate, and experience the world. WG4 can approach implications from the perspective of the mechanisms	**Illustrative** Mechanisms to enhance user experience in the metaverse including AR applications (that can overlay virtual content onto the physical world) and Digital Twin integration (which bring in virtual replicas of physical objects or environments) can blur the boundaries between virtual and physical realms.

WG	FG-MV Topic Area	Considerations
	and applications that make this possible.	Applications for real-world data integration (such as weather information, traffic patterns, and social media feeds) and personal and social identity integration (such as real-world identities, relationships, and social networks) provide contextual relevance and enable continuity.
WG5 Interoperability	Interoperability in the metaverse (referring to the ability of different platforms, applications, and virtual environments to communicate, interact, and share data) will determine its future as a single metaverse or multiple metaverses (multiverse). WG5 can discuss implications as they relate to enabling seamless user experiences, fostering collaboration, and driving innovation.	**Illustrative** Compared to the interoperability of the current Internet, this nascent phase of the metaverse does not offer a unified user experience. Considerations can include: • Cross platform navigation: Communicate with users on different platforms; access digital assets and preferences. • Content and asset portability: Move virtual assets, creations, and preferences across different environments. • Cross platform ownership: User ownership and control of their virtual identities, assets, and data.
WG6 Security, Data & PII Protection	Establishing robust security measures and data protection practices as well as Personally Identifiable Information (PII) privacy is crucial to building user trust and confidence in the metaverse. A discussion of implications for WG6 can address creating safe and trustworthy virtual environments by implementing robust security measures, transparent data practices, user-centric privacy controls, standardization, and ethics.	**Illustrative** Some implications related to ensuring user trust, privacy, confidence, and a safe virtual environment include: • Efforts to ensure their personal information, virtual assets, and interactions are secure from unauthorized access, manipulation, or theft. • Privacy protection and data minimization given that the metaverse collects vast amounts of data. • Secure mechanisms to ensure the authenticity, integrity, and ownership of digital assets. • Robust cybersecurity measures to protect against cyber threats, like hacking, phishing, and malware. • Appropriate data governance practices, including data classification, access controls, data lifecycle management, and data breach notification protocols. • Clear guidelines and policies to ensure that user data is not misused, sold, or shared without consent. • Unique considerations for protecting children in this environment. **From WG6 Deliverables** TG on cybersecurity

WG	FG-MV Topic Area	Considerations
		WG6 addresses implications along the lines of the above illustration. Specifically, its Technical Report on "*Cyber risks, threats, and harms in the metaverse*" examines the implications of cybersecurity risks, including impact on user trust, virtual economies, and assets as follows: • Impact on platforms: An increase in data storage may motivate cyber criminals and other actors, possibly increasing the likelihood of data breaches and their severity, which could in turn have significant regulatory and financial consequences. Metaverse providers could also face the risk of potential spill over effects from the digital to the physical world [b-ITU FGMV-10]. • Impact on users and their trust in the platform: As a result of the extensive collection of highly personalized data, it is likely that data breaches of these platforms will result in significant implications to user trust [b-ITU FGMV-10]. • Impact on virtual economies and assets: The use of non-fungible tokens (NFTs) to represent digital assets exposes platforms to implications associated with NFTs including instability and cybersecurity threats. Stakeholders may be less willing to trust platforms, resulting in financial implications for organizations involved and long-term reputational impacts for the metaverse [b-ITU FGMV-10] <u>TG on building confidence and security in the metaverse</u> The Technical Report on "*Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse*" goes beyond the above illustration by addressing the very nature of engagement in virtual worlds as one that has the potential to redefine "reality" by redefining what it means to be "real" and by so doing, transforming human relationship with "reality" in ways that are substantial and irreversible. The report further states that engagement in the metaverse almost mandates the role of users as co-creators, starting with their three-dimensional avatars, providing unprecedented potential for user co-created value [b-ITU FGMV-06]. The Technical Report on "*Considering online and offline implications in efforts to build confidence and security in the metaverse*" addresses the

WG	FG-MV Topic Area	Considerations
		implications of metaverse use and non-use in efforts to build confidence and security in the metaverse. This goes beyond the WG6 illustrative sample by addressing harms relating to metaverse participation even when they do not occur in the metaverse. Specifically, it: • Starts with a historical view by analysing the evolution of the Internet and corresponding evolution in associated risks and harms relating to its use and non-use [b-ITU FGMV-23]. • Explores online and offline implications in user confidence and security over a range of metaverse experiences (defined by immersiveness, fidelity, and sociability) and across a defined bidirectional physical-digital range of user participation (including online, offline, "in-world" and "off-world") relating to its use and non-use [b-ITU FGMV-23]. <u>TG on child online protection</u> In this TG, the Technical Report on "*Responsible Use of AI for Child Protection in the metaverse*", delves into considerations for protecting children in metaverse environments as follows: • Conduct: Children in peer-to-peer associations with opportunities including engagement in civic activities and risks including vulnerability from their own behaviour such as hacking, bullying, or harassing others [ITU FGMV-13]. • Content: Children actively participating in the metaverse with opportunities including access to educational and informative resources and risks including becoming the target of digital scams and malicious codes [ITU FGMV-13]. • Contact: Children engaging with others in the metaverse with opportunities including meeting other children with similar interests and risks including being stalked or bullied [ITU FGMV-13].
WG7 Economic, regulatory & competition aspects	WG7 addresses interrelated areas in the metaverse, with interests that require a balanced approach to protect users, promote innovation, and foster fair competition. Economic, regulatory and competition implications relate to the collaborative efforts	**Illustrative** Economic implications of the metaverse include new paths to revenue creation through virtual asset experiences, advertising, and commerce; economic growth and job opportunities in an emerging metaverse economy; and a surge in innovation, entrepreneurship, and investment in digital technologies and experiences.

WG	FG-MV Topic Area	Considerations
	between industry stakeholders, regulators, and policymakers that are essential to establishing a regulatory framework.	Regulatory implications can address unique challenges and risks associated with collection, storage, and processing of personal data within immersive environments; as well as the translation of existing real-world regulation for activities and transactions that take place in virtual spaces; and the translation of existing real-world regulation for personal culpability. Competition implications: Considerations can include market competition, platform dominance and anti-competitive practices. **From WG7 Deliverables** WG7 further poses questions regarding digital sovereignty of countries in its Technical Report on "*Regulatory and Economic Aspects in the metaverse: Data Protection-Related*", including whether avatars will be citizens, how sovereignty over lands will be exercised and the risk to national values such as freedom of expression and the protection of human rights and dignity [b-ITU FGMV-14].
WG8 Sustainability, Accessibility & Inclusion	To build a sustainable, accessible, and inclusive metaverse, developers, platform operators, and the broader metaverse community must take a proactive and inclusive approach. A discussion of implications for WG8, incorporates these considerations into design, development, and governance.	**Illustrative** Some implications related to creating more sustainable, accessible and inclusive virtual environments that benefit a diverse range of users include: • Sustainability: Physical presence via digital avatars and the use of digital goods and services in place of physical ones. High energy consumption (for vast computational and network requirements) and digital waste (through vast amounts of digital content for virtual assets, environments, and experiences). • Accessibility: Physical accessibility (accessibility features such as customizable controls, text-to-speech and audio descriptions), cognitive accessibility (clear and intuitive user interfaces, simplified language, and support for assistive technologies), and language and localization (support multiple languages and provide localization options). • Inclusion: Social inclusion (regardless of physical location or societal barriers), economic inclusion (for individuals who may face barriers in traditional employment settings), and cultural representation (diverse

WG	FG-MV Topic Area	Considerations
		cultural perspectives, languages, and traditions). • Embrace full participation of all people, particularly from groups that have historically been underrepresented or subject to discrimination. **From WG8 Deliverables** TG on sustainable metaverse design WG8 addresses sustainability considerations along the lines of the above illustration, touching on the following potential risks in its Technical Specification on "*Design criteria and technical requirements for sustainable metaverse ecosystems*": • Duplicating resources as operations span virtual and physical realms, increasing emissions as well as energy and resource consumption [b-ITU FGMV-08]. • Fostering isolation (particularly among the young and vulnerable), distorting human relationships and decision-making (through an idealized reality), perpetuating harmful biases and stereotypes, and further intensifying risks linked to enabling technologies like AI (generating echo chambers and misinformation) [b-ITU FGMV-08]. • Exacerbating power gaps and inequalities among developed and developing regions, rural and urban areas, and large and small enterprises [b-ITU FGMV-08].
WG9 Collaboration	As the collaborative focal point, WG9 can help FG-MV build a vibrant ecosystem while delivering gap analysis and a standardization roadmap for all.	**Illustrative** From the perspective of implications, WG9 could bring together all considerations addressed in each working group into a standardized roadmap that holistically addresses the topic of implications.

7 Current state: Observing implications from the field

7.1 Introduction

The challenge of understanding implications for people in the metaverse is that the metaverse itself has not been in existence long enough to provide a great deal of historical data, and where that data does exist, use cases are fairly limited to gaming and entertainment.

7.2 Objective

This Technical Report therefore conducted individual interviews to help overcome this challenge by gaining access to new and relevant perspectives (including benefits the metaverse can provide and

associated risks), specifically from global leaders (across public, private and third sectors), who can speak with authority about their current work and the work of their nation states, cities, industries, and organizations in shaping the future of the metaverse.

Specifically, the purpose of these interviews is to summarize and contextualize implications from the perspective of these sector leaders as current representative baseline views at the global, regional, state, city, industry, and organization levels.

7.3 Illustrating a multi-sector perspective

To create baseline views that are grounded in research, this report conducted and analysed desk research from which it extracted possible metaverse implications for an illustration of considerations from a multisectoral perspective.

Table 4 illustrates these potential considerations on the topic of implications developed for utilization by this report to provide a baseline for comparison to interview results. The multisectoral perspective of this report will focus on three sectors, defined as follows:

1. Public (or State): The part of an economy which is controlled or owned by the government [b-Webster/public sector].
2. Private (or Citizen): The part of an economy which is not controlled or owned by the government [b-Webster/private sector].
3. Third (or Non-profit): Made up of neither public nor business concerns. The part of the economy that consists of non-profit-making organizations [b-Collins/third sector].

Table 4: Metaverse implications: An illustration of sector perspectives

Sector	Possible Considerations
Public (or State) Sector	As the public sector weighs the value of the metaverse in public services and public enterprises, what is the effect on public goods and governmental services such as infrastructure, law enforcement, public transportation, public education, and healthcare? Some key points to consider include: • Improved internal operations; better service delivery (accessibility, convenience, and efficiency); job creation and economic development. • Developing new policies and regulations (such as regulation of virtual assets); ensuring digital inclusion (connectivity, affordability, and digital literacy); addressing data and privacy concerns (such as data ownership and interoperability challenges) as well as social and ethical considerations (including mental health and well-being).
Private (or Citizen) Sector	If the metaverse does indeed have the potential to transform our lives, livelihoods, and interactions, what are the implications for people engaging in metaverse platforms? What tools would the private sector need to consider these implications? What are the private sector's related responsibilities? Some key points to consider include: • New business opportunities and marketplaces; unique opportunities for customer engagement; remote collaboration and communication (increased productivity, reduced travel costs, and greater work-life balance); innovative talent acquisition and training (improved learning outcomes, and accelerated onboarding); and data and analytics (data-driven decision-making and competitive edge).

Sector	Possible Considerations
	• Navigating intellectual property and copyright considerations; and ethical and social responsibility (addressing privacy, inclusivity, and diversity).
Third (or Non-profit) Sector	Given the unique mechanisms and overall impact of organizations in this sector, the metaverse could be a path to unprecedented reach and positive social change. It is, however, crucial to prioritize inclusivity and responsible practices for the benefit of all. Some key points to consider include: • Enhanced advocacy and awareness; virtual fundraising and donations; collaboration and knowledge sharing; inclusive engagement and participation; volunteer engagement and remote work; impact measurement and reporting; and capacity building and skills development. • Navigating ethical considerations to ensure that virtual activities align with missions and values, including the protection of user privacy and data. • SDOs in this sector can play an important role in pre-standardization during this nascent phase.

7.4 Interview results: Perspectives from the field

In conducting interviews included in this section, this report sought to capture multisectoral perspectives of metaverse implications and observe insights as they relate to benefits and associated risks.

This was especially useful in capturing of-the-moment and on-the-ground information as well as that which could not be observed, feelings, thoughts, and intentions. Understanding these three elements is valuable to contextualizing what can be observed (as presented in Table 4).

The first part (Part 1: Definition) of the interview established the interviewee's history with and understanding of the metaverse (particularly given that there is not yet an agreed-on definition of the term) with three questions:

1. When did you first hear the term "metaverse"?
2. What was your understanding of that term then versus now?
3. How would you compare the "metaverse" to the Internet, social media, or any other communication tool?

The second part of the interview (Part 2: Relevance) established the interviewee's opinion on the current and future relevance/importance of and possible investment in the metaverse with three additional questions:

1. How seriously do you take the metaverse? Is it just hype or will it change everything?
2. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.
3. How could any or all the above benefit from the metaverse? What are the risks?

After establishing the above context, the third part of the interview (Part 3: Implications) focused specifically on implications (the purpose of the interview), to understand positive and negative implications, as well as those which were top of mind with three questions:

1. What concerns you most about the metaverse and how would you suggest mitigating these concerns?
2. What excites you most about the metaverse and how would you suggest maximizing these benefits?

3. What "metaverse implications" are top of mind for you? Are they influenced by current percentage of Internet use in your region? How would you suggest navigating these implications?

Part 3 of the interview also asked for a view from at least one the following perspectives: societal transformation, economic outlook, governance and policy, technological implications, and/or individual empowerment. See additional details in Annex A: Implications Interview Concept Note (*Interviews on implications for people in the metaverse to be included in Technical Report on "Near-term and long-term implications for people in the metaverse"*) approved at the third meeting of the FG-MV, held on 3–5 October 2023, in Geneva, Switzerland.

25 interviews were conducted with interviewees generally aligned to the areas of implications proposed in Table 4. The results revealed that implications that were most pressing for interviewees were often related to the metaverse as an enabler of new types of access, interactions and opportunities for education and the economy. This was a positive and, in some cases, exciting prospect.

Interviewee concerns were often regarding:

1. The role of unequal access to Internet infrastructure in deepening inequalities.
2. Exacerbation of current issues associated with the use of social networks including data privacy, security, child online protection, crime and the digital divide.
3. The development of policy and regulatory frameworks to help shape a safe and inclusive environment.

There was consensus (especially given its cross-border nature) that international cooperation was needed to develop joint standards and support efforts to close current gaps in access.

Table 5 below provides a high-level summary of each interview including perspectives to help guide efforts to maximize benefits and minimize associated risks. The full interviews can be found in Annex C of this report.

Table 5: Interview Results: Summary of field perspectives

Sector	High-Level Summary of Interviewee Perspectives
Public (or State) Sector	Mr Belal Al-Hafnawi, Commissioner and Member of the Board, Telecommunications Regulatory Commission Jordan (Middle East) | Link Part 1: Definition ○ ***First heard the term*** in 2021when Facebook became Meta. ○ ***Understanding then and now*** is that it is a virtual world to represent the real world. ○ ***In comparison to Internet/social media***, will use the Internet and have platforms like social media. Part 2: Relevance ○ ***Hype stage*** hasn't yet disrupted business due to technology limitations and platforms maturity. ○ ***Not important*** no real need for metaverse. ○ ***Benefits/risks*** will be based on human needs. Part 3: Implications ○ ***Implications most concerned about*** are resilient connectivity, security, real world and virtual world integration, and ecosystem spread across geography and jurisdiction. ○ ***Implications most excited about*** are in relation to tourism, education, and government services. ○ ***"Top of mind" implications***: Need for high-speed Internet infrastructure and further spread of 5G and emerging technologies.

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Technology implications***: Countries need to upgrade to advanced telecommunication infrastructure as this is needed for adoption. International collaboration is key to cost reduction and global representation. Mr Carlos Manuel Baigorri, President, National Telecommunications Agency (ANATEL) Brazil (Americas) | Link Part 1: Definition ○ ***First heard the term*** in 2021 through media coverage. ○ ***Understanding then***, was limited to virtual realities ***and now*** is that it extends to industries. ○ ***In comparison to Internet/social media***, it builds on these previous generations of the Internet. Part 2: Relevance ○ ***Anticipation stage*** likely somewhere between hype and a digital revolution. ○ ***Importance*** relies on a synergistic evolution with telecommunications to realize their full potential. ○ ***Benefits*** include possibly driving significant investments in the telecommunications sector. Part 3: Implications ○ ***Implication most concerned about*** is exacerbation of the existing digital divide. ***Mitigation*** could include promoting competition to reduce prices and public policies to universalize connectivity. ○ ***Implication most excited about*** is the potential to revolutionize long-established industries/habits. ○ ***"Top of mind" implications***: Potential to exacerbate current issues associated with use of social networks such as the spread of disinformation, challenges to human rights, and the digital divide. ○ ***Technology implications***: International collaboration is required to facilitate standards development for scale and affordable access (increase investments and reduce prices of network architecture). Mr José de la Uz, Mayor, Las Rozas Spain (Europe) | Link Part 1: Definition ○ ***First heard the term*** in connection with famous video games like Second Life. Started paying attention in 2021when Facebook became Meta. ○ ***Understanding then*** was that it was limited to video games/educational apps ***and now*** is that it has vast application and – along with other technologies – could play an important role in daily life. ○ ***In comparison to Internet/social media***, it's another communication channel (like early Internet). Part 2: Relevance ○ ***Not hype,*** I take it very seriously, following its evolution and engaging in pilot projects. ○ ***Its importance*** is too early to determine. ○ ***Benefits/risks*** remain to be seen but Las Rozas is open to its use to improve the quality of life of its inhabitants and manage the work of the municipality. Part 3: Implications ○ ***Implications most concerned about*** are cybercrime (State sovereignty, avatars' actions, etc.), data privacy (sensitive information about inhabitants) and child protection (addiction, mental pathologies, child abuse/pornography, etc.). ***Mitigation*** could include early education and monitoring use. ○ ***Implication most excited about*** is the promise of a new communication channel and new ways of learning and building prosperity. Best way to ***maximize benefits*** is to use it responsibly, which requires a commitment and efforts to educate users, especially those most vulnerable.

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Governance & policy implications***: The European Union and its Member States already have a solid regulatory basis for the protection of users (especially minors, the disadvantaged, and older persons). Important to strike a balance between protection of the public and development of the technology. Mr Daniel Vega Díaz, Technical Secretary, Spanish Network of Smart Cities (RECI) Spain (Europe) | Link Part 1: Definition ○ ***First heard the term*** in *Ready Player One* (2011); made real when Facebook became Meta (2021). ○ ***Understanding then*** was that it was utopian, or video games far removed from real world issues ***and now*** is that it has much greater potential for education, health, mobility, and city government. ○ ***In comparison to Internet/social media***, it shares many features with the beginning of any emerging technology: significant economic investment, high social expectations, uncertainty about potential. Part 2: Relevance ○ ***Not hype,*** I take it very seriously (very strong indications about its potential), but I am cautious. ○ ***It is important*** with the potential to positively transform the way cities address challenges. ○ ***Benefits*** include better interconnection and collaboration among cities; tools to simulate real-world environments; and additional economic opportunities. Part 3: Implications ○ ***Implications most concerned about*** are: 1) Regulation of citizens' behaviours in the metaverse; 2) Need for standardization and interoperability; 3) Anthropological: "Why does a metaverse exist?". ○ ***Implication most excited about*** is its potential to improve so many areas of people's lives: health, mobility, public administration and citizen relationship, social interactions, and the technology itself. ○ ***"Top of mind" implications***: Major cultural change (from an analog to a digital society) and possibilities for better connectivity and teamwork to generate innovative solutions at the city level. ○ ***Technology implications***: At an embryonic stage, even as Spain's strategic digital plan for 2025 prepares for the total deployment of 5G technology throughout the country. International collaboration is necessary to network and progress more efficiently, as well as for economic reasons. Mr Luis Nava Guerrero, Mayor, Querétaro Mexico (Americas) | Link Part 1: Definition ○ ***First heard the term*** about 10 years ago in the public domain. ○ ***Understanding then*** was a way to interact more, not differently ***and now*** is a new universe, with qualitative differences in user experience (perception you can reach and interaction you can have). ○ ***In comparison to Internet/social media***, qualitative change in user experience from sharing and receiving data to interacting with people (possibly including sensory perception). Part 2: Relevance ○ ***Not hype,*** poised to change social, political, cultural, and economic life in ways that we cannot yet anticipate (just as the Internet and social media before it). ○ ***Important*** for its potential to create better living conditions (including jobs to develop its products). ○ ***Benefits*** include fostering better communication between populations and public institutions.

Sector	High-Level Summary of Interviewee Perspectives
	Part 3: Implications ○ ***Implications most concerned about*** are: 1) Risk of breaking social ties (instead of a tool for life, the metaverse becomes life itself); and 2) Creating a new space for crime (including organized crime). **Mitigation** could include efforts to 1) Increase public awareness of implications; and 2) Anticipate risks to prevent lagging behind in crime prevention (as with the Internet). ○ ***Implication most excited about*** is enhancing communication between people, through experiences. ○ ***"Top of mind" implication*** is that benefits to education and the economy are a factor of equality not inequality. This can be **navigated** through accessibility of technology and guidance in its use. ○ ***Implications as they relate to…*** *Societal Transformation*: Opportunity to interact in ways never imagined creating new realities and cultural products; resulting in a new spectrum of communication, language, and culture. *Economic Outlook*: Use in established industry and markets; and creation of new markets, products, experiences, and companies (a tool and space for entrepreneurship and employment). Opens a new realm of opportunities in education to support inclusive strategies (geographic and economic). *Governance & Policy*: Need to research how best to protect private and sensitive information that may now be vulnerable to new forms of hacking in the metaverse and establish regulation. *Technology implications*: Accessibility of material technology, infrastructure and equipment must be addressed; international cooperation is needed especially for resources to developing countries. It can also promote important and inexpensive support to the Sustainable Development Goals. *Individual Empowerment*: The metaverse opens a new area of opportunities to access knowledge, establish new relationships, and explore new ways of life for personal development and enrichment. Dangers can include addiction, acquiring false identities and in some cases getting "trapped". Ms Gema Igual, Mayor, Santander Spain (Europe) | Link Part 1: Definition ○ ***First heard the term*** referred to in literature and later when Facebook became Meta (2021). ○ ***Understanding then*** was that it was an ethereal concept still in development ***and now*** is related to publicly available developments in virtual worlds and potential use in the future of our cities. ○ ***In comparison to Internet/social media***, it goes beyond both to create a fully immersive experience in virtual worlds where users can express themselves through avatars and interact in real time. Part 2: Relevance ○ ***Anticipation stage***, too soon to know if it's just hype; Santander is exploring it with a balanced perspective, considering its immense potential and accompanying risks, challenges, and limitations. ○ ***It plays an important role*** for residents and visitors. Santander plans to explore potential use (in tourism, urban planning, education, etc.) and analyse implications from different perspectives. ○ ***Benefits*** include enhancing visitor experience for tourism destinations like Santander (reshaping the tourism industry). Some ***risks*** encompass ethical concerns, privacy and data security, disruption of traditional businesses (economic), digital divide and accessibility.

Sector	High-Level Summary of Interviewee Perspectives
	Careful planning and the establishment of clear regulations, standards, and guidelines could help ***mitigate*** these risks. Part 3: Implications ○ ***Implications most concerned about*** are privacy and security issues. Implementing data protection techniques (transparency and accountability) and ethical guidelines (for identities) could ***mitigate***. ○ ***Implications most excited about*** are the ability to reshape many areas within the smart city paradigm (retail, arts and culture, mobility, logistics, etc.); and opportunities for local entrepreneurs to identify and develop new business models. As decision makers, we can ***maximize benefits*** by being responsible, respecting ethical considerations and working towards a shared vision. ○ ***"Top of mind" implications*** are: 1) Increased urban inequalities and the digital divide within cities; 2) Privacy and security issues; 3) Social impact and ethical considerations; and 4) Responsible use. Collaboration between different stakeholders will be needed to ***navigate*** (by improving existing Internet infrastructures, promoting digital inclusion, and providing affordable access). ○ ***Implications as they relate to…*** *Societal Transformation*: Redefining social interactions and creating innovative communication tools. Opportunity and responsibility to shape an inclusive space where everyone feels represented. *Governance & Policy*: Global leaders should collaborate to create policy frameworks. Developing regulations and interoperability standards to prevent the creation of a fragmented metaverse. Ms Jung-Sook Park, Secretary-General, World Smart Sustainable Cities Organization (WeGO) Republic of Korea, (Asia) | Link Part 1: Definition ○ ***First heard the term*** during Seoul's development of its metaverse platform (2021). ○ ***Understanding then and now*** is a realm where virtual and reality converge. ○ ***In comparison to Internet/social media***, Internet/social media primarily facilitate communication through text, images, and video (two-dimensional); the metaverse is a three-dimensional space. Part 2: Relevance ○ ***Not hype,*** with distinct offerings exclusive to public services, WeGO, along with its member cities, are committed to the continued pursuit of initiatives in this field. ○ ***Important***, as it offers unparalleled experiences to its users. ○ ***Benefits*** include individual experiences that are unattainable (in reality). These can be maximized by ensuring credibility of digital twins, and social trust (with consensus on protocols and ethics). Part 3: Implications ○ ***Implication most concerned about*** is the emergence of social issues (for example, users becoming desensitized to discomfort caused by interactions). An example of ***mitigation*** efforts is Metaverse Seoul's proactive implementation of "Metaverse Seoul Code of Ethics", which defines boundaries between reality and the virtual space to establish ethical standards within the virtual realm. ○ ***Implication most excited about*** is the capacity for individual influence in the virtual realm without repercussions in the real world. This can be ***maximized*** with citizen engagement and direct contributions (user generated content). Public support and technological progress are essential. ○ ***"Top of mind" implications***: 1) Its enablement of user experiences that are challenging (in reality); and 2) The anticipation of elevated integration and increased utility of metaverse services, facilitated by advancements in implementation technology and corresponding improvements in Internet speed.

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Technological implications***: It is essential for each virtual space within the metaverse to eventually establish an integrated network which will require the collaboration of international stakeholders to propose standards for the metaverse (as was done for the Internet). With this in place, it is conceivable that the metaverse could experience growth comparable to the evolution of the Internet. Ms Malini Ramalingam, Head, Digital Demand Creation Department, Digital Ecosystem Development Division Malaysia (Asia) | Link Part 1: Definition ○ ***First heard the term*** during 2020 conversations on AI, AR/VR, blockchain, 5G. ○ ***Understanding now*** relates to depth and breadth of implications, benefits, and challenges. ○ ***In comparison to Internet/social media***, it emphasises immersion, interactivity, and the creation of persistent digital environments. Part 2: Relevance ○ ***Not hype***, as regulators, we recognize its potential to impact society as well as the economy. ○ ***Important*** to telecommunications regulators as it intersects with network infrastructure related issues, digital inclusion, data privacy, content regulation, etc. Regulators are likely to play a crucial role in shaping the regulatory framework for the metaverse as it continues to evolve. ○ ***Benefits***: May contribute to economic growth (and job creation), innovation and technological advancements, global collaboration, digital inclusion, and enhanced regulatory enforcement. Part 3: Implications ○ ***Implication most excited about*** is its capability to transform the way we work, play, learn, and interact, offering a new dimension of possibilities and experiences. ○ ***"Top of mind" implications***: 1) Privacy and data security (content regulation, moderation, and regulatory frameworks development); 2) Internet penetration (accessibility, population readiness); and 3) Regulatory environment (who can participate and how). **Navigating** implications requires a combination of responsible governance (continuous assessment), technological innovation, public awareness, and a commitment to ensuring that the metaverse benefits all members of society. ○ ***Governance & policy implications***: Creating regulatory and policy frameworks will require collaboration between governments, industry stakeholders, technology companies, and the global community to ensure a safe, innovative, and inclusive space while respecting principles of privacy, security, and individual rights. The collaborative efforts of nations can help create a more predictable and responsible metaverse environment that benefits all users and promotes global digital harmony. Mr Bartolomé Pujals Suárez, Director General, Government Office of Information and Communication Technologies (OGTIC) Dominican Republic (Americas) | Link Part 1: Definition ○ ***First heard the term*** in 2020 referring to virtual spaces for projects creating 3D virtual worlds. ○ ***Understanding then*** was that it was a novelty ***and now*** is that it is a new form of collaboration bridging the gap between the physical and the digital worlds. ○ ***In comparison to Internet/social media***, it expands on the Internet with three-dimensional virtual spaces and on social media with audio-visual and realistic avatars (immersive virtual experiences). Part 2: Relevance ○ ***Not hype***, may fundamentally transform the way we work, and relate to one another; and could have a lasting impact on society and our conception of digital reality.

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Important*** new forms of collaboration and citizen engagement with the potential to strengthen the relationship between the government and citizens. It could contribute to economic diversification and project the cultural richness of the region globally. ○ ***Benefits*** include enhanced efficiency in delivering government services; fostering citizen participation; and the potential for new economic opportunities (virtual tourism, online cultural promotion, etc.). ***Risks*** include potential exclusion of those without digital access, a technology skills gap, and concerns related to privacy and security. ***Mitigating*** risks will require inclusive policies, digital education programs, and robust privacy safeguards. Part 3: Implications ○ ***Implications most concerned about*** are the digital divide and social exclusion. These can be ***mitigated*** by digital inclusion programmes (for equitable access especially in rural areas); policies to protect user privacy; and promoting participation of diverse groups (to avoid discrimination). ○ ***Implication most excited about*** is fostering the unique cultural expression of the Dominican Republic and the Caribbean. This can be ***maximized*** by supporting initiatives that showcase the cultural richness of the region to preserve and share our heritage globally. ○ ***"Top of mind" implications***: Unequal access in the region (given existing gap in Internet access) and potential for violence and discrimination (with no regulation in these environments). These can be ***mitigated*** by investing in digital infrastructure to expand connectivity; and designing inclusive policies to consider the region's economic realities and promote equitable participation. ○ ***Implications as they relate to…*** *Societal Transformation*: A tool to overcome geographical barriers and connect communities. *Economic Outlook*: Locally, could catalyse sectors like virtual tourism. Globally, engagement in virtual economies could diversify national income and create new employment opportunities. *Governance & Policy*: Locally, could lead efforts to establish regulatory frameworks. Globally, active participation in international forums to influence the creation of global standards. *Technological Implications*: Locally, could invest in technological research and development. Globally, research collaboration with other countries could enable the sharing of knowledge and collective advancement in areas such as artificial intelligence and virtual reality. *Individual Empowerment*: Locally, education and training programs could prepare Dominican citizens to actively participate, enhancing their personal and professional growth. Globally, the Dominican Republic could share best practices with other nations to address common challenges such as addiction and mental health.
Private (or Citizen) Sector	Mr Manuel Barreiro, Founder, Partner, and Chairman, Aston Group Mexico (Americas) | Link Part 1: Definition ○ ***First heard the term*** in 2004, from science fiction and technology enthusiasts. ○ ***Understanding then*** was that it was a distant, futuristic idea (virtual universe where people interacted and engaged) ***and now*** is that it is a plausible extension of our digital lives (convergence of virtual and real-world experiences). ○ ***In comparison to Internet/social media***, transcends information exchange (immersive and interactive digital space). Part 2: Relevance

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Not hype***, represents an evolutionary step in our digital landscape. ○ ***Important to*** real estate: 1) Industry (transformative shift in the way properties are showcased, marketed, and experienced); 2) Functions/Organizations (could redefine sales, design, and urban planning); and 3) City/State (could influence development, architectural design, and regulation). ○ ***Benefits*** to the real estate industry include breaking free from geographical limitations; **risks** include misleading or inaccurate presentations, leading to dissatisfaction or legal issues. Part 3: Implications ○ ***Implications most concerned about*** are privacy and security. These can be ***mitigated*** with robust protocols to safeguard identities and data, education, and transparent policies. ○ ***Implication most excited about*** in real estate, is the potential for a revolutionary shift in how properties are experienced and transacted. These can be ***maximized*** by embracing technology and setting industry standards for ethical and accurate virtual property representation. ○ ***"Top of mind" implications*** include ethical considerations and impact on personal well-being. These can be mitigated with 1) Proactive education and awareness campaigns (responsible and ethical behaviour); 2) Development and implementation of clear policies and guidelines (privacy, security, and digital citizenship); 3) Investing in mental health support and resources; and 4) Promoting and supporting research and development (user well-being and safety). ○ ***Economic implications***: Economic driver that could yield significant growth, innovation, and opportunities across various sectors, including 1) Entertainment (revolutionary shift in content creation and consumption); 2) Education (new dimension for learning); 3) Commerce (revolutionizing how we shop and conduct business); and 4) Employment (new job categories creating challenges and opportunities for the workforce in Mexico and Latin America). Dr Ashraf Darwish, Professor of Computer Science, Faculty of Science, Helwan University Cairo, Egypt (Middle East) | Link Part 1: Definition ○ ***First heard the term*** in 2021. ○ ***Understanding then and now***: Virtual world. ○ ***In comparison to Internet/social media***, next generation of the Internet, surpassing two-dimensional limitations; social media is a distinct component of the Internet enabling individual social interactions, whereas the metaverse aims to provide a whole digital realm. Part 2: Relevance ○ ***Not hype***, with considerable interest and investment. Has the capacity to fundamentally transform digital interactions, professional endeavours, and recreational pursuits. Long-term implications are contingent on tackling technical, ethical, and social concerns. ○ ***Importance*** varies across sectors, functions, and geographic regions, contingent on rate of adoption and regulatory decisions; with economic, social, and cybersecurity implications. ○ ***Benefits*** across multiple industries through augmentation of distant cooperation, immersive education, and novel forms of entertainment; with ***risks*** including privacy concerns, digital addiction, security threats, and the possibility of businesses exerting monopolistic power. Part 3: Implications ○ ***Implications most concerned about*** are privacy, security, and monopolistic power. Could be ***mitigated*** with data protection; proactive measures for equal access and affordability; diligent antitrust measures; and establishment of open standards.

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Implications most excited about*** are the capacity to foster inventive and immersive encounters and facilitate worldwide interconnectedness. These can be ***maximized*** by promoting open and collaborative development and inclusive engagement; fostering a wide range of contributions; and allocating resources for infrastructure development. ○ ***"Top of mind" implications*** are privacy, data security, digital addiction, and digital divide. These can be ***navigated*** through international cooperation and development of data protection and cybersecurity protocols, and digital literacy and regulatory frameworks. ○ ***Implications as they relate to…*** *Societal Transformation*: Facilitate enhanced inclusive engagement, global communities, and creation of digital economies. Could exacerbate existing disparities (digital divide). Advanced encryption and privacy technologies could enhance personal data protection but may give rise to apprehension regarding surveillance and potential abuse. Ethical rules and laws could foster responsible conduct but must strike a balance between safeguarding freedom of expression and curbing hate speech, harassment, and unlawful conduct. *Economic Outlook*: Observable economic drivers within the metaverse include, 1) Novel real estate market (sale and development of virtual land and properties); 2) Economic activity (sale of digital goods and services); 3) Advertising and marketing (engaging an involved worldwide audience); 4) Education and Training (immersive and interactive learning experiences); 5) Remote work and e-commerce (virtual offices and digital markets); and 6) Entertainment (immersive experiences and interactive storytelling). *Governance & Policy*: Global leaders can engage in developing legal and legislative frameworks using international agreements and organizations to formulate shared rules. *Technology Implications*: International collaboration can help consolidate resources, establish standards, and foster research. *Individual Empowerment*: Participation in immersive learning experiences, virtual support groups, and skills enhancement. More screen time and digital isolation may give rise to mental health issues and increase the likelihood of online harassment or identity theft. Mr Sébastien Devaud (Agoria), Co-founder, InFiné; Digital Artist, DJ, Composer and Music Producer France (Europe) | Link Part 1: Definition ○ ***First heard the term*** 12 or 13 years ago in a video of writer, Phillip Caddick. ○ ***Understanding then and now*** is that it is an extension of our perception of real life. ○ ***In comparison to Internet/social media***, there is no comparison as the metaverse is a way of expanding your reality, consciousness, and possibilities. Part 2: Relevance ○ ***Not hype***, part of a much bigger picture transforming the way we see reality. The start of a metamorphosis that can take many directions. ○ ***Important***, a fantastic game field, a new perspective, immense and perpetual. ○ ***Benefit*** is global collaboration. ***Risks*** include 1) Limiting the metaverse to an entertainment or economic tool; and 2) Scams and hacks especially relating to stolen and baiting identities. Part 3: Implications

Sector	High-Level Summary of Interviewee Perspectives
	○ ***Implications most concerned about*** are scams and hacks. These can be ***mitigated*** by educating users about their own actions in the metaverse and the metaverse ecosystem itself. ○ ***Implication most excited about*** is a fundamental shift in our belief system. I think religion has been replaced by a current belief in consumption. The metaverse could help replace this belief with a belief in ideas (not as they appear, but in ideas regarding new perspectives). ○ ***Implications as they relate to…*** *Societal Transformation*: We used to live with the emotion we have when we buy static art or any static object we decided to bring home as a testimony of our taste and identity. The metaverse could help us transition from static art (paintings, etc.) to art in constant evolution. *Governance & Policy*: Frontiers, territories, and barriers create so much pain, so much hate. If we could manage the metaverse to bring more peace, we should embrace it. *Individual Empowerment*: The metaverse is a place to create, entertain, and educate; but can be problematic for those who seek to escape their lives. I don't believe it will create addiction, but people with addictions may engage (not because the metaverse is attractive for that reason). Dr Alex Howland, President and Co-founder, Virbela United States (Americas) | Link Part 1: Definition ○ ***First heard the term*** in Neil Stephenson's novel, *Snow Crash*. ○ ***Understanding then*** was a dystopian sci-fi view (speculative and futuristic concept) ***and now*** it's tangible with advancements in technology and virtual reality becoming more accessible. ○ ***In comparison to Internet/social media***, it builds on the Internet, social media, and other communication tools, while offering a more immersive and interconnected experience. Part 2: Relevance ○ ***Not hype***, although I don't take the term all that seriously, I take the concept and the idea seriously and view its technology offerings as tools to drive value in diverse settings with the potential to make a lasting impact and redefine the way we live, work, and socialise. ○ ***It is important*** at Virbela, where we are focused on the enterprise metaverse (application to the business landscape). ○ ***Benefits*** in the enterprise metaverse includes many innovative solutions to longstanding business challenges and new possibilities for collaboration, communication, and operations. Part 3: Implications ○ ***Implications most concerned about*** are 1) Resistance to change (individual and societal level); 2) Potential for bullying and misbehaviour (replicating real-world issues such as harassment and discrimination); and 3) Ecosystem readiness (high cost of VR headsets and customization tools). These could be ***mitigated*** with 1) Proactive education and awareness building; 2) Robust moderation systems; and 3) Reporting mechanisms and community guidelines. ○ ***Implication most excited about*** is its potential to revolutionize the way businesses operate. This can be ***maximized*** by investing in metaverse platforms, ecosystem, and technology development, establishing robust security measures, and developing ongoing user education. ○ ***"Top of mind" implications*** relate to the success and widespread adoption of enterprise metaverse including hardware accessibility, platform quality, organizational readiness, and resolution of social, economic, and ethical considerations.

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	○ ***Technological implications***: Continue to advance: 1) Immersive technologies (in virtual environments); 2) AI and machine learning (interactivity and responsiveness); 3) Scale and stability (large user base); 4) Accessibility and affordability (diverse global participation); 5) Usability, localization, and translations (diverse linguistic and cultural backgrounds); 6) Policy development and ethical standards (development and use); 7) Shared privacy expectations (privacy-preserving technologies and transparent data handling practices); and 8) Technological convergence (interconnected virtual spaces, applications, and services). International collaboration can foster a global perspective, integrating diverse cultural insights, and contribute to the creation of a more inclusive, ethical, and user-friendly metaverse experience. Dr Pilar Orero, Professor, Universitat Autònoma de Barcelona Spain (Europe) | Link Part 1: Definition ○ ***First heard the term*** many years ago when Second Life became popular. ○ ***Understanding then*** is that it was a communication platform inspired by videogames ***and now*** that it is a system requiring no human interaction, but ingesting data from humans. ○ ***In comparison to Internet/social media***, there is no need for human interaction to communicate in the metaverse while social media/communication tools are for humans. Part 2: Relevance ○ ***Not hype***, it should change everything. ○ ***Important***, with massive implications for education and research. ○ ***Benefits*** are endless and include work, education, entertainment, family, etc. Part 3: Implications ○ ***Implication most concerned about*** is who will regulate and what standards they follow. ○ ***Implication most excited about*** are research questions like avatars and digital humans. ○ ***"Top of mind" implication*** is the need to act as fast as possible to produce standards and appoint a regulator for governance. ○ ***Implications relating to individual empowerment*** include the metaverse's potential to significantly exacerbate the digital gap. Action is needed to avoid massive exclusion.
Third (or Non-profit) Sector *Includes Non-Governmental Organizations*	Ms Natalia Bayona, Executive Director, United Nations World Tourism Organization Link Part 3: Implications ***Implications as they relate to…*** *Societal Transformation*: This includes the potential to enhance human interaction by expanding meaningful exchanges between people across diverse backgrounds, languages, and geographies. For the travel sector, this means more people will have access to potential destinations and experiences, which may result in increased interest in traveling. Travel sector related opportunities also include broadening accessibility and inclusion, and virtual tourism to restricted or inaccessible locations. The metaverse may face privacy and ethical risks in its early years as regulators catch up to the innovators. *Economic Outlook*: Virtual and augmented reality are expected to contribute USD 1.5 trillion to global GDP by 2030 compared with USD 46 billion in 2019 and these benefits are set to increase to USD 3.6 trillion by 2035. The metaverse's potential impact on the global economy is significant, driven by opportunities across sectors including the

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	entertainment sector where live music concerts have experienced a 10x growth from 2020 to 2021, catalysed in part by the global pandemic. *Governance & Policy*: Collaboration across a broad range of stakeholders, including academia, innovators, entrepreneurs, and global leaders is needed to advance the development of effective guidelines to spur innovation while safeguarding citizens. As the metaverse is dynamic and fast-changing, coordination between the technical and political spheres is critical to ensuring policymakers are informed by developments in the field. Experts can collaborate to identify needed guidelines as well as risks that can be addressed by cooperation and regulation. *Individual Empowerment*: In the tourism sector, the metaverse is currently being utilized to increase training and learning opportunities for staff. At the individual level, enhanced access to learning opportunities and modes of education enables personal growth and education. More broadly, the metaverse can be used to enhance skills for the workforce of various sectors. Risks include overutilization, which may lead to mental health or metaverse addiction implications. Dr David Bray, Co-Chair & Distinguished Fellow, Alfred Lee Loomis Innovation Council, Henry L. Stimson Center United States (Americas) | Link Part 1: Definition ○ ***First heard the term*** circa 1992 in Neil Stephenson's novel, *Snow Crash*. ○ ***Understanding then*** was in a science fiction context ***and now*** is that virtual worlds and later Facebook (now Meta) brought back concepts with better equipment, software, and interfaces. ○ ***In comparison to Internet/social media***, the Internet is composed of the TCP/IP, which includes an application layer; social media and metaverse also sit on that layer. Some have said metaverse may sit on a spatial computing layer that still is an extension of the application layer. Part 2: Relevance ○ ***Whether its hype*** depends on the definition; if Facebook/Meta's, interesting ideas but didn't translate well into business reality; if Apple's, remains to be seen. ○ ***Not important*** currently and overshadowed by the AI zeitgeist. ○ ***Benefits*** are tied to whether people can afford and access the hardware necessary to navigate, and if their behaviour is cooperative or asocial in virtual environments. Part 3: Implications ○ ***Implication most concerned about*** return to first principles: 1) What do people need (individually and collectively); 2) How might those needs be addressed; and 3) Can the metaverse address those needs. ○ ***Implication most excited about*** is that the metaverse could help people overcome geographical limits and limits of perception and physical identity. ○ ***"Top of mind" implications*** are hardware affordability and access and behaviour in virtual environments. ○ ***Implications as they relate to…*** *Governance & Policy*: Are the challenges here any different than the Internet's existing geographical blurring issues, especially in cyberspace? How will AI challenge geographical boundaries? *Individual Empowerment*: If we can overcome user experience hurdles, the metaverse may be most useful as an individual tool (part of a large technology play that includes data, AI, etc.). Mr Noel Curran, Director General, European Broadcasting Union Europe | Link Part 1: Definition

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	○ ***First heard the term*** when Facebook became Meta in 2021. ○ ***Understanding then*** was that it was an immersive and interactive personal experience enabled by virtual glasses ***and now***, experiences in an immersive 3D virtual space focused on social connection and gamification. ○ ***In comparison to Internet/social media***, the metaverse is an attempt to add multi-user gamification to the means and functions the Internet now provides to society. Part 2: Relevance ○ ***Not hype***, we see the metaverse as an experiment in motion that: 1) Informs thinking around future media content and experiences; 2) Could trigger technological developments that could remove barriers to access; and 3) Provides hints of future content creation capabilities. For the media sector and our members, these points have proven substantial enough to warrant keeping an eye on them. ○ ***Important***, with opportunities to transform the way in which we interact with audiences, across entertainment, culture, and news. ○ ***Benefit*** is as a basic facilitator with potential ***risk*** of social isolation. Part 3: Implications ○ ***Implications most concerned about*** are strategy and costs; technical capability and content format; intellectual property and regulation; user engagement and moderation; and safety and legal considerations; can be ***mitigated*** with knowledge share and cross-collaboration. ○ ***Implications relating to individual empowerment***: Potential to improve personal education by making it available independently from geography (e.g., in the context of migration, etc.) and by facilitating emotional connection. Existing social media risks could be further magnified by immersive experiences. Need strategies to manage risks such as bullying, stalking, trolling, intimidation, inappropriate content, radicalization, and the erosion of other 'vertical social layers' such as family or schooling. Dr Araba Sey, Deputy Director, Research ICT Africa South Africa (Africa) | Link Part 1: Definition ○ ***First heard the term*** about two years ago, shortly before Facebook became Meta in 2021. ○ ***Understanding then*** was that it was a new product Facebook was developing to offer more immersive virtual/online experiences ***and now*** no longer associate it solely with Meta. ○ ***In comparison to Internet/social media***, they are essentially the same in terms of being platforms for engagement in cyberspace (social, economic, political, etc.) with the main difference appearing to be enabling higher levels of immersion. Part 2: Relevance ○ ***Hype*** for most people; will also probably change everything for some people. ○ ***Relatively unimportant*** to my industry (research), function (research and people management), organization or geographic location (Africa and the US). Not yet clear on what it offers that cannot to a greater or lesser degree already be achieved via previously existing platforms and technologies. ○ ***Risks*** include 1) Real world dangers, harms and injustices replicated; and 2) Becoming another fault line along which new digital divides and social/economic exclusions emerge. Part 3: Implications ○ ***"Top of mind" implications***: Further expansion and deepening of digital and social divides. To some degree, this opinion is influenced by relatively uneven distribution of internet-enabled devices and internet access in my regions of interest. While the challenges cannot be completely eradicated, their impact can be potentially lessened by paying attention to global, regional and national

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	experiences with previous and currently more prevalent mainstream technologies and drawing lessons so as not to repeat mistakes of the past. Investments in the metaverse should be balanced with continued investment in the technologies that are most prevalent for most communities. Emerging ecosystems should accommodate nonparticipation for those who are unable or choose not to participate. ○ ***Implications as they relate to*** *societal transformation*, *economic outlook*, *governance & policy*, *technological advancements*, and *individual empowerment*: If history is anything to go by, the metaverse will mostly reinforce existing social, economic, political, technological and personal systems and tendencies. It will be largely driven by entities seeking avenues for commercial gain, especially through datafication of users. Some individuals and communities might be able to leverage features for personal and community development, but as I've noted, I'm unclear on what the metaverse enables that people are not already able to do. Attempting to realize the positive potential of the metaverse will require first clarifying what that potential is in concrete terms and how it is an added value to existing modes of interaction. Mr Mounir Tabet, Deputy Executive Secretary, United Nations Economic and Social Commission for Western Asia (UN ESCWA) Link Part 1: Definition ○ ***First heard the term*** about three or four years ago. ○ ***Understanding then*** was that it related to gaming and a vehicle into immersive environments ***and now*** that it is a potentially powerful tool to advance human potential. ○ ***In comparison to Internet/social media***, the difference is in its immersiveness and timeliness of response. It's many more layers than a conversation, including physical movement and interaction with objects and other people. Part 2: Relevance ○ ***Whether it is hype*** depends on how soon the conversation moves from those who are working on the necessary parts (definition, standards, etc.) to users. The sooner the better. ○ ***Important*** for the Arab region (potential to become a great equalizer of skills and knowledge) and for ESCWA (could significantly reduce need for in-person interaction). ○ ***Benefits*** include immense implications for culture, health, education, tourism, environmental dimensions and agriculture. ***Risks*** include moral and ethical considerations, cybersecurity, multiple identities, and loss of control. The metaverse is too important to be left to the creators alone; it needs interaction by users (starting with the most basic user) to understand fears, values, hopes, and ambitions, so it can respond to a real requirement and not impose a need. Part 3: Implications ○ ***"Top of mind" implications*** are obstacles to adoption including internet connection and inaccessible language that perpetuates fear. Can be ***mitigated*** by identifying potential users, developing language that is accessible to the least sophisticated users, and discussing measures or considerations to enhance security and minimize risks. ○ ***Implications as they relate to…*** *Societal Transformation*: The metaverse will probably augment the level of anonymity we see with social media today, increasing the potential for even further polarization and divisiveness. We need to be evolving our means to address moral and ethical considerations at the same time and pace, to catch up with technology that is moving much faster.

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	Economic Outlook: From an economic and commerce perspective, it opens the door for small players and gives discerning consumers more options (for sustainable preferences, etc.). *Governance & Policy*: I think the margin for public policy is shrinking, and the margin for cooperation and the private sector is growing. Policy frameworks must be reimagined across industries, countries, and boundaries. *Technological Advancements*: The easier to use the better. There should also be consideration for the ability to work with different levels of internet connectivity. *Individual Empowerment*: The world is immensely open and available to the curious and interested; managing overwhelming choices becomes more difficult. Dr Jane Thomason, Emeritus Chair, World Metaverse Council Slovenia (Europe) | Link Part 1: Definition ○ ***First heard the term*** in 2019. ○ ***Understanding then*** was limited ***and now*** is that it is a futuristic concept combining various technologies including AR/VR, AI, and the spatial web. ○ ***In comparison to Internet/social media***, when referring to the metaverse, I am referring to the Web 3.0 Metaverse. Web 3.0 envisions a next generation Internet (Internet of Value). Part 2: Relevance ○ ***Not hype, it is important; benefits*** include contributing to social impact, especially climate action, financial inclusion, health care, land registry, philanthropy, fundraising, etc. Part 3: Implications ○ ***Implication most concerned about*** with metaverse infrastructure still in its early stages and no laws or legal jurisdictions in the metaverse; include: consent (users are informed, understand and their decisions are voluntary); criminal (fraud and misconduct); data (interoperability/portability); governance (closed or open protocols); property rights (applicable law, jurisdiction and identifying infringers); security (phishing, malware, and hacking); social Implications (physical and mental health, online harms including child online harms, moderation, wealth inequality, digital divide); the economy (leaderless, decentralized organizations); and avatars (ethical and legal considerations). ○ ***Implications most excited about*** are new and enhanced ways to live, shop, be entertained, seek services, and be educated; could be fulfilling and rewarding and create social purpose. ○ ***"Top of mind" implication*** is "uberization" will disrupt education as it disrupts transport. ○ ***Implications as they relate to…*** *Economic Outlook*: The Open Metaverse (Internet of Value) will create new economic opportunity for developers with new projects that would be impossible in the real world. *Governance & Policy*: For government, Web 3.0 enables the creation of leaderless, decentralized organizations that blur the jurisdictional boundaries of economic activities. For business, the metaverse can create a new socio-economic ecosystem, with new legal and regulatory requirements, and a new global workforce. Mr Neil Trevett, President & Chairman, Metaverse Standards Forum United States (Americas) | Link Part 1: Definition ○ ***First heard the term*** in 1997, when I read Stephenson's *Snow Crash*.

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	○ ***Understanding then*** was Stephenson's presentation of a fully formed virtual environment enabling sophisticated social interactions, with real-time integration of real-world sensory data, ***and now*** an effective explanation is the "spatial evolution of the web". ○ ***In comparison to Internet/social media***, the existing social media is built on Web 2.0. The addition of spatial computing will create multiple new ways to communicate with our technology and with each other. Part 2: Relevance ○ ***Not hype***, although impossible to predict evolution, it will be hugely disruptive and create significant commercial and social opportunities, but: 1) It has been overhyped before; 2) There is confusion over the term including over-association with NFTs; and 3) The term has been degraded and tainted with dystopian visions that promote the idea of increased social isolation. ○ ***Importance*** is mostly its real-world adoption as the industrial metaverse (using web and spatial computing technologies for designing, visualizing, simulating, and optimizing industrial plants and processes). Enterprises are already operating more efficiently and profitably using these technologies, which will help drive the development and evolution of additional advances needed to bring the metaverse to a broader range of consumers. ○ ***Immediate risks*** include: 1) Need for enormous amounts of intimate personal data sharply exacerbates privacy concerns; 2) With AI as a foundational technology for much of the metaverse, undetectable deep fakes could help amplify the current downside of social media by selling, persuading, and even radicalizing in ways that may be irresistible. Part 3: Implications ○ ***Implication most concerned about*** is that many social concerns raised by AI and the metaverse cannot be addressed by technology alone. Legislation needs to keep pace with technological progress so that privacy, security, identity, and inclusiveness are considered and integrated during the evolution of the metaverse, rather than applied as an ineffective afterthought. Governments should create a "safe space" for technological innovations to benefit society and the environment while minimizing social harm. ○ ***Implication most excited about*** with the metaverse evolving when the overriding existential crisis facing society is climate change; is that industrial efficiencies, new ways of working and interacting at a distance, and the technological and ecological insights made possible through simulation and visualization could make the metaverse a vital and timely tool to help reduce environmental damage. ○ ***"Top of mind" implication*** is that just as widespread internet access can broaden educational and economic opportunities; these benefits will be strengthened by the web's evolution into the metaverse. Social awareness and business or legislative incentives could be put in place to ensure it is inclusive and accessible. ○ ***Technological implications***: If the metaverse is to be a global, accessible platform available to all, it must be based on a foundation of interoperability standards. International bodies should double their efforts to enable and encourage global standardization cooperation. Interoperability is not just a technological concern, legislation across jurisdictions should also be as consistent as possible to avoid a patchwork of incompatible regulations.
Recognized next generation leaders *Multisector*	Ms Tayma Abdalhadi, Technologist, Gender Champion, and GC-ARB Youth Envoy Palestine (Middle East) | Link Part 1: Definition ○ ***First heard the term*** when Meta announced its plans for a Metaverse launch.

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	○ ***Understanding then*** was a blend of augmented reality (AR) and virtual reality (VR), providing an immersive experience limited to specific platforms, gadgets, and software ***and now*** a new approach to online content interaction. ○ ***In comparison to Internet/social media***, the Internet encompasses social media and the metaverse. Social media is a hub for smaller networks of people sharing content on a digital space and interacting with it, the metaverse is a new medium for viewing and interacting with a broader spectrum of content and applications online. Part 2: Relevance ○ ***Not hype***, game changer, particularly in human interaction and child online protection, underscores the importance of approaching it with utmost seriousness and caution. ○ ***Important*** in the context of residing in an occupied and relatively isolated country, potential additional avenues for individual participation (work and educational opportunities) and amplification (voices and experiences of the community). ○ ***Benefits*** could include better sustaining meaningful and enduring virtual engagement in hybrid learning and work and ensuring equitable inclusion. ***Risks*** include: 1) Infrastructure limitations and the high cost of equipment could restrict access; 2) Persistent regional policies limiting access to applications and content; and 3) Additional censorship and inadequate safety measures posing critical concerns for the safety and privacy of users. Part 3: Implications ○ ***Implications most concerned about*** include 1) Privacy and security concerns in the absence of regulation; 2) Elitism and Global South access given the need for hardware and software; and 3) Lack of policy and legal frameworks in many countries to protect user rights and provide necessary customer support. ○ ***Implication most excited about*** is its potential to revolutionize virtual work and education, especially as they have become integral post-COVID. This can be ***maximized*** with robust support, risk mitigation, and transparent data practices. ○ ***"Top of mind" implications*** are influenced by the current limitations in internet accessibility due to infrastructure constraints, limited availability of necessary equipment, and potential content restrictions. May be ***mitigated*** by prioritizing efforts to improve Internet infrastructure, ensure affordable access to required hardware, and advocate for policies that promote inclusivity and protect user rights by collaborating with local communities. ○ ***Implications related to societal transformation***: The metaverse offers a pathway to global connectivity, facilitating diverse interaction and collaboration irrespective of geographical boundaries. Risks include: 1) Deepening of existing inequalities if access is hindered by economic barriers or insufficient infrastructure; 2) Concerns about data privacy; and 3) Ethical considerations, including virtual harassment and the impact on real-world behaviour. Navigating these challenges and maximizing the metaverse's potential calls for robust regulatory frameworks, ethical guidelines, and collaborative efforts involving technology developers, policymakers, and communities. Ms Federica Morici, Founder, Estudiantes Digitales Argentina (Americas) | Link Part 1: Definition ○ ***First heard the term*** when Facebook changed its name to Meta. ○ ***Understanding then*** was for sporadic or leisurely use ***and now*** is a universe that combines technologies of all kinds to synchronize real-time engagement in various daily activities. ○ ***In comparison to Internet/social media***, the metaverse is not a singular technology; it involves the convergence of various technologies to exist. Only

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	through Web 3.0 can we comprehend the progression that has enabled us to transition from simple connectivity tools to social networks and now to the metaverse. Part 2: Relevance ○ ***Not hype***, I believe it has the potential to "change it all" when it is accessible to everyone. ○ ***Important*** to education, enhancing positive impact and diminishes barriers of distance. ○ ***Benefits*** are innumerable in the education sector. Most importantly, the ability to provide education to any (connected) part of the world; and the opportunity for students not only to learn but to live this immersive experience that is considerably closer to in person study. Part 3: Implications ○ ***Implication most concerned about*** relates to knowledge and training to mitigate issues rising from lack of accessibility and digital literacy by promoting a collective commitment from societal stakeholders and cooperating at the national, regional, and international levels. ○ ***Implication most excited about*** is the prospect of an increasingly profound digital era that can be maximized by fostering innovation, investment and entrepreneurship. ○ ***"Top of mind" implications*** revolve around legal and regulatory aspects, the current percentage of internet usage in my region, and issues related to technology education. ○ ***Governance & Policy implications***: I believe we should progress towards a foundational common legislative framework and build upon it, all grounded in international cooperation. This could then be continually adjusted to address issues that may rise due to the evolving nature of technology. Mr Ramu Pandey, President, Youth Council in Action for Nation (YOUTH CAN) Nepal (Asia) | Link Part 1: Definition ○ ***First heard the term*** in 2021, when I was selected to be a Youth Envoy for ITU Generation Connect. ○ ***Understanding then*** was limited, a realm of virtual reality ***and now*** a dynamic, networked digital world where people can interact, create, work, and have fun. ○ ***In comparison to Internet/social media***, seamless fusion of virtual and physical realities that is integrated and immersive in contrast to social media that goes beyond using the Internet to browse or communicate (involves actively participating in a complex, networked digital environment). Part 2: Relevance ○ ***Not hype***, it's poised to redefine our digital and physical realities, making it a transformative force that stakeholders can't afford to ignore. ○ ***Important***, essential to ITU Generation Connect and our youth organization given that its immersive, interconnected nature enables our goal to encourage young people to be globally connected and innovative. In least developed nations like Nepal, the metaverse offers enormous promise for increased access to worldwide resources and educational opportunities; opens the door to e-commerce, digital entrepreneurship, and remote work; and could increase tourism. To fully realize the metaverse's potential in Nepal, however, issues like digital literacy and infrastructure development must be resolved. ○ ***Benefits*** for youth focused organizations are learning, networking and collaboration. Nepal could benefit from access to high-quality educational resources and learning; a boost in tourism; and economic opportunities. ***Risks*** include technological disparity (lack of infrastructure and access to the Internet

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	may widen the digital divide), cultural erosion (if traditional practices are overshadowed by global trends), and privacy and security concerns (especially in nations with limited regulations and safeguards). Part 3: Implications ○ ***Implication most concerned about*** is security and privacy as we incorporate more elements of our lives into the digital sphere. A multifaceted strategy could help **mitigate**, including: 1) Strong encryption techniques; 2) User-controlled data permissions; 3) Decentralized systems; 4) Industry-wide cooperation to establish common guidelines for privacy and data security; 5) Transparent practices and regular audits; and 6) User education. ○ ***Implications most excited about*** are increased access to global opportunities and resources, as well as access to education, social connectivity, and economic opportunity. ○ ***Implications as they relate to…*** *Societal Transformation*: I believe it could revolutionize human interaction by transcending geographical boundaries, potentially creating opportunities for cultural exchange and collaboration, and a more interconnected global community. Challenges include ensuring equal participation from diverse socio-economic backgrounds (considering disparities in access to technology and resources), and privacy and ethical considerations (protecting user data and preventing exploitation or discrimination). *Governance & Policy*: In Nepal, the metaverse presents an unprecedented opportunity for connectivity and innovation. Immersed in this digital landscape, I believe that creating inclusive regulatory frameworks is crucial to ensuring responsible and safe use. Given the metaverse's borderless nature, global leaders must collaborate for inclusive policies, cultural sensitivity, and the balance between innovation and safety. *Individual Empowerment*: The metaverse presents an exciting frontier for personal growth and education; however, concerns about addiction and mental health are significant. Prioritizing mental health support and emphasizing a holistic approach to virtual interactions will be crucial for harnessing its benefits while mitigating challenges. Ms Emilia Zalewska-Czajczyńska, Co-founder, Youth IGF Poland Poland (Europe) | Link Part 1: Definition ○ ***First heard the term*** in 2020 when buzz around this topic was gaining speed due to Meta. ○ ***Understanding then*** was another kind of simulation or game (influenced by familiarity with multiplayer games based in open worlds (like *Minecraft*) and immersive technologies); ***and now*** I understand it to be a phenomenon that would transform the Internet we know into the next generation of it with three fundamental features: immersiveness, interoperability, and decentralisation (according to publications). ○ ***In comparison to Internet/social media***, I see it as a step in the development of the Internet. Part 2: Relevance ○ ***Anticipation stage***, the metaverse has the potential to bring about significant changes; it is already making strides in some areas. However, to transcend mere hype, it must evolve into a space that people genuinely want to use. ○ ***Not important***, I don't believe my function (policy analyst) and primary field of work (cybersecurity) will be significantly affected by the emergence of the metaverse, unlike those involved in the technical aspects of cybersecurity, where

Sector	High-Level Summary of Interviewee Perspectives
	changes can be substantial. In Poland, there is little activity now, but this may change soon given that Poland is part of the European Union, which plans to develop dynamically in the metaverse field. ○ ***Benefits*** in cybersecurity could include new opportunities for specialist training and simulating real-world scenarios safely, quickly, and at a much lower cost. Cities could become greener and more sustainable and accessible with use of virtual models and virtual spaces. However, misuse could lead to excessive collection of citizens' data and intrusion into the system would result in severe consequences including disruption of work. Part 3: Implications ○ ***Implication most concerned about*** with a much wider range of information collected about the user in a single space than in any medium to date, include dramatically increased risks associated with data misuse; and databases becoming attractive targets for attacks. These could be ***mitigated*** with a security and privacy by design approach from the earliest stages of projecting and designing. Users should also be able to choose data they want to share. ○ ***Implications most excited about*** are 1) Education: The potential to turn almost every lesson into an experience and the opportunity for students who live in remote or poorly connected areas to meaningfully participate; and 2) Climate Change: The potential to create precise virtual models of real ecosystems (to better observe and understand processes that accelerate climate change and conduct simulations to mitigate the scale of negative effects) and mitigate environmental pollution (by relocating certain real-world processes to virtual spaces). It is important to track the environmental costs of deployment to ensure advantages outweigh the carbon footprint produced by its use; and to develop metaverse-related technologies and energy-saving solutions in parallel. ○ ***"Top of mind" implications*** include 1) Economy: Potential to create new business opportunities and reshape industries; and 2) Society: New ways in which people can meaningfully engage in public and social life. With risks including addiction, cyberbullying, and sexual assault, it is essential to 1) Provide individuals with digital literacy training to navigate metaverse spaces safely for themselves and others; and 2) Continuously monitor the impact on mental and physical health. ○ ***Governance & policy implications***: In my view, the current situation in the field of AI offers insight into the potential challenges that may emerge when shaping regulations and policies for the metaverse. Specifically, there are calls for global cooperation, the formation of cross-sectoral advisory bodies, and substantial efforts by international organisations to conduct consultations and develop principles. Like AI, the metaverse will also be accompanied by challenges transcending national borders. It is, therefore, crucial to monitor these and act before metaverse challenges become as urgent as those connected with AI.

8 Methodology

To develop its historical observations, this document used data from desk and archival research to trace human migration deeper and deeper online through the Internet as it became widely available in the 1990s; blended with arcade, gaming consoles and computer hardware to usher in the "interactive era" in the mid-1990s; then made its way into a future where physical and digital spaces are increasingly converging into a blended reality [b-IFTF].

Illustrative implications (benefits and risks) for use in benchmarking and comparative analysis were derived from the above desk and archival research; and appears in the following:

1. Table 3: Metaverse implications: An illustration of SDO perspectives through FG-MV (in the third column under "Illustrative").
2. Table 4: Metaverse implications: An illustration of sector perspectives (in the second column under "Possible Considerations").

Present day observations were developed as follows:

- By analysing the following FG-MV approved Deliverables to extract perspectives on metaverse implications by WG and performing a comparative analysis with perspectives from desk research.
    - [b-ITU FGMV-06] Technical Report on "*Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse*" (WG6)
    - [b-ITU FGMV-08] Technical Report on "*Design criteria and technical requirements for sustainable metaverse ecosystems*" (WG8)
    - [b-ITU FGMV-10] Technical Report on "*Cyber risks, threats, and harms in the metaverse*" (WG6)
    - [b-ITU FGMV-13] Technical Report on "*Responsible Use of AI for Child Protection in the metaverse*" (WG6)
    - [b-ITU FGMV-14] Technical Report on "*Regulatory and Economic Aspects in the metaverse: Data Protection-Related*" (WG7)
    - [b-ITU FGMV-23] Technical Report on "*Considering online and offline implications in efforts to build confidence and security in the metaverse*" (WG6)
    - [b-ITU FGMV-25] Technical Report on "*Near-term and long-term implications for people in the metaverse*" (WG1)
- Through written and recorded individual interviews conducted with senior leaders in every sector and from all over the world to collect diverse perspectives and experiences. These interviews were then analysed against perspectives observed from desk research to create an overall analysis of joint perspectives from the field in Section 7. A high-level summary of each interview is also included in Table 5 of the same section. This document includes the comprehensive data relating to these interviews as follows:
    - Annex A: Implications Interview Concept Note (with interview protocol)
    - Annex B: Implications Interview Participants (detailed list of participants)
    - Annex C: Implications Interview Responses
        - Interviewees in each sector were selected for these interviews based on their level of engagement in emerging technologies, especially where they have pioneered sector-related activities in the metaverse.
        - Out of the 25 interviews conducted, 23 were conducted in writing and two were conducted via Microsoft Teams.
        - All interviews are included in Annex C as received, modified only for spelling, formatting, and procedural elements.

9 Conclusion

This Technical Report set out to explore the near-term and long-term implications for people in the metaverse by investigating the metaverse from the perspective of its potential as the future of the Internet through historical and present-day observations.

In its effort to complete that work, this report:

1. Contextualized the metaverse and its development in the historical context of the Internet through desk and archival research.

2. Collected present day perspectives and experiences as they relate to metaverse implications:
    a. Identified and analysed metaverse implications (through desk research) to develop illustrative considerations as perspectives from research and as baseline data for comparative analysis.
    b. Extracted WG-level perspectives for a pre-standardization view through an analysis of approved reports at ITU's FG-MV. Performed a comparative analysis with perspectives revealed through the above desk research.
    c. Conducted multisectoral interviews for a view from the field (public sector, private sector, and third sector) of senior leaders in regions across the world aimed at capturing working (current, active, and related to decision-making) perspectives of metaverse implications. Observed, analysed, and summarized these insights for high-level review.

As the metaverse is still in its nascent phase, and implications are not yet entirely clear, this Technical Report provides insights and analysis as an early roadmap to serve as a:

1. Framework for understanding its potential near-term and long-term implications, and
2. Guide to maximizing benefits and minimizing associated risks.

The report is meant to serve as a pre-standardization roadmap, providing baseline data that can evolve with the ongoing evolution of underlying technologies, platforms, and implications.

Annex A: Implications Interview Concept Note

Interviews on implications for people in the metaverse to be included in Technical Report on "Near-term and long-term implications for people in the metaverse"

1. Introduction

Working Group (WG) 1 Task Group (TG) on implications for people in the metaverse of the ITU-T Focus Group on metaverse (FG-MV) aims to explore the views of senior leaders as they relate to implications for people in the metaverse, through a series of multisector interviews across the world.

The FG-MV plans to publish the results of these interviews as well as the interviews themselves in the final version of the ITU-T Technical Report on "Near-term and long-term implications for people in the metaverse" (FGMV-I-155), which will be published in December 2023 on ITU's website.

We are grateful to those that are taking part in these important contributions to the work of FG-MV.

2. Background

The promise of a post-COVID-19 metaverse is rapid acceleration of an already super-charged global digital transformation with the potential to transform our lives, livelihoods, and interactions, both in the near-term and long-term.

By 2026, 25% of people will spend at least one hour a day in the metaverse (Gartner) and by 2030 the value of the metaverse could reach USD 5 trillion (McKinsey). The depth and breadth of this transformation cannot be overstated. Neither can our lack of clarity around the implications.

The Technical Report on "Near-term and long-term implications for people in the metaverse" seeks to explore these implications as a framework for understanding potential impacts and a guide for maximizing the benefits and minimizing associated risks.

3. Objective

The challenge of understanding implications for people in the metaverse is that the metaverse itself has not been in existence long enough to provide a great deal of historical data, and where that data does exist, use cases are fairly limited to gaming and entertainment.

The rationale for conducting individual interviews as part of this Technical Report is therefore to help overcome this challenge by gaining access to new and relevant perspectives from leaders who are shaping the future of the metaverse as a complement to the desk and archival research that has already been completed.

This is especially useful in capturing of-the-moment and on-the-ground information as well as that which we cannot observe: feelings, thoughts, and intentions. Understanding these three elements is valuable to contextualizing what it is we can observe.

4. Summary of Approach and Process

TG-implications for people in the metaverse plans to conduct about 50 interviews with senior leaders at government, academia, non-profit and private sector organizations from all over the world to collect diverse perspectives and experiences. Efforts will be made to ensure that perspectives collected also include a diverse age range including youth. Details as follows:

- All interviewees will be interviewed in writing, with 11 questions making up the interview. Responses will also be in writing and will be included in the Technical Report.

- In some cases, this may be followed by a brief recorded interview to further discuss written responses. The recorded interview will be composed of a maximum of two questions and last less than 10 to 15 minutes. The final video will be at most five minutes.
- Interviewees will have a chance to review and approve the video, which will be produced by ITU and stored on the ITU website as part of the final Technical Report. The videos will have the ITU logo, be publicly accessible, and will not be part of any promotion.
- For these interviews, senior leaders will be defined as those at or above the following levels:
    - Government: Minister or Deputy Minister | Head or Deputy Head of Regulatory or Technology Agency | Mayor or Deputy Mayor
    - United Nations: Secretary General or Deputy Secretary General
    - Private sector: Founder, CEO or CTO
    - Non-profit: Executive Director or Deputy Executive Director
    - Academia: Professor
    - Recognized next generation leaders.

5. Draft Interview Protocol

Still in its nascent phase, scholarly investigation relating to implications in the metaverse is often focused on its potential risks. Those that do focus on rewards paint a rosy and unbalanced picture.

These interviews of the senior-most level decision makers in all sectors of society, seek to offer a more nuanced understanding of potential near-term and long-term implications for people in the metaverse; with the goal of providing a useful resource to governments and organizations as they develop their future digital transformation plans.

5.1 Data

Data collected during these interviews will not be kept anonymous. Interviews will be published in the Technical Report on "Near-term and long-term implications for people in the metaverse" as indicated above or used in its development. The data will not be used for any other purpose. ITU will be the data recipient and will store it for a period of five years.

5.2 Consent

Your participation in this interview(s) is entirely voluntary. You have the option of ending your participation at any time. If you choose to end your participation, your data will be deleted from the study. You are also free to omit any question or withdraw your answers prior to publication.

5.3 Interview Questions (First Draft)

5.3.1 Part 1: Definition

a. When did you first hear the term "metaverse"?
b. What was your understanding of that term then versus now?
c. How would you compare the "metaverse" to the internet, social media, or any other communication tool?

5.3.2 Part 2: Relevance

d. How seriously do you take the metaverse? Is it just hype or will it change everything?
e. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.
f. How could any or all the above benefit from the metaverse? What are the risks?

5.3.3 Part 3: Implications

g. What concerns you most about the metaverse and how would you suggest mitigating these concerns?

h. What excites you most about the metaverse and how would you suggest maximizing these benefits?

i. What "metaverse implications" are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

j. Please share your opinions on at least one of the following:

   i. *Societal Transformation*: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

   ii. *Economic Outlook*: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?

   iii. *Governance and Policy*: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

   iv. *Technological Implications*: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?

   v. *Individual Empowerment*: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?

k. What is the most important question we DID NOT ask in this interview?

Once again, we thank you for your time.

Annex B: Implications Interview Participants

All Sectors	25 Participants
Public (or State) Sector	1. Mr Belal Al-Hafnawi, Commissioner and Member of the Board, Telecommunications Regulatory Commission (TRC), Jordan (Middle East) 2. Mr Carlos Manuel Baigorri, President, National Telecommunications Agency (ANATEL), Brazil (Americas) 3. Mr José de la Uz, Mayor, Las Rozas, Spain (Europe) 4. Mr Daniel Vega Díaz, Technical Secretary, Spanish Network of Smart Cities (RECI), Spain (Europe) 5. Mr Luis Nava Guerrero, Mayor, Querétaro, Mexico (Americas) 6. Ms Gema Igual, Mayor, Santander, Spain (Europe) 7. Ms Jung-Sook Park, Secretary-General, World Smart Sustainable Cities Organization (WeGO), Republic of Korea, (Asia) 8. Ms Malini Ramalingam, Head, Digital Demand Creation Department, Digital Ecosystem Development Division, Malaysia (Asia) 9. Mr Bartolomé Pujals Suárez, Director General, Government Office of Information and Communication Technologies (OGTIC), Dominican Republic (Americas)
Private (or Citizen) Sector	1. Mr Manuel Barreiro, Founder, Partner, and Chairman, Aston Group, Mexico (Americas) 2. Dr Ashraf Darwish, Professor of Computer Science, Faculty of Science, Helwan University, Cairo, Egypt (Middle East) 3. Mr Sébastien Devaud (Agoria), Co-founder, InFiné; Digital Artist, DJ, Composer and Music Producer, France (Europe) 4. Dr Alex Howland, President and Co-founder, Virbela, United States (Americas) 5. Dr Pilar Orero, Professor, Universitat Autònoma de Barcelona, Spain (Europe)
Third (or Non-profit) Sector *Includes Non-Governmental Organizations*	1. Ms Natalia Bayona, Executive Director, United Nations World Tourism Organization (UN WTO) 2. Dr David Bray, Co-Chair & Distinguished Fellow, Alfred Lee Loomis Innovation Council, Henry L. Stimson Center, United States (Americas) 3. Mr Noel Curran, Director General, European Broadcasting Union (Europe) 4. Dr Araba Sey, Deputy Director, Research ICT Africa, South Africa (Africa) 5. Mr Mounir Tabet, Deputy Executive Secretary, United Nations Economic and Social Commission for Western Asia (UN ESCWA) 6. Dr Jane Thomason, Emeritus Chair, World Metaverse Council, Slovenia (Europe) 7. Mr Neil Trevett, President & Chairman, Metaverse Standards Forum, United States (Americas)
Recognized next generation leaders *Multisector*	1. Ms Tayma Abdalhadi, Technologist, Gender Champion and GC-ARB Youth Envoy, Palestine (Middle East) 2. Ms Federica Morici, Founder, Estudiantes Digitales, Argentina (Americas) 3. Mr Ramu Pandey, President, Youth Council in Action for Nation (YOUTH CAN), Nepal (Asia) 4. Ms Emilia Zalewska-Czajczyńska, Co-founder, Youth IGF Poland, Poland (Europe)

Annex C: Implications Interview Responses

Sector	Participants
Public (or State) Sector Page Link	1. Mr Belal Al-Hafnawi | Link 2. Mr Carlos Manuel Baigorri | Link 3. Mr José de la Uz | Link 4. Mr Daniel Vega Díaz | Link 5. Mr Luis Nava Guerrero | Link 6. Ms Gema Igual | Link 7. Ms Jung-Sook Park | Link 8. Ms Malini Ramalingam | Link 9. Mr Bartolomé Pujals Suárez | Link
Private (or Citizen) Sector Page Link	1. Mr Manuel Barreiro | Link 2. Dr Ashraf Darwish | Link 3. Mr Sébastien Devaud (Agoria) | Link 4. Dr Alex Howland | Link 5. Dr Pilar Orero | Link
Third (or Non-profit) Sector *Includes Non-Governmental Organizations* Page Link	1. Ms Natalia Bayona | Link 2. Dr David Bray | Link 3. Mr Noel Curran | Link 4. Dr Araba Sey | Link 5. Mr Mounir Tabet | Link 6. Dr Jane Thomason | Link 7. Mr Neil Trevett | Link
Recognized next generation leaders *Multisector* Page Link	1. Ms Tayma Abdalhadi | Link 2. Ms Federica Morici | Link 3. Mr Ramu Pandey | Link 4. Ms Emilia Zalewska-Czajczyńska | Link

Written Interview Date
30 November 2023
Responses
Below as Received

Al-Hafnawi

Mr Belal Al-Hafnawi
Middle East (Jordan)
Public Sector (State Government)

Part 1: Definition	1. When did you first hear the term "metaverse"? Metaverse concept started in 2021 when Facebook renamed itself Meta. 2. What was your understanding of that term then versus now? The concept changed to use metaverse as a virtual world to represent the real world in digital virtual world, and Avatars will be used to represent human in the metaverse world. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? Metaverse is an advanced digital world, it uses all technologies to make a complete virtual world, so it will use internet and will have platform like social media but [at an] advanced level. It will also use emerging technologies like Blockchain, AR, VR, Artificial intelligence, cloud, and other technologies.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? Metaverse so far it is a hype stage, it [hasn't yet] disrupted business, as there are many limitations like technology limitation and platforms maturity. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. Still no real need for metaverse, but need will grow in the few coming years with the advancement of technology and 5G networks spreading. 6. How could any or all the above benefit from the metaverse? What are the risks? The benefit will be highlighted based on the use cases and relativity with real human needs, but it is expected to have future needs in different domains.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? There are many concerns about the metaverse, one important concern is mature system with resilient connectivity. Second concern is security of Metaverse systems. Third concern is data exchange and sharing between real world and virtual world. Another concern is ecosystem spreading among different countries. Also, the regulation and governance are another challenge for metaverse in different countries. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? Excitement is about using it in tourist, education, and government services. Maximizing the benefit could happen by starting with real use cases touching the customer needs.

	9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? Yes, metaverse will increase the use of internet; also, it will require high speed systems and infrastructure; it will enhance the spreading of 5G networks and emerging technologies in addition to fiber networks. 10. Please share your opinions on at least one of the following: i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development? It is very important to have an advanced telecommunication infrastructure to support the work for Metaverse, in that manner countries are working hard to develop their infrastructure by upgrading telecom network to 5G network to support high speed and low latency. International collaboration is important for the metaverse in two manners: o To have ecosystem for infrastructure supporting metaverse, because huge ecosystem will reduce the cost for having new technologies. o And collaboration is important to more users for metaverse platforms from different countries to represent people from all places in the world to simulate real world in the virtual world. 11. What is the most important question we DID NOT ask in this interview? o Did you try using metaverse systems? o Or are there metaverse platforms available in your country?

---------- Al-Hafnawi End ----------

Written Interview Date
30 November 2023
Responses
Below as Received

Baigorri

Mr Carlos Manuel Baigorri
Americas (Brazil)
Public Sector (State)

Part 1: Definition	1. When did you first hear the term "metaverse"? I likely first encountered the term by the end of 2021, through media coverage. 2. What was your understanding of that term then versus now? Since I first heard the term, numerous new possibilities for the technology have emerged across a wide range of fields and areas. At first, I did not anticipate such a diverse array of applications, and Metaverse appeared to be limited to virtual realities that enabled personal interactions through avatars in the digital space. In this sense, I believe the term has broadened its scope, extending to industries and uses initially out of reach. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The metaverse builds upon previous generations of the Internet, expanding the ways users can interact, enjoy themselves, and access information. In a sense, it can be seen as an organic evolution for telecom and digital platforms, from telephones to social networks. Although new devices and technologies continue to be developed to enable the metaverse, the fundamental principles of connectivity remain the same, as do most of the challenges that arise from it.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? The prospects for the public adoption of any new technology are uncertain, as there is no guarantee related to the technical advancements and functionalities embedded in it. In this sense, the most likely scenario would be somewhere between the extremes presented - either a mere hype or a digital revolution. Nevertheless, considering the potential future use cases will not be limited to gaming; instead, the metaverse functionalities will be adapted to a wide range of industries' needs, regulators must be flexible enough to support its development regardless the kind of application that will drive the metaverse in the future. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The metaverse may drive the demand for telecommunication services of an entire new generation of users. The connectivity layer will play an even more pivotal role in this context. Conversely, the telecommunication infrastructure supports and enables metaverse deployment. While the metaverse leverages network capabilities, it may also face constraints imposed by the telecom infrastructure limitations. In this regard, the development of both industries, metaverse and telecom, is intertwined, and must evolve synergistically to realize their full potential. 6. How could any or all the above benefit from the metaverse? What are the risks? If the network does not meet the occasional demand generated by the metaverse, network users may face severe potential connectivity issues, such as loss of packets and

	performance downgrades. In the long run, metaverse may drive significant investments in the sector to guarantee a smooth experience, benefiting the entire industry.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? My primary concern is that the widespread adoption of metaverse applications, including public services in cityverses [sic], may increase the existing digital divide, instead of minimizing it. The high prices of current devices necessary for accessing today's metaverse applications, such as augmented/virtual reality headsets, are prohibitive for most of the world's population, reinforcing this risk perspective. Unless the development of the metaverse is closely accompanied by an improvement in meaningful connectivity across all countries, it may alienate the most vulnerable individuals in our societies. Promoting competition, with the aim of reducing device prices and facilitating more affordable network accesses, appears to be a potential remedy for addressing the digital breach. Public policies aimed at universalizing meaningful connectivity will play a crucial role in the endeavor to prevent discrimination in access to the metaverse. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The new possibilities arising from the adoption of the metaverse, customized to the specific needs of a wide range of economic sectors in creative ways, that can revolutionize how long-established industries and habits work, across an incalculable spectrum of human fields. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? The current issues associated with the use of social networks, such as the spread of disinformation and challenges to human rights, can be amplified by the immersive nature of the metaverse. These implications are not only influenced by the raw percentage of Internet usage, but mainly by meaningfulness of this connectivity. One of the key aspects of connectivity is the level of digital skills required of users to enable a full and transformative experience in navigating the Internet. In this regard, in addition to network coverage, the quality of the available access is also, if not the most relevant, is a significant variable. 10. Please share your opinions on at least one of the following: i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development? The metaverse will require a profound transformation in the architecture of current networks, hastening the ongoing decentralization of information processing and storage. International collaboration must play a facilitating role in this process by establishing and promoting international standards for new equipment and devices, fostering scalability to reduce prices, and increasing investments. The positive outcome of such coordinated efforts results in more affordable access, allowing more people to take advantage of the new possibilities offered by the metaverse.

---------- Baigorri End ----------

Written Interview Date
13 November 2023
Responses
Below as Received

de la Uz

Mr José de la Uz
Europe (Spain)
Public Sector (City Government)

Part 1: Definition	1. When did you first hear the term "metaverse"? I have a passion for technology and try to keep abreast of new advances, especially when there is the likelihood of major repercussions on the society. So, I've been aware of talk about the metaverse for some time now, particularly in connection with famous video games like Second Life. Like everyone else (except for the most tech-savvy), I only started to really pay attention towards the end of 2021, when Mark Zuckerberg announced his vision of the metaverse as the next step in the evolution of the Internet, and his company Facebook renamed itself Meta and started working towards making it a reality. 2. What was your understanding of that term then versus now? At first, I associated it with virtual reality, of course. At that time, I thought its use would be limited to video games and educational applications. I have learned since that its possibilities are much vaster, and in combination with other technologies it could become an important part of everyday life. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? I would say it is one more communication channel, like the Internet in its early days. As with all new technologies, we don't yet know how it will evolve and whether it is here to stay. The smart thing to do is to start getting acquainted with it, observing how it evolves and getting prepared to employ it intelligently if the moment comes. Whether it becomes a mass phenomenon or not will depend on how useful it is for people, companies, and institutions, and how easy it is to use. The equipment you need to access the metaverse is still too cumbersome and expensive, and many people experience dizziness when they use it. Plus, it requires powerful computers and a high-speed connection, which not everyone has. We will see what happens as the technology gets refined, prices fall, and more applications and experiences get created for the metaverse, and it will become clear whether it really is the next step in the evolution of the Internet. I doubt that we'll all be walking around with VR goggles, oblivious to what is going on in the analogue world. Instead, I think that we'll turn to it for specific purposes throughout the day, whether it be for work, shopping, leisure and so on.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? If you listen to the believers, first and foremost Mark Zuckerberg, it's going to be a revolution. What's certain is that the possibility of interacting and performing a variety of everyday tasks within a virtual setting will open the door to a brand-new reality with new ways of working, learning, engaging in leisure activities, maybe even – who knows? – new ways of thinking. There may come a day where we'll have trouble remembering what life was like before, as happened with the Internet and mobile phones. So, our imagination is the limit, as far as the potential of the metaverse is concerned.

Personally, I take it very seriously and follow the evolution closely. I am thinking for example of a pilot project of Madrid's Hospital Universitario de la Princesa, the telecom operator Telefónica and tech company La Frontera VR which allows patients with multiple sclerosis to do rehabilitation in virtual exercise rooms without leaving their home, using VR goggles with 5G connectivity. The results are impressive.

Still, for now it has been more buzz than substance. When Zuckerberg changed the name from Facebook to Meta and announced that developing the metaverse was the big objective, many companies rushed to offer products and services for this new world. Unsurprisingly, most of them were far from mature, but companies felt compelled to move. There was the fear of missing out, and after all they were only following one of the biggest tech companies in the world. And then there are the opportunists, passing themselves off as experts on something that does not even exist yet.

With the dust starting to settle, companies are beginning to find their place in the metaverse, creating limited experiments that function as pilot projects. For example, numerous brands now have a virtual storefront. The best thing, as I said earlier, is to observe and prepare to move into action. In any event, experts say that quite a few years will be needed until a metaverse, or several metaverses, come into being along the lines envisioned by Zuckerberg. Recently I read a Gartner report that suggested 2030 as an optimistic horizon, and recommended investors to remain cautious in the short term.

5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.

It's too early to say. For my part, I would note that Las Rozas is a smart city which has made innovation and technology into crucial tools for improving the quality of life of inhabitants and for managing the work of the municipality. We are open to all new ideas and have a rich business and entrepreneurial ecosystem with a lot of start-ups (within the Madrid autonomous community, only the capital itself has more start-ups). Let there be no doubt: if the metaverse turns out to be a useful tool, we will make use of it. As a matter of fact, we are already looking at the use of digital twins in mobility to manage low-emissions zones.

6. How could any or all the above benefit from the metaverse? What are the risks?

That remains to be seen, as I have already indicated. But industry can be a big help. The Renault Group, for example, has launched its own industrial metaverse, with digital twins of the production lines of all its factories, which are connected and collect a billion data items every day. Thanks to big data, artificial intelligence and other technologies, the group's engineers can navigate within the metaverse and identify incidents in the virtual models that get missed in the factories. In this way they can correct or improve the production process in real time, helping to keep costs down.

I think it will have a major impact in education and health care, in addition to the video game and entertainment industry, of course. We in the public sector can't remain aloof from technological advances either because we have an obligation to keep up with the society we serve. And indeed, improvements are already being made in the public service, thanks to artificial intelligence, big data, and the Internet of Things. We need a more agile, less bureaucratic administration that is less remote from ordinary people. In Las Rozas we are already doing it. Thus, we have put almost 300 procedures online for the public. We have launched an AI-powered chatbot that knows the city and municipal organization better than anyone and is available 24/7 to answer requests for information. In the future, this interaction may take place in the metaverse.

I continue to follow with great interest an initiative of the city of Seoul, the Metaverse Seoul project, with an online multi-office environment that allows users to create

	personalized avatars and gain access to a variety of services. They are even looking at creating the possibility for inhabitants to combine virtual and augmented reality to interact with the urban infrastructure. This is technology being used to improve people's life, and that's what it's all about.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? The technology itself is neither good nor bad; everything depends on how it's used. The metaverse will confront us with new problems, but also many that we already know from the Internet. The things that worry me are cybercrime, data privacy and child protection. Criminals are losing no time in adopting the new technological tools; indeed, they tend to be one step ahead of legislators and the society. We need a big effort in terms of regulation and educating users to make sure the metaverse doesn't become a dangerous place. The virtual worlds will lead to the emergence of new ways of relating to one another and engaging in transactions. There are already many questions to be answered: how will we define harassment offences in the multiverse? What role will law enforcement play in this environment; how far will they be allowed to go? Should everything that is illegal in the real world be made illegal in the digital world? What sorts of behaviours that are inadmissible in the street might be allowed in a virtual setting? Many cybercrimes are international in nature; what does this imply for the sovereignty of the State, and organizations like the European Union? Are individuals responsible for what their avatar gets up to? In an immaterial setting, defining and sanctioning crimes is not a straightforward matter. We will have to be very vigilant about how young people use the metaverse. All the threats to which they are already exposed – addiction, mental pathologies, child abuse, child pornography and so on – could be exacerbated with virtual reality. It is vital to educate children from an early age and monitor the way they appropriate the new technologies for themselves. And of course, as mayor, I am concerned about data privacy. It is impossible to eliminate risk entirely, and municipal administrations handle sensitive information about our inhabitants. We are in the process of moving to data-based management, and data protection is an obligation. The metaverse will see new ways of interacting between inhabitants and the administration, and the data this will generate are highly attractive for criminals. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? My ideas about the metaverse are the same as my ideas about technology in general: it is a tool, and it makes sense only if it improves the people's lives. What I like about the metaverse – assuming it goes the way we are being told it will – is its promise of a new communication channel and new ways of learning and building prosperity. The best way to turn its potential into real benefits will be to use it responsibly, which requires a commitment and efforts to educate users, especially those most vulnerable. It's just like ITRW ("in the real world"): anything that isn't illegal, goes. Within those limits, people should be allowed to exercise their freedom without the state intruding and putting up barriers. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? Las Rozas has a young, highly educated population, which is completely at ease in the Internet. Within the municipality, 99 per cent have fibre-optic connections, and 5G is

	widely deployed. I have been mayor for over eight years, and one of the pillars of my administration has been to ensure that our city is one of the most innovative ones in Spain, a place where technology is used to improve the quality of life in a sustainable manner. This is why we set up Las Rozas Innova, a publicly owned company of the Municipality with the mission to connect the city's technological and innovative ecosystem, and to attract talent, entrepreneurs, and businesses. We are well positioned, I have no doubt that, if the metaverse takes off, the new tool will become part of everyday life for the citizens of Las Rozas. It is precisely because of the innovative character of the municipality that we closely follow all technological developments. And we will continue our policy, which is giving good results. We will ensure compliance with the regulatory framework, which, in the technology domain, does not depend on us. So, within these norms, our role as an administration is to facilitate and support private-sector activity, not create hindrances for individual and corporate initiatives. 10. Please share your opinions on at least one of the following: i. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens? The metaverse needs to be regulated, because there will always be people who use it with nefarious intentions and users will have to be protected, especially minors, disadvantaged individuals and those older persons who may be less tech-savvy. The European Union and its Member States, to whom we belong, already have a solid regulatory basis, particularly the recent Digital Services Act. I would re-emphasize that what is important here is to strike a balance between protection of the public and the development of tech tools that promise to increase prosperity for all. Finding that balance is not easy; the authorities need to adapt continuously to new realities, and the rules [need] to be updated constantly. But that's a price worth paying. Without a clear legal framework and legal certainty, we risk descending into chaos; this is particularly true in the tech domain, given its dizzying pace of change.

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Written Interview Date
29 November 2023
Responses
Below as Received

Díaz

Mr Daniel Vega Díaz
Europe (Spain)
Public Sector (City)

Part 1: Definition

1. When did you first hear the term “metaverse”?

I was confronted with the reality of the metaverse for the first time when I watched Steven Spielberg's adaptation of Ernest Cline’s novel *Ready Player One*, written in 2011. However, at that time it was like watching a science fiction movie like any other. Quite original, yes, but I did not imagine that Oasis, the imaginary world depicted in the film, could one day be something present in my day-to-day life. It was a world as far away from me as Star Wars or something in the same line of fiction. Years later, in 2021, Mark Zuckerberg changed the name Facebook to "Meta", expressing a new vision of the internet and his plan for the creation of a new metaverse. There I saw that Cline's idea was something more realistic than a utopian virtual universe, and that there were people investing a lot of time and money in making it a reality. Today I think we are still far from its real potential, but it is certainly not so far away.

2. What was your understanding of that term then versus now?

I conceived the metaverse as something utopian, or that at most it could have its market in the world of video games and in applications far removed from the real problems of people. In recent years I have closely followed its evolution and I see that it has a much greater potential with applications in education, health, mobility, or city government, so now I understand that the metaverse can be a reality. However, I think we are all a bit expectant about what will happen: defining a future concept like the metaverse in the present is difficult, and I think it will be defined as we learn more about it and see its applications.

However, some conclusions can already be drawn about the metaverse. It is not only a virtual reality, but it goes beyond that. To summarize what I understand by metaverse, I would say that there are four fundamental characteristics. The first is that it is persistent, that is, it never ends or restarts and is always there. In contrast, a multiplayer video game or a video call has a beginning and an end. Secondly, the scale is much larger than two-dimensional technologies, and it seems that it will be possible to have millions of participants interacting in the same virtual reality in perfect synchrony, although it is true that existing technology does not yet allow this. Accessibility is the third key point of the metaverse: it can be accessed from any device, at any time, and that it is also interoperable and can be passed from one experience to another with the same identity and digital assets. Finally, there could be a virtual economy with assets that can be carried from one side to the other and that are transferable between platforms and are personal, forming part of the same economic ecosystem.

In conclusion, when you do a little research about the metaverse, you can see that it is not simply a new way of entertainment, but that it can mean much more than that. That is why me, as the secretary of the Spanish Network of Smart Cities, I want to be permanently informed about everything that happens to see possible implications in our cities. In that sense, I always read and listen to the great experts in the field. I cannot fail to mention the great work ITU is doing in this regard. Their reports on the metaverse are valuable, both for their depth and their cross-cutting nature. The Focus Group on the metaverse approaches the subject from nine different perspectives, including applications and services, data protection and security, aspects of regulation, economics and competition, and inclusion, accessibility, and sustainability.

	3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The metaverse shares many features with the beginnings of any emerging technology: significant economic investment, high social expectations, and uncertainty about its potential. When comparing the metaverse with the evolution of other technologies, such as the first cell phones, we observe an exponential progression. Initially, phones only allowed calls to be made, then functions such as music playback and Internet browsing were incorporated, and today we have multifunctional devices that support a wide variety of applications. Similarly, the metaverse is in its early stages of development, offering vast potential, but still at an embryonic stage: we do not yet have sufficient technology, it is very expensive, the glasses are uncomfortable to wear for a long time, etc. Historically, technological disruptions have been linked to brilliant minds such as the Wright brothers, Nikola Tesla, Steve Jobs, or Elon Musk, who have led paradigm shifts. Understanding the metaverse requires recognizing its historical context and the influence of previous technologies, such as 5G, Internet of Things, virtual reality, augmented reality, and artificial intelligence. These technologies have paved the way for the implementation of the metaverse: Graham Bell invented the telephone heavily influenced by the knowledge and advances in electricity of the time. That said, the metaverse points to a new paradigm shift, as it is a real and persistent digital universe that represents a new step in the development of 3D technology, which is taking its first steps with virtual and augmented reality. We do not know how far it will go, but we are beginning to discover its potential impact, and like any technology, if used correctly, the impact can be very positive.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I take it very seriously, but I am cautious. To say today that the metaverse is already a paradigm shift on par with the great technological disruptions of history is somewhat daring. But it is true that there is a process that is taking place and that we must follow closely. I believe that we are not yet at the point where we can talk about the metaverse as an implemented reality such as the Internet, cell phones or artificial intelligence, which we are still discovering but which is already well established and has many applications. The technology required for the metaverse is not fully developed, its applications are still very limited, and the interaction is a bit "clumsy" and not very user-friendly. In addition, as is logical, most citizens are completely unaware of its potential. So, I think it is too early to say that the metaverse will change everything. Even so, there are very strong indications about the potential of the metaverse. As secretary of the Spanish Network of Smart Cities, I believe that there are many applications that could improve the quality of cities. There are already some specific examples of cities that are implementing this technology. For example, New Rochelle, in the state of New York, has created a platform called New Rochelle Virtual Reality (NRVR), through which citizens can experience through 360º views about 3 million square meters of urban improvements and developments and give their opinion on the proposals before they are implemented. Some days ago, I saw an interview with Irene Cano, Meta's general manager in Spain and Portugal, and when asked about what new steps could be taken, she talked about sensory experience and how to develop new devices that allow, for example, touch to be experienced remotely. Little by little, the movie *Ready Player One* shows that reality can surpass fiction. Still, I think we need to be cautious, and know that not everything that glitters is gold. You must take it seriously but considering that we are still in the early stages. As far as

	the network I represent is concerned, we must be cautious when implementing projects in the metaverse that require a large economic investment. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The Spanish Network of Smart Cities believes that the metaverse can play a key role in its mission to promote and foster technological innovation in cities to improve the quality of life of citizens. I am excited about the potential of the metaverse to contribute to the objectives of the organization. I see the metaverse as a great opportunity to boost the economy, improve the quality of life of inhabitants, promote well-being, strengthen public health, optimize governance, and preserve the environment. In that sense, any technology that generates positive impacts in these aspects will be welcome to RECI and we will work to implement it. From the perspective of smart cities, the metaverse offers several benefits. First, it can facilitate better interconnection and collaboration among the cities that are part of the network through more effective virtual interaction. RECI is composed of 144 municipalities, and it is sometimes difficult to have efficient coordination. The ability to network more efficiently can enhance synergy between cities when sharing good experiences or working in joint groups. In addition, the metaverse provides tools to simulate real environments, such as the construction of buildings using digital twins. This simulation allows for more informed and accurate decisions in urban planning and infrastructure development, which can lead to more sustainable growth of cities. At RECI, a working group is currently working on the development of an implementation guide for a concrete application of digital twins, which is the Building Information Modeling (BIM) technology, which could eventually be transferred to the reality of the metaverse. Another relevant aspect is the opening of new business horizons through virtual marketplaces, which provide additional economic opportunities and can stimulate creativity and innovation in the development of services and products related to the metaverse. As secretary of RECI I consider the metaverse to be a key tool with a potential to positively transform the way cities address challenges. That is why we have decided to include it as a working theme for our 2024 - 2029 strategy within Working Group 3: Digitalization and New Technologies. 6. How could any or all the above benefit from the metaverse? What are the risks? [See response to question 5.]
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? The metaverse raises concerns that need to be addressed to ensure its effective and ethical integration into smart urban environments. One of my biggest concerns is the regulation of citizens' behaviors in the metaverse, as in some ways their actions will not be as visible as in real life. It is important to be clear about what responsibilities citizens will have and how far the public administration can go to control users' actions. It is important to have a standardization to face this kind of challenges and, as we have commented before, to make it an interoperable reality so that there are few administrative barriers. On a more anthropological level, it is essential that as a society we ask ourselves why a metaverse exists. If its existence is geared towards better connectivity, to give us a greater sense of community and to help each other, I buy it. On the other hand, if the metaverse comes to be a kind of escape from a reality that we do not like and we are

trying to create an "ideal world" that solves all our problems, besides being utopian, it seems to me that it is not going anywhere. We must reflect on the ethical implications of its use so that it can serve as a good medium. It is possibly the same reflection we made with the arrival of the Internet or the cell phone: it all depends on whether we put it to good use or not.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?

What excites me most about the metaverse are the practical applications it can have. I mentioned several examples earlier, but the fact that it can improve so many areas of people's lives such as health, mobility, the relationship between public administration and citizens, the scope of our social interactions or technology itself is exciting.

To maximize these benefits, it is essential to address two crucial aspects: first, communication and empathy with citizens play a central role. Significant effort must be devoted to educating and raising awareness of the opportunities offered by the metaverse. This is especially important for those who are not digital natives, so that they can also benefit fully from the possibilities offered by this technology.

Secondly, network collaboration is essential, and this is something that RECI has been doing since its foundation. We have always recognized the importance of working collaboratively, and in the context of the metaverse this approach is even more relevant. Acting in a network implies recognizing that we are not alone in the implementation of projects and that benefits can be achieved by adding value to the different agents participating in the network.

I would like to emphasize that for RECI the emergence of the metaverse is exciting, and we will allocate resources for our partners to study possible applications for their cities in a collaborative manner.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

In Spain the use of Internet is totally generalized and is increasing if possible. We are talking about a society that is mostly very familiar with new technologies and it is possible that if the metaverse is spreading, there will also be an important permeability in our population. In the networked development of smart cities, I think the implications could be summarized in that there will be better connectivity and better teamwork when it comes to generating new innovative solutions for cities.

For example, consider the case of a city developing a low-emission zone strategy. It is possible that a digital twin could be created and adapted to the circumstances of any other city to see if it would be feasible and what the consequences of such a policy would be elsewhere.

On the other hand, of course, it may also involve a major cultural change that is already taking place. In just a few years we have moved from an analog society to a digital society, and we are on our way to living in a new virtual era. As I said before, the most important thing is that technology is used to improve the lives of citizens and used as a tool for the common good.

10. Please share your opinions on at least one of the following:
    i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?

    As we have mentioned before, the metaverse is in an embryonic stage, and it can be compared to when mobile phones took their first steps as much larger and heavier devices, and we could "only" make calls with them. Current virtual glasses

	have a very limited resolution and are far from the "retinal" resolution Mark Zuckerberg, for example, talks about. Another aspect is network latency or the realism of graphics. Regarding applications, we are still far from an extended "virtual economic ecosystem" where we have personal and transferable digital assets across different platforms. However, in Spain, we are prepared for the upcoming challenges as we have a very robust telecommunications network. Additionally, Spain's strategic digital plan for 2025 includes the total deployment of 5G technology to reach every corner of the country. I believe that international collaborations are necessary to network and progress more efficiently, rather than having involved parties act in isolation. Not only for economic reasons is it worthwhile to undertake joint projects, but it will also be much more efficient. In this regard, collaboration with institutions like ITU is essential because they serve as a reference for us. We recently had Radia Funna, a member of the Metaverse Focus Group, as the moderator of a roundtable on Enabling Technologies at the III RECI Congress held last October in Las Rozas de Madrid. Her knowledge on the subject inspired attendees, and we also hope to continue collaborating closely in the future with our Working Group on Digitization and New Technologies, where we will also address the topic of the metaverse. 11. What is the most important question we DID NOT ask in this interview? A futuristic reflection question could be included about an estimate of the year in which it is believed that all local entities would have a metaverse project in production, and whether, at that point, we anticipate the emergence of other new disruptive technologies.

---------- Díaz End ----------

Written Interview Dates
22 November 2023
8 December 2023
Responses
Below as Received

Guerrero

Mr Luis Nava Guerrero
Americas (Mexico)
Public Sector (City)

Part 1: Definition	1. When did you first hear the term "metaverse"? Maybe it was about 10 years ago, not in a specialized area, but in public opinion, what people say, what you hear around. 2. What was your understanding of that term then versus now? I think the change had to do with the concept of perception, interaction, and experience. At first, I thought about the metaverse just in terms of a more precise kind of digital universe, not so different in qualitative terms. It was, for me, just a way to interact more, not so much to interact different. Now I see it as a new universe, with qualitative differences in terms of the user experience, the perception you can reach, the kind of interaction you can have. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? Precisely, the difference has to do with the qualitative change in the experience: with the metaverse, it is easier to see that with internet, social media, or other communication tools we are just sharing and receiving data, while with the metaverse we are really interacting with people, perceiving even sensorial perceptions.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I think it has the potential to change a lot in the way we interact with each other, [as well as] to change social, political, cultural, and economic life in ways that we cannot yet anticipate. It will change things just as internet and social media changed things, and we must consider its potential, its risks, and advantages, for the metaverse to have a positive impact in society. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The metaverse is important both as an opportunity to participate in the development of products for it, as well as in its use in creating better living conditions for the populations from the municipal government. That's why we are fostering new projects and entrepreneurships in the area because we know it is a new market for the forthcoming future, that we must take advantage of, and do it in a way that helps us close social and economic gaps. We also are aware that we can explore different applications of the multiverse for the design and implementation of public policies, as it can bridge the experiences of the population with public institutions and vice versa, fostering better communication. 6. How could any or all the above benefit from the metaverse? What are the risks? [See response to question 5.]
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns?

I think, as with the internet, but more dangerous because of the quality of the experience, there is a risk of breaking social ties in the real world, and instead of being a tool for life it becomes life itself.

Also as with the internet, the multiverse could be a space for crime, even for organized crime.

To prevent that, we must promote better practices and make people conscious of the implications of the multiverse. The law enforcement institutions, as well as legislation, must anticipate the risks to prevent what happened with internet, where crime always appears to be one step ahead.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?
   The possibility to enhance communication between people and experiences; I think its benefits could be maximized mainly in education, because it could make accessible a lot of content and facilitate learning through experience at all levels and areas of education, closing gaps that currently are lived in our society.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?
   I'm interested in the implications on education and economy. I think that well used, metaverse can be a tool for closing gaps, gaps that internet have not been able to close, mostly because of the difficult accessibility to the necessary technology. That's why, to take advantage of such implications, and for them not to become a factor of inequality instead of equality, we must work in the accessibility of technology and guidance in its use.

10. Please share your opinions on at least one of the following:
    i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

       Metaverse gives people the opportunity to interact with each other in ways never imagined before, and to create both a new reality as well as new cultural products inside such realities, creating then a whole new spectrum of communication, languages, creativity, and culture in general. We need to have in mind, however, that there is material technology that determines access to the metaverse, and capacities to participate as a developer or user inside the metaverse. This implies the possibility of social, technological, and educational gaps excluding people from what the metaverse has to offer. So, bridging such gaps, we can detonate all the potentiality of the metaverse in the reality of social interaction.

    ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?
       There are two main dimensions where we can see the impact of metaverse in economy: first, there is the use of the metaverse in the already installed industry and markets, in terms of how much more efficient it can make existing processes, considering its cost and benefits, and on the other [hand], how the metaverse creates a whole new market new products, experiences and companies. If we identify its benefits and the possibilities it opens, the metaverse becomes both a tool and space for entrepreneurship and employment, bolstering new businesses, helping others to grow, and creating jobs.

       In that context, the metaverse has a two-dimensional relationship with education: on the one side, education must be a tool to promote the advantages of the

metaverse, so we must close gaps, so everybody has access to such capacities and formation. On the other side, is the use of the metaverse as a space and tool for education, in which it opens a whole new realm of opportunities, a lot yet to be explored, also with a social dimension, because it may be a tool for geographically and economically inclusive strategies.

iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
I think the first concern has to do with information, both personal information and government information. What has yet to be researched and regulated is how to protect private information and information that can be sensitive for governments or companies and that may be accessible through new forms of hacking in the metaverse. As it was with the internet, with every new technology always comes new ways of using it [nefariously], so we must be one step ahead and make the proper regulations.

iv. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?
As I said, the use of the metaverse, and everything that can be reached with it, in it, and through it, depends, [for] now at least, on material technology, infrastructure and equipment that must be accessible to all if we want the benefits to be inclusive and not an element of further inequality. I think it is important that international cooperation is established to provide resources to developing countries, so this technology is accessible. It can become an important and not that expensive tool to also foster the Sustainable Development Goals in new ways.

v. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
I think metaverse opens a new area of opportunities to access knowledge, establish new relations and dialogues around the world, and explore new ways of life. In that sense, the metaverse gives a lot of opportunities for personal development, for enrichment of the personal world, access to information and opportunities, establish social relations with people around the world with whom he or she shares common interests and discover new ones and grow together. However, there is the other side of the coin, as it has being with the internet, there is the risk that this kind of personal self-satisfaction, this world that is the metaverse where a person can find almost anything he wants and likes, ends up becoming an addiction, or, in building in its tools a profile of who he or she wants to be, acquires a false identity and in some cases gets “trapped”, to put it in a word, in that “perfect” world that can be the multiverse.

---------- Guerrero End ----------

Igual

Ms Gema Igual
Europe (Spain)
Public Sector (City Government)

Part 1: Definition	1. When did you first hear the term “metaverse”? Although the term metaverse is not new and there are previous references to that term in the literature, it was from 2021 when it became more popular coinciding with the change of Facebook corporate identity to Meta. Since then, it is when I started hearing about the metaverse more frequently. 2. What was your understanding of that term then versus now? At the beginning, for me the metaverse was an ethereal concept that was still in development rather than a reality available on the market. However, nowadays, although it is not a concept that all people are familiar with, the developments made by different companies that are public and are already available, are helping us understand the virtual worlds created in the metaverse and the potential use that they may have in the future of our cities. 3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The "metaverse" represents an evolution of the internet and social media platforms, providing users with additional opportunities for interaction and entertainment. While internet is a global system of interconnected computer networks that allow users to access and share information, communicate with others, and participate in digital activities, social media platforms [allow people] to connect [with other] people and share contents such us photos, posts, and messages among them. The metaverse goes beyond internet, social media, or any other communication tool we can consider, providing a fully immersive experience by creating virtual worlds where users can express themselves through avatars and interact in real time within the digital space with other users, integrating recognizable elements with virtual and augmented reality technologies.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? It is premature to affirm if the metaverse is just hype or will change everything, impacting in different aspects of our lives and transforming the way we study, learn, work, interact, distract ourselves and develop our business. If we analyze the different initiatives that promised to transform the world, they rarely materialized because [of] the difficulties to scale them up. However, although the metaverse is still in early stages of development, Santander innovation department is exploring the metaverse opportunities with a balanced perspective, considering not only its immense potential but also the potential risks, challenges, and limitations that we will face if we adopt this technology. Considering also that it is continuously evolving and will take several times to be more mature, we need to pay attention to its evolution and the works carried out on this matter. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.

	While in the private sector different efforts have been made in building the metaverse concept, at the city level we are starting to engage and analyze this technology. As city mayor, responsible for the general welfare of the city, we have an exciting opportunity to play an important role in how the metaverse comes to be for both residents and visitors. It is very important that in this early stage we understand how we can engage with citizens and what the future of our city government might look like with metaverse technology. Santander is elaborating a plan to develop the metaverse concept, exploring its potential usage in different areas (tourism, urban planning, retail, culture, arts, education, city services, etc.) and analyzing its implications from different perspectives. Considering that the combination of metaverse with digital twins will contribute to make smarter, more inclusive, and sustainable cities, the collaboration between the different stakeholders involved within this ecosystem will be crucial to maximize their benefits and to ensure that everything is aligned with the city strategy and community needs. Apart from that, sharing experiences with other cities and administrations developing similar experiences will help us to establish synergies and learn about best practices implemented by others. 6. How could any or all the above benefit from the metaverse? What are the risks? Metaverse has a lot of potential in the future development of the cities. Integrating the metaverse into tourism destinations like Santander can help us to enhance visitors' experiences and reshape the tourism industry by offering immersive and interactive experiences for visitors. Metaverse can help us to empower destination awareness, positioning, and branding, as well as improving its coordination and management. Applications like virtual tours, augmented reality guides, virtual reality experiences, interactive cultural experiences, recommendations, promotion of sustainable tourism, among others, are some examples that we can benefit to reach these goals and attract more visitors to our city. However, within this process, it is very important that we balance the virtual world with the real experiences in the physical world to enhance visitors' experiences, fostering the innovation and creating more inclusive and accessible services. Ethical concerns, privacy and data security, economic disruption with the traditional business, digital divide and accessibility are some of the risks we need to mitigate when working with the metaverse. Careful planning and establishing clear regulations, standards and guidelines will be crucial to mitigating these risks and ensuring we are implementing a responsible and sustainable metaverse.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? One of the main concerns when talking about the metaverse is the potential impact on privacy and security issues. Implementing data protection techniques, adhering to data protection regulations, giving users clear information about the data collected and how it will be used within the metaverse, promoting transparency and accountability, increasing the capacity of users and [their] awareness of these concerns, establishing ethical guidelines for the use of identities within the metaverse, are some of the measures that can be implemented to mitigate these concerns. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The benefits of the metaverse are numerous, as it has the potential to impact in our lives, transforming the manner we interact with technology and other individuals.

Metaverse will [allow us] to reshape many areas within the smart city paradigm, including urban planning, energy management, mobility, logistics, tourism, retail, arts and culture, entertainment, education, among others. Additionally, the metaverse and its underlying technologies also offer opportunities for local entrepreneurs to identify and develop new business models, by expanding the digital capabilities of the city, creating new experiences, and enhancing the quality of life of both citizens and visitors.

As decision makers, to maximize the metaverse benefits we should foster innovation within our cities, collaborating with the different stakeholders and working towards a shared vision of the metaverse, being responsible and respecting ethical considerations that may arise.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

The metaverse might increase urban inequalities and the digital divide dimension within cities. Privacy and security issues, social impact, ethical considerations, and responsible use of metaverse are also some of the 'metaverse implications' that we need to consider when talking about the metaverse. Apart from that, both regulation and standardization will also play [an] important role in shaping the metaverse concept for the near future.

Regarding the second question, it is important to note that the existence of broadband networks to facilitate access to the internet influences the existence of a digital divide in regions and, therefore, to metaverse accessibility. Collaboration between different stakeholders will be needed to improve existing internet infrastructures, promote digital inclusion initiatives and [provide] access to metaverse technology in an affordable manner [that] will help to solve [this] problem.

10. Please share your opinions on at least one of the following:
    i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

    The metaverse offers a lot of possibilities to reshape human interaction, communication, and cultural exchange, as it provides immersive and interactive virtual environments where individuals can participate, socialize, and engage in different activities. By means of the metaverse, we can redefine the way we interact with others and create innovative communication tools that go beyond the traditional tools by using virtual and augmented reality.

    When working within this societal transformation, we have the opportunity and responsibility to shape the metaverse as an inclusive space where everyone feels represented. It is also essential that within this process we address other challenges like privacy, and ethical considerations to create a responsible and sustainable metaverse.

    ii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

    Regulatory and policy frameworks are necessary to ensure responsible development, implementation, and usage of the metaverse. Global leaders should collaborate to create these frameworks, elaborating regulations and developing interoperability standards that allow communication and interaction between the different metaverse platforms available in the market.

    This will help also to promote open innovation and to prevent the creation of fragmented metaverse experiences in different areas.

	11. What is the most important question we DID NOT ask in this interview? There are a lot of important questions you have asked within this questionnaire. Maybe, when talking about the citizen centric approach of the metaverse, we would need to answer, “How should public administrations and governments join forces to address the metaverse in the future?”

---------- Igual End ----------

Written Interview Date
23 November 2023
Responses
Below as Received

Park

Ms Jung-Sook Park
Asia (Republic of Korea)
Public Sector (City Government)

Part 1: Definition	1. When did you first hear the term “metaverse”? As the Secretary-General of the World Smart Sustainable Cities Organization (WeGO), I have become familiar with the term "metaverse" when Seoul, the President City of WeGO, was developing its Metaverse platform for virtual municipal administration in 2021. The term “metaverse” is a composite of the English words "meta," meaning virtual or transcendental, and "universe," denoting space. 2. What was your understanding of that term then versus now? Both then and now, I understood “metaverse” as a realm where virtual and reality converge, creating a world where numerous individuals and entities interact, generating economic, social, and cultural values. I firmly believe that the metaverse, as a space, will evolve beyond the cyber realm, becoming a promising domain for the future of life. 3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The metaverse is commonly visualized as a virtual space with a three-dimensional representation, although it can be conceived in two dimensions. Unlike the internet and social media, which predominantly facilitate communication through text, images, and videos in a two-dimensional format, the metaverse sets itself apart by operating within a three-dimensional space. Within this environment, individuals employ digital twins as representations of themselves, participating in communication and engaging with virtual objects. Noteworthy is the metaverse's capacity to enable experiences that may be unattainable in reality, using avatars. As an example, in Metaverse Seoul, a novel service named the "Citizen Safety Experience Center" is slated to be launched at the end of this year. This service will allow users to undergo simulations on handling uncommon disaster situations. The metaverse's strength lies in its capability to provide immersive services that prove challenging through traditional web or app platforms.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? The metaverse, having recently emerged as a communication channel, presently exhibits usability challenges compared to two-dimensional web pages or app services, primarily due to the requirement for significant pre-downloaded resources. Nevertheless, there is an optimistic outlook that the accelerating speed of the internet and enhancements in download speeds will facilitate the activation of services that were previously challenging to deliver on conventional web or app platforms, achieved through adept utilization of digital twins’ features. Through diverse experiences in various aspects of our lives and previously unattainable encounters facilitated by web 2.0, we anticipate the exploration of new life networking and services. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.

	The activation of the metaverse is considered paramount as it offers unparalleled experiences to its users through immersive content within a three-dimensional space, a feature that is absent in services provided by traditional web or app platforms. 6. How could any or all the above benefit from the metaverse? What are the risks? Particularly within the metaverse, the utilization of digital twins empowers individuals to engage in experiences that are unattainable (in reality). An illustrative example is the upcoming introduction of the "Citizen Safety Experience Center" service in Metaverse Seoul by the end of 2023, providing a platform to navigate through disaster scenarios seldom encountered in real life. The metaverse's strength lies in its ability to deliver immersive services that pose challenges to conventional web or app platforms. The metaverse, as a visualized tool, holds the potential to (intuitively and sensibly) address the digital divide, surpassing text-centric web and app-based services. While acknowledging concerns and expressions of caution regarding potential new challenges, within the metaverse domain, distinctive offerings exclusive to public services are discernible. Consequently, WeGO, along with its member cities, are committed to the continued pursuit of initiatives in this field. However, it is crucial to ensure the credibility of the digital twins for sustained and practical innovation. Social trust is paramount for the perpetuation of this new technological advancement, necessitating consensus on protocols and ethics.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? While the benefits of the metaverse are apparent, it is crucial to recognize associated concerns. One such concern involves the potential emergence of social issues within the virtual space. For instance, users may, due to the virtual nature of the environment, become desensitized to the discomfort caused by interactions with or following another user's digital twin. Active participation of smart citizens is imperative to cultivate a technologically secure digital environment. In a proactive response to these challenges, Metaverse Seoul, for instance, has implemented the 'Metaverse Seoul Code of Ethics.' This initiative aims to clearly define the boundaries between reality and the virtual space, intending to establish ethical standards within the virtual realm. The overarching goal is to address potential discomfort and cultivate a responsible and considerate virtual community. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The metaverse captivates with its capacity for individuals to exert influence in the virtual realm through digital twins, all without repercussions in the real world. The upcoming 'Citizen Safety Experience Center' service in Metaverse Seoul, as previously highlighted, presents an opportunity to navigate scenarios that are challenging to encounter (in reality). Through virtual experiences of genuine disasters, individuals can fortify their preparedness and composure in the face of actual emergencies. The success of the metaverse requires citizens' engagement and direct contributions, a dynamism already proven by the social media of web 2.0. The public sector should adhere to fundamental principles, creating spaces while allowing users to generate content. With organic interaction between needs and rationality, it can solidify its position as a beneficial new tool for smart cities. To optimize these experiences, technological progress is essential. Enhancements in internet speed, facilitating swifter downloads of three-dimensional resources employed in virtual spaces, and advancements in graphic technology to adeptly represent three dimensional resources with minimal data capacity will be pivotal avenues for further

development.

9. What ‘metaverse implications’ are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?
   With the aim of enabling users to experience elements that are challenging to encounter (in reality) and acknowledging the significance of introducing three dimensional content to capitalize on the benefits of virtual space, Seoul is contemplating the widespread adoption of metaverse services accessible through smartphones at any time and from any location.

   While South Korea, particularly Seoul, features a well-established network of free public Wi-Fi and privately offered complimentary Wi-Fi, allowing internet access at any time and place, an enhancement in internet speed will be pivotal for the further activation of services utilizing the metaverse.

   In anticipation of an increased utility of the metaverse facilitated by advancements in three-dimensional graphic implementation technology and corresponding improvements in internet speed, an elevated integration of metaverse services can be predicted.

10. Please share your opinions on at least one of the following:
    i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?
       I hold the view that it is essential for each virtual space within the metaverse to eventually establish an integrated network. Presently, there exists an absence of clearly defined standards for interconnecting virtual spaces. Nevertheless, envisioning a scenario where international stakeholders collaborate in a manner like the establishment of existing internet standards, and subsequently propose a standard for the metaverse, leads to the conceivable notion that the metaverse could experience growth comparable to the evolution of the internet.

---------- Park End ----------

Written Interview Date
23 November 2023
Responses
Below as Received

Ramalingam

Ms Malini Ramalingam
Asia (Malaysia)
Public Sector (State Government)

Part 1: Definition	1. When did you first hear the term "metaverse"? I discovered the concept in 2020, where the conversations on AI, AR/VR, blockchain, 5G and alike were picking up. 2. What was your understanding of that term then versus now? The understanding on the implications, benefits, and challenges are wider and deeper now compared to then. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The metaverse represents a convergence of various technologies and concepts, including virtual reality, augmented reality, blockchain etc. It is distinct from other communication tools in its emphasis on immersion, interactivity, and the creation of persistent digital environments. However, it is still in the early stages of development, and its full potential and impact are yet to be determined.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? As regulators, we recognize the potential of the metaverse to impact society as well as the economy. We participate actively with ecosystem players, including technology companies and experts, to better understand the challenges and opportunities posed by the metaverse and to develop appropriate policies and regulations. Among the recent global engagement that we participated [in] was at ITU Focus Group on metaverse (FG-MV). The approach to regulation may vary from country to country, and it is an evolving area of focus as the metaverse continues to develop. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The metaverse is increasingly relevant to telecommunications regulators as it intersects with issues related to network infrastructure, digital inclusion, data privacy, content regulation, and many other regulatory aspects. Regulators are likely to play a crucial role in shaping the regulatory framework for the metaverse as it continues to evolve. 6. How could any or all the above benefit from the metaverse? What are the risks? Speaking from the regulator's point of view, it's important for regulators to proactively engage and understand the potential benefits and challenges of the metaverse. This will allow us to shape a regulatory framework that fosters responsible growth and innovation while ensuring the interests of society are safeguarded. Metaverse may contribute to many opportunities including economic growth, innovation and technological advancements, job creation, global collaboration, digital inclusion, and enhanced regulatory enforcement.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns?

	The metaverse, like any emerging technology, comes with various risks and challenges that regulators and stakeholders should consider. To mitigate these concerns, it is important to actively conduct engagements with value chain partners domestically, regionally, and internationally, to raise awareness on the benefits, risks as well as challenges. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The capability for the metaverse to transform the way we work, play, learn, and interact, offering a new dimension of possibilities and experiences. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? The metaverse landscape is evolving rapidly, and new implications may gain prominence from time to time. Staying informed about the latest developments and concerns is essential. However, the top 3 significant concerns could be privacy and data security, content regulation and moderation as well as regulatory frameworks development. The level of internet penetration in a region plays a huge role as it shapes the metaverse's accessibility, the readiness of its population, and the regulatory environment. It influences who can participate and how they engage with the metaverse. Navigating the implications of the metaverse may involve a thoughtful and multi-faceted approach. It requires a combination of responsible governance, technological innovation, public awareness, and a commitment to ensuring that the metaverse benefits all members of society. This is a dynamic and evolving space, so adaptability and continuous assessment of implications are crucial. 10. Please share your opinions on at least one of the following: i. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens? Creating these regulatory and policy frameworks will require collaboration between governments, industry stakeholders, technology companies, and the global community to ensure the metaverse remains a safe, innovative, and inclusive space while respecting the principles of privacy, security, and individual rights. A combination of international cooperation, multilateral agreements, and best practices can be used to strike a balance between encouraging metaverse innovation and safeguarding the rights, privacy, and safety of citizens. The collaborative efforts of nations can help create a more predictable and responsible metaverse environment that benefits all users and promotes global digital harmony.

---------- Ramalingam End ----------

Written Interview Date
18 December 2023
Responses
Below as Received

Suárez

Mr Bartolomé Pujals Suárez,
Americas (Dominican Republic)
Public Sector (State Government)

Part 1: Definition	1. When did you first hear the term "metaverse"? I first heard of the term "Metaverse" in 2020. Here it referred to the virtual space created by projects which aimed to create 3D virtual worlds. 2. What was your understanding of that term then versus now? My understanding of the term has evolved since then, at first it seemed to be a novelty rather than a possible disruptive technology. However, my understanding has evolved now, since besides just being virtual spaces the term now to me includes that the Metaverse has become a new form of collaboration between people, bridging the gap between the physical and the digital worlds. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The metaverse, in contrast to the internet, social media, and conventional communication tools, represents an evolution towards immersive, interconnected virtual experiences. For example, while the internet serves as a global information network, the metaverse expands on this concept by integrating three-dimensional virtual spaces, blurring the boundaries between physical and virtual realities. Social media platforms offer online interaction, but the metaverse takes social engagement to a new level, providing immersive environments where users can communicate in an audiovisual manner with realistic avatars. And unlike traditional communication tools, the metaverse fosters dynamic and natural interactions within virtual spaces, often incorporating virtual reality and augmented reality technologies to provide an enhanced experience.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I don't see it merely as a trend; rather, I believe it has the potential to fundamentally transform how we interact, work, and relate to one another. The influence of the metaverse could extend beyond current trends and have a lasting impact on society and the way we conceive digital reality. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. In the context of innovation in the public sector in the Dominican Republic and the Caribbean, the metaverse could be essential for driving new forms of collaboration, citizen engagement, and digital services. Creating virtual experiences centered on citizenship could strengthen the relationship between the government and citizens. Nationally, the metaverse could contribute to economic diversification and project the cultural richness of the region globally. 6. How could any or all the above benefit from the metaverse? What are the risks? The metaverse could enhance efficiency in delivering government services, foster citizen participation, and offer new economic opportunities, especially in sectors like virtual tourism and online cultural promotion. However, risks include the potential

	exclusion of those without digital access, the technology skills gap, and concerns about privacy and security. Mitigating these risks will require inclusive policies, digital education programs, and robust privacy safeguards.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? What concerns me the most in the context of the Dominican Republic and the Caribbean is the potential digital divide and social exclusion that could arise with the adoption of the metaverse. To mitigate these concerns, I propose implementing digital inclusion programs that ensure equitable access to metaverse technologies, especially in rural areas. Additionally, policies should be established to protect user privacy and promote the participation of diverse groups, thereby avoiding potential discrimination. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? I am excited about the possibility of the metaverse fostering the unique cultural expression of the Dominican Republic and the Caribbean. To maximize these benefits, I propose supporting initiatives that showcase the cultural richness of the region, such as virtual events promoting music, arts, and local traditions. Furthermore, virtual education centered on Caribbean culture could be promoted to preserve and share our heritage globally. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? The implications that concern me the most are linked to inequality in internet access in the region. Given the existing gap, there is a risk of excluding certain sectors of society. To address this, I suggest investing in digital infrastructure to expand connectivity. Additionally, inclusive policies should be designed that consider the economic realities of the region and promote equitable participation, ensuring that no one is left behind in this new digital era. Also, the potential for violence and discrimination in a virtual environment that has no means of regulation, poses us with the challenge of assuring the safety of all users and establishing safeguards. 10. Please share your opinions on at least one of the following: i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations? In the Dominican Republic, the metaverse could serve as a tool to overcome geographical barriers and connect communities. The remodeling of human interaction and culture could drive collaboration in local and global innovation projects. However, digital inclusion is crucial, and initiatives should specifically address connectivity challenges in rural areas. Globally, inclusion and privacy are shared concerns, and the Dominican Republic could contribute to global discussions on ethical standards in metaverse use. ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment? Locally, the metaverse could catalyze sectors like virtual tourism, leveraging the cultural richness of the Dominican Republic. Globally, engagement in virtual economies could diversify national income and create new employment opportunities. The Dominican Republic could form alliances with other nations to

develop digital trade standards and capitalize on opportunities in global virtual commerce.

iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
At the local level, the Dominican Republic could lead efforts to establish regulatory frameworks that reflect the needs and values of its society in the metaverse era. Globally, active participation in international forums would allow the Dominican Republic to influence the creation of global standards that protect citizens and foster innovation. International cooperation would be essential to address challenges such as cybersecurity in the metaverse.

Also, we need to include the creators of the metaverse, technology companies should be an integral part of the conversation on how we govern and [create] policy [for] the metaverse. Academia and universities as focal stakeholders in innovation and education serve as tools to include transparency and openness.

iv. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?
Locally, investment in technological research and development could position the Dominican Republic as a leader in adopting key metaverse technologies. Globally, research collaboration with other countries would enable the sharing of knowledge and collective advancement in areas such as artificial intelligence and virtual reality. The Dominican Republic could contribute to the global development of technological standards that benefit all nations. Regarding the technological implications required, further advancements in immersive technologies such as VR headsets, augmented reality and others would be required before the metaverse can move beyond it being limited to expensive and unintuitive hardware and being able to achieve its full potential.

v. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
Locally, education and training programs could prepare Dominican citizens to actively participate in the metaverse, enhancing their personal and professional growth. Globally, the Dominican Republic could share best practices with other nations to address common challenges, such as addiction and mental health in the digital environment. Collaboration in research on psychological impacts of the metaverse could be beneficial on an international scale.

11. What is the most important question we DID NOT ask in this interview?
I believe you have covered and explored various key aspects of the metaverse. However, some questions that we haven't addressed are related to culture and ethics: How do we anticipate the metaverse impacting cultural identity and ethical norms, both locally and globally? Are there concerns or opportunities related to cultural diversity, preservation, or potential cultural homogenization within this space? Additionally, what ethical principles should guide the development and use of the metaverse to ensure alignment with diverse cultural values?

---------- Suárez End ----------

Written Interview Date
08 November 2023
Responses
Below as Received

Barreiro

Mr Manuel Barreiro Castañeda
Americas (Mexico)
Private Sector (Business)

Part 1: Definition	1. When did you first hear the term “metaverse”? I first encountered the term "metaverse" several years back, perhaps around 2004, as a concept emerging from science fiction and discussions among tech enthusiasts. 2. What was your understanding of that term then versus now? Initially, the metaverse seemed like a distant, futuristic idea—a virtual universe where people interacted and engaged in various experiences. Now, my understanding has evolved. It's becoming a plausible extension of our digital lives, a convergence of virtual and real-world experiences, reshaping how we connect, play, work, and create. 3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The metaverse differs from the internet or social media as it is an immersive, interactive digital space, transcending mere information exchange to offer a 3D experience, blurring the lines between physical and virtual realities. It has the potential to integrate various forms of communication and interaction into a cohesive, shared virtual environment. The key is the full immersion and the possibility of creating and “living/experiencing” the world around you as if it were real.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I take the metaverse seriously, as it represents an evolutionary step in our digital landscape. While some aspects may seem hyped, the metaverse has the potential to significantly alter the way we socialize, work, entertain, and conduct business. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. In the realm of real estate, the metaverse is an exciting frontier that holds immense importance. For the industry, it represents a transformative shift in the way properties are showcased, marketed, and experienced. It's not merely an innovation but a game-changer, offering a virtual landscape where potential buyers and tenants can tour properties from anywhere in the world. For real estate functions and organizations, this shift is pivotal. It's about adapting to a new way of engaging with clients, a dynamic that could redefine how we approach sales, design, and even urban planning. At a city or nation-state level, the metaverse could influence how municipalities handle urban development, architectural design, and property regulations. 6. How could any or all the above benefit from the metaverse? What are the risks? The benefits are vast and exciting. Real estate stands to gain significantly from the metaverse, offering immersive virtual tours, 3D property models, and engaging experiences for clients. It allows the industry to break free from geographical limitations and provides a unique way to showcase and explore properties. However, the risks are equally notable. One of the main concerns involves the discrepancy between the virtual representation and the actual condition of a property. There's a risk of misleading or inaccurate presentations, potentially leading to dissatisfaction or legal

	issues. Striking a balance between providing an engaging virtual experience and ensuring accurate representation will be a crucial challenge to address. In summary, the metaverse's integration into the real estate industry brings incredible opportunities for a more immersive, efficient, and global approach to property presentation and transactions, while simultaneously requiring careful attention to accuracy and ethical representation.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Privacy and security concerns are at the forefront. We need robust protocols, possibly blockchain-based, to safeguard identities and data within the metaverse. Education and transparent policies will be crucial to mitigating these concerns. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? What excites me the most about the metaverse in the realm of real estate is the potential for a revolutionary shift in how properties are experienced and transacted. The idea that individuals can virtually tour a property from anywhere in the world is groundbreaking. It presents a new dimension for showcasing and exploring real estate, allowing for immersive experiences that were previously unimaginable. To maximize these benefits, the key lies in embracing technology and setting industry standards for ethical and accurate virtual property representation. This involves collaborating with tech developers, real estate agents, and regulatory bodies to establish guidelines and best practices for presenting properties in the metaverse. Ensuring a balance between an engaging, immersive experience and an authentic representation of the property is crucial. This includes using advanced technologies like virtual reality and 3D modeling to provide a true-to-life experience, giving potential buyers or renters a realistic sense of the property before physically visiting it. Implementing clear and transparent standards will not only enhance user trust and satisfaction but will also propel the real estate industry into a new era of global accessibility and innovation. 9. What ‘metaverse implications’ are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? The foremost metaverse implications that captivate my attention are the ethical considerations and the impact on personal well-being. These implications are undoubtedly influenced by the current percentage of internet use in various regions. As our lives become more intertwined with the digital world, it's crucial to address the potential consequences that come with this increased virtual presence. To navigate these implications, a multi-faceted approach is necessary. Firstly, there's a need for proactive education and awareness campaigns about responsible and ethical behavior within the metaverse. Ensuring that individuals, especially younger generations, understand the implications of their actions and interactions in virtual spaces is essential. Additionally, the development and implementation of clear policies and guidelines regarding privacy, security, and digital citizenship are imperative. Collaboration between tech companies, policymakers, and communities can help establish these standards. It's vital to strike a balance between innovation and safeguarding users' rights and well-being. Moreover, investing in mental health support and resources tailored to address potential challenges arising from excessive use or addiction to the metaverse is crucial. Fostering

a culture of digital mindfulness and balance can contribute significantly to mitigating any adverse effects.

Lastly, promoting and supporting research and development aimed at creating technologies that prioritize user well-being and safety within the metaverse is crucial. By taking these steps, we can navigate the implications of the metaverse and ensure its evolution in a way that prioritizes human welfare and ethical considerations.

10. Please share your opinions on at least one of the following:
    i. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?

    The economic outlook for the metaverse is like witnessing the advent of a new digital economy that holds the potential to reshape various industries, not just in Mexico and Latin America but globally. The metaverse isn't merely a technological novelty; it's a significant economic driver that can transform how we approach entertainment, education, commerce, and employment.

    In the entertainment sector, the metaverse presents a revolutionary shift in content creation and consumption. With immersive experiences, interactive storytelling, and virtual events, there's a potential redefinition of how we engage with entertainment. This has considerable economic implications, leading to new revenue streams and job opportunities, such as content creation, virtual event management, and platform development.

    Regarding education, the metaverse introduces a whole new dimension of learning. Imagine students from remote areas of Mexico or Latin America accessing high-quality education via virtual classrooms or experiencing historical landmarks through immersive, educational simulations. The economic drivers here encompass the growth of ed tech, the development of virtual learning platforms, and the need for educators to adapt to this new mode of teaching.

    In commerce, the metaverse has the potential to revolutionize the way we shop and conduct business. Virtual showrooms and online marketplaces within the metaverse could redefine the retail landscape. Small businesses, artisans, and entrepreneurs in Mexico and Latin America could reach a global audience through immersive digital storefronts, potentially leveling the playing field for global market access.

    Employment, too, will be significantly impacted. New job categories will emerge, ranging from virtual architects and experience designers to virtual real estate agents and cybersecurity specialists focused on protecting virtual identities. This transformation in job roles might lead to a shift in skill demands, creating both challenges and opportunities for the workforce in Mexico and Latin America.

    The metaverse is not just a technological novelty; it's an economic frontier that, if navigated effectively, could yield significant growth, innovation, and opportunities across various sectors, potentially reshaping how we work, learn, and engage in commerce, both locally and globally.

11. What is the most important question we DID NOT ask in this interview?

    The most important question that hasn't been addressed in this interview is, "How might the metaverse impact marginalized communities and what steps can be taken to ensure their inclusion and equitable access to its benefits?"

    The implications of the metaverse on marginalized communities are crucial. As the metaverse continues to evolve and reshape various industries and social interactions, there's a risk that certain groups, particularly in regions like Latin America, may face disparities in access, representation, or economic opportunities within this new

	digital space. Addressing this question is pivotal to ensure that the benefits and opportunities the metaverse offers are not limited to certain demographics or geographical areas. Moreover, exploring how to prevent the digital divide from widening and ensuring that marginalized communities are not left behind in this digital transformation is critical. This includes examining access to technology, digital literacy, affordability of access, and ensuring representation and cultural sensitivity within the metaverse. By recognizing and addressing these concerns, it's possible to work towards a more inclusive and equitable metaverse that benefits and uplifts all communities, regardless of their background or geographical location.

---------- Barreiro End ----------

Written Interview Date
02 November 2023
Responses
Below as Received

Darwish

Ashraf Darwish
Middle East (Egypt)
Private Sector (Academia)

Part 1: Definition	1. When did you first hear the term "metaverse"? In 2021. 2. What was your understanding of that term then versus now? Virtual world. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? It is a promising technology and better if applied in different applications such as education, healthcare, and social media. It is the next generation of Internet. The metaverse can be defined as a digitally simulated environment that offers users an immersive and interactive experience, surpassing the limitations of the conventional two-dimensional internet. The objective is to provide a heightened and integrated encounter, thereby erasing the boundaries between the physical and digital domains. Social media can be understood as a distinct component of the internet that enables individuals to engage in social interactions, whereas the metaverse aims to provide a whole digital realm. In contrast to conventional modes of communication, the metaverse provides a multidimensional, communal, and interactive environment.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? It is not hype, but it needs time to be used and applied which I expect [to happen] in the near future. The concept of the metaverse has attracted considerable interest and investment, suggesting that it is being regarded with a high degree of seriousness. Although not devoid of obstacles and exaggerated claims, this phenomenon has the capacity to fundamentally transform our digital interactions, professional endeavors, and recreational pursuits. The long-term ramifications of this phenomenon are contingent upon its ability to effectively tackle technical, ethical, and social concerns in its ongoing development. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The significance of the metaverse exhibits variation across diverse sectors, functions, and geographical regions. The tech and entertainment sectors place considerable emphasis on this matter, which has the potential to revolutionize our media consumption habits and online interactions. For enterprises, the implementation of remote work and collaboration tools may have an impact. The influence of a technology on both the city and national level is contingent upon the rate of adoption and regulatory decisions, which in turn have significant ramifications for the economy, social dynamics, and cybersecurity. The significance of the subject matter will undergo further evolution. Metaverse in the future will be used in several applications. 6. How could any or all the above benefit from the metaverse? What are the risks?

	The metaverse has the potential to yield advantages across multiple industries through the augmentation of distant cooperation, immersive education, and novel forms of entertainment. The corporate world is presented with opportunity to engage customers and implement creative marketing strategies. Nevertheless, there are also possible problems associated with the widespread use of technology in society. These risks encompass issues over privacy, the development of digital addiction, the emergence of security threats, and the possibility of huge tech businesses exerting monopolistic power. Achieving an optimal equilibrium between the advantages and disadvantages [is key].
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? The most crucial challenges of the metaverse are privacy and security due to the substantial accumulation of personal data. To address these issues, it is imperative to implement stringent legislation pertaining to data protection and ensure the use of powerful encryption techniques. Furthermore, it is crucial to acknowledge the potential for digital exclusion and take proactive measures to guarantee equal access and affordability. In conclusion, the mitigation of monopolistic power necessitates the implementation of diligent antitrust measures and the establishment of open standards for the advancement of the metaverse. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? One of the most captivating elements of the metaverse lies in its capacity to foster inventive and immersive encounters, as well as facilitate worldwide interconnectedness. To optimize these advantages, it is imperative to cultivate an environment that promotes open and collaborative development within the metaverse. Promoting inclusive engagement and fostering a wide range of contributions has the potential to enhance the cultural and educational dimensions of the metaverse. Moreover, the allocation of resources towards infrastructure development, such as the establishment of high-speed internet connectivity and the provision of easily accessible gadgets, can effectively enhance the accessibility and utilization of its associated benefits. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? The primary considerations associated with the metaverse concept are privacy, data security, digital addiction, and the prospect of a digital divide. These concerns are influenced by the prevailing extent of internet utilization in different geographical areas. To effectively address these issues, it is imperative to implement methods that are tailored to individual regions. The primary areas of concern encompassed in this discussion are the implementation of resilient data protection and cybersecurity protocols, the promotion of digital literacy programs, and the establishment of regulatory frameworks. It is imperative for governments and organizations to prioritize efforts aimed at narrowing the digital gap, so guaranteeing fair and inclusive access to the advantages offered by the metaverse. This is particularly crucial in regions characterized by lower levels of internet usage. International cooperation plays a crucial role in effectively addressing these difficulties in a comprehensive manner. 10. Please share your opinions on at least one of the following: i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

The metaverse possesses the capacity to fundamentally transform several aspects of human interaction, communication, and culture.

- Enhanced engagement refers to the ability to facilitate more immersive and realistic interactions, surpassing the limitations of physical distances and providing novel avenues for expression and connection.
- The metaverse has the potential to facilitate the formation of global communities, enabling individuals from diverse backgrounds, regardless of geographical boundaries, cultural differences, or linguistic barriers, to communicate with one another. This interconnectedness has the capacity to promote cross-cultural understanding among its participants.
- Digital economies have the potential to enable novel economic prospects by means of virtual enterprises, digital commodities, and services.

Nevertheless, these transformations are accompanied by both obstacles and possibilities.

- Inclusivity and Opportunity: The metaverse has the potential to create inclusive environments that cater to the needs of those with disabilities, hence enhancing the inclusiveness of social interactions.
- Challenge: The proliferation of digital technologies has the potential to exacerbate existing disparities, resulting in unequal access and limited proficiency among certain individuals, hence leading to the emergence of digital divides.

Privacy in the Metaverse: Advancements in encryption and privacy technologies present an opportunity to protect personal data within the metaverse. The accumulation of extensive quantities of personal data gives rise to apprehensions regarding surveillance and potential abuse.

Ethical considerations are a crucial aspect that must be considered in any academic or research endeavor. The establishment of ethical rules and laws can provide an opportunity to foster responsible conduct inside the metaverse. The ethical quandary arises when attempting to strike a balance between safeguarding freedom of expression and the imperative to curb hate speech, harassment, and unlawful conduct.

ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?

The metaverse possesses various possible economic drivers.

- The emergence of a novel real estate market can be observed through the sale and development of virtual land and properties within the metaverse.
- Economic activity can be stimulated through the sale of digital goods and services, encompassing virtual commodities, services, and experiences, such as digital art, non-fungible tokens (NFTs), and virtual events.
- Advertising and marketing strategies are employed by companies in the metaverse to effectively communicate with a worldwide audience that is actively involved in digital platforms.
- Education and Training: The metaverse has the potential to revolutionize the field of education through its ability to offer immersive and interactive learning experiences, as well as comprehensive training programs.
- The emergence of remote work and e-commerce has the potential to fundamentally transform traditional work and shopping practices. This shift is characterized by the increasing prevalence of virtual offices and digital markets.

These advancements have the potential to influence a wide range of businesses.

- The potential of entertainment to transform the industry is evident through its ability to offer immersive experiences, virtual concerts, and interactive storytelling.
- Education provides individuals with fresh avenues for engaging in online learning and acquiring professional training.
- The field of commerce has the potential to revolutionize the way products and services are purchased and sold, by facilitating the establishment of virtual storefronts and digital marketplaces.
- The phenomenon of employment in relation to the metaverse has the potential to generate novel job positions in areas such as metaverse creation, moderation, and digital marketing. Additionally, it is anticipated that this trend will have an impact on conventional office environments and the dynamics of remote work.

iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

To promote responsible and secure use of the metaverse, legal and legislative frameworks must encompass key aspects such as privacy, data security, content moderation, and digital rights. Global leaders have the potential to engage in collaborative efforts using international agreements and organizations, to formulate shared rules. This collaboration would facilitate the exchange of best practices and expertise, ultimately enabling a harmonious equilibrium between innovation and the safeguarding of citizens. The collective endeavor has the potential to uphold a metaverse environment that is both globally interconnected and secure.

iv. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?

The recognition of the metaverse's potential requires progress in various pivotal technologies, such as augmented and virtual reality, 5G connectivity, blockchain for digital ownership, and AI-powered content creation and moderation. International collaboration plays a pivotal role in consolidating resources, establishing standards, and fostering research endeavors, so facilitating the advancement of these technologies and guaranteeing seamless interoperability across national boundaries. Collaborative efforts of this nature possess the potential to accelerate the pace of invention and enhance the accessibility and interconnectedness of the metaverse on a global level.

v. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?

Individuals can engage with the metaverse to foster personal growth and educational pursuits through active participation in immersive learning experiences, virtual support groups, and avenues for skill enhancement. Nonetheless, the proliferation of screen time and digital isolation may give rise to several difficulties about addiction, mental health, and identity, while also increasing the likelihood of encountering online harassment or falling victim to identity theft. The process of engaging with the metaverse should encompass the establishment of limits, the advancement of digital welfare, and the cultivation of a harmonious equilibrium between the virtual and tangible realms.

11. What is the most important question we DID NOT ask in this interview?

	"How can the metaverse impact the ecological footprint and physical world, and what measures and criteria can be considered to ensure its development is sustainable and environmentally responsible?" The potential energy consumption and resource utilization associated with metaverse infrastructure and hardware are key considerations.

---------- Darwish End ----------

Written Interview Date
20 December 2023
Responses
Below as Received

Agoria

Mr Sebastien Devaud (a.k.a. Agoria)
Europe (France)
Private Sector (Business)

Part 1: Definition

1. When did you first hear the term "metaverse"?
Maybe it was 12 or 13 years ago. I was with a friend of mine named Nicolas Baker. We got the Oscar for the movie *Sound of Metal*, and he went to my studio, and he showed me a video of Phillip Caddick, the writer. [Caddick] was [speaking at] a conference where he explained to the audience (in the 70s) that we were living in a program computer reality. And he was saying it was [more like] a twist. Every time you have this impression of Deja vu, it's a bug of the system.

2. What was your understanding of that term then versus now?
I think the metaverse was clearly defined in my mind, because, for me the metaverse is an extension of our vision and as we all know, we don't see what's real. So, it's very difficult to imagine saying the metaverse is virtual and what we call real life is real knowing that real life is not real. It's becoming very tricky to compare two things when the first thing is wrong.

   So, I think it's much more complex than just saying we have the physical world and the digital world. I think it's much more complex than two entities. We will continue (with scientists) to look for evidence of things that we think are real or not and, we will slowly, slowly, slowly come to merging points between those two worlds, which is not for the next decade, but for a much longer perspective. And I really feel like Phillip Caddick really pointed it out perfectly in the 70s.

   I don't think there has been much evolution yet to my thinking. It's just scratching the ideas of what's the what. Nowadays it's more into gaming, it's more into education, it's more into entertaining. I feel that it's much deeper than that, of course, so I can't say there is much evolution yet, but everything is ready to be written.

3. How would you compare the "metaverse" to the internet, social media, or any other communication tool?
I don't know if this should be compared. I mean, because if you ask the question.
It forces me to find something to compare with it, but I don't think it should be compared. In the minds of the people, it's scarier than social [media]. I'm much more scared about social media. I'm much more scared about Instagram power than metaverse, utopia.

   I feel that religion is a big part of why people are scared [about the metaverse], and I think it reminds them of the idea that we can have a life beyond the body.

   Metaverse is one life, two bodies, and so it reminds you of the fact that one day you will die, you might have this beautiful idea that you will have a second life outside of your body so people are scared about this because nobody knows if you will have a second life. It's just expectations or doctrines or believing, and so people are scared about the metaverse because it can totally change their perspective. You think that "okay, I'm ready to live outside of my body in the metaverse", then it totally changes the idea about your body, your death, your life in your body. The perspective about the metaverse is also questioning our consciousness [and] our relationship between the mind and the body. And I feel like the body is a vehicle.

	So, if we think of the body as a vehicle, then digital is also a vehicle and I think it's just a matter of one of the vehicles for your soul and [the other] for your ideas. Digital can also be this extension, and the metaverse can be an extension of your body and be another vehicle for all your ideas, all your faults, all your perspectives. So, I think it's much more positive. I don't know how people see this, but it's [a way of] expanding your reality, expanding your consciousness, expanding your possibilities if you want. And because we are [discussing] this, I [am pointing out] the positive aspects of it, but nobody is forced [to participate] of course. I feel like this [can be] demonstrated with energy consumption. I'm not saying everybody should just stay at home [in the metaverse], that's not what I'm saying, but I'm saying this because I was one of those people who would abuse flying, abuse transport, put my body on many flights and trains all over the world to play in festivals. It's not the question here, but I also think that I was enslaved by transportation, I had to travel. My body had to go there and there, and I think it can also be a nice way to change this.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I don't think just the metaverse itself will change everything just by itself, but it's part of a much bigger picture [that] transforms the way [we] see reality, but also politics and consumption and many other aspects, so altogether it's like the butterfly, it's like we're just part of the metamorphosis. We are just at the beginning of the metamorphosis and so it can take many directions. That's also why I'm taking the time to speak with you, because there is so much fear and there are so many people who have the wrong ideas about the metaverse who have the wrong ideas about the digital era, who are scared, who just want to take the money or benefits of it and not think more deeply about what are the consequences and what are the connections between real living and digital. Because I'm really focused on this too, is like to connect both. I like this metamorphosis side because in a metamorphosis, there is a cocoon and there is a butterfly, and they are the same. It's the same here. It's like it's an extension. I really want people to see it this way. So, it's not that it will totally change the world. Humans always want to think they can change the world with their choices, and we don't change anything. We don't have this power. The world is deciding, and the living are deciding much more than our decisions. Even if we think that, I mean maybe for a very short time, 400 years maybe yes, but it's nothing. It will not change everything, but I believe we need to do something. I mean, what you are doing now, Radia, and what I'm doing with you today and I guess [what] philosophers and scientists know; it's very important that we embrace the question to drive the metaverse the right way. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. So, as an artist, it's (definitely) important for me. It's a fantastic game field, a new perspective, immense and perpetual. It's like every time you take a step the road is right in front of you. I'm very amazed to see so many minds [that] want to collaborate on projects. Something very important about [the metaverse] is that you meet people that are very curious and forward thinking, this merging [of] disciplines is mind-blowing. The results [of these collaborations] like what I'm going to do at the Musée d'Orsay are better results. It won't be metaverse. It won't be VR. It's going to be more digital, but we all think together about how we can show digital without screens and without casting. It will bring the light, the sculpture and all these together will materialize to art

	on your phone. I can't say more because you need to go there to experiment in February or March. But the beauty of it is exactly merging this. All our senses, physical senses and, maybe we will [develop] new senses in maybe 20 years brought on after a [new] state of consciousness. And all these experiences might make us develop other tools on our bodies that we [currently] are not allowed access to. I think the first people who were [talking] about metaverse were the Indians. For example, when they said if you want to have access to the real world you need to take off your head, your mask. They were saying that your head, your physical head, was the problem. Your face was your mask. You had to take off your mask and your head to access the world. And so actually the Indians were talking about metaverse a long, long, long time (centuries) ago, [long] before any George Orwell or whatever. 6. How could any or all the above benefit from the metaverse? What are the risks? The risk for me is if we let this become just an entertainment tool, or just an economic tool; even though I don't think that will happen because the metaverse will always have both sides. I mean, people will use it as it is, as entertainment or an economic tool. It will also have artists and minds that will just use it to develop the right things. Security wise, it's important to make sure that identities are not stolen to do things that are not yours, which, on the positive side, is also very important to say that for many people in the world nowadays it is impossible to be themselves because they are slaves of maybe everything in their personal lives. The metaverse can then be a possibility for them to be truly who they want to be, so that's a beautiful thing. On the other hand, people could take advantage of that and abuse people using baiting identities. That's the main concern, scams and hacks.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? It's about educating people. It's about educating customers. It's about educating people not just about education for themselves but educating [them] about the ecosystem itself before they step into what they should do, what they shouldn't do, who they should speak to, who they shouldn't speak [to], what link they should click, what they should have in the wallet, and what they shouldn't have in the wallet. Should [they] have different avatars? All these things [help] to make sure that the rules are respected. They can have security [checks from] time to time for X reasons. I think it's important also to say that [just] because there are security checks [does not mean] everything should be questioned. It's like when we need it. Banks and people are [already] doing this [and it hasn't] stopped people from putting money in the banks [or caused] banks not to exist so, it's the same thing. The same people [that] will abuse people [at banks], will hack [in the metaverse], we just need to grow as fast as possible technologically and security wise. But education is key. We were talking about religion before and I think religion has been replaced by a belief in consumption and I think this belief in consumption might be replaced by belief in ideas and not [as they] appear, but in ideas [regarding] other perspectives. And the metaverse is one of them. I think [the metaverse] will help us [get] back to organizational intelligence. But so far, the living systems are much more complex and much smarter than any digital ecosystem. I want to believe that it's a way also to change for the best and to stop this belief in consumption and go back to believing in positive organizational intelligence. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? [See earlier responses.]

9. What ‘metaverse implications’ are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?
[See earlier responses.]

10. Please share your opinions on at least one of the following:
    i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?
    We used to have static art in our houses everywhere. Paintings, photos, all static art. We used to live with this emotion we have when we bought art or whatever we decided to bring home as the testimony of our taste and identity. And I feel like a metaverse is (definitely) the opposite. In a way, you can have your art in constant evolution. So, your art will not be static anymore.

    I'm not saying it's good or bad. I'm saying it's totally different and I think it's fantastic. I'm working at [an] awesome museum, which is the place of static art. You can watch a painting and you have the feeling that the light is moving but [it is] still static. Whereas a digital artist [can] question the perpetuity of the art of this evolution. And I think the metaverse is great for that. I think it's also a good answer and a good balance with static art. I think both will cohabit quite well.

    ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?
    [Regarding] my musician life and my digital life, people still need to embrace each other physically. It's important [and] we need to keep these physical meeting points in our lives. I feel like there are more and more people going out to festivals and clubs and people want to meet each other and be together and celebrate each other in physical life.

    But [in] my experience in the metaverse on Sandbox with one life, two bodies, [it] was fun to have many guests from all over the world. We don't know each other and in two clicks we know everyone. Until you experience it, [it] is very difficult to say okay it's cool or not. I met so many people through the metaverse and through [the] digital era. But I'm a social man in real life. In real life and in digital life, I'm the same.

    It's much easier [for people who are less social, to be] behind a desk [or] behind the screen, [that experience] too [is] actualized. That's why I love nightlife, because you know, the eyes are not the same [eyes] looking at you during the day.
    So, it's cool.

    iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
    I don't know. I am a citizen of the world and of course I'm French, but I'm a citizen of the world and all these frontiers, all these territories, all these barriers create so much pain, so much hate, that if we could manage the metaverse to bring more peace, we should embrace it.

    I don't think it will happen unfortunately, because again huge companies [will] take the lead on it and economic interests might lead what could have been a good way to bring peace and to bring people together as much as we can. I feel it's going to be tough but would have been fantastic.

iv. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?

Addiction and mental health are not correlated to metaverse for sure. Same as they are not related for gamers, same as they're not related for watching a war movie. Mental health and balance are questions about the equilibrium of each participant. So, it's life. It's who this person is, here, at the moment. It is not entering the metaverse [and] the metaverse changed you.

When I started to do electronic music, people were saying I was a drug dealer. I was playing music for people to become [addicts], [that] this was not music and people were all becoming stupid listening [to] electronic music. Nowadays, electronic music is everywhere, and nobody thinks about this anymore. When I started, I was arrested just because I was playing music in a festival [or] in a club; so, we had to fight to say no, that's just music. It [happens with] every single new genre of music, people saying you create disorder, you are not balanced or you're just stupid.

It's the same with any new attainment, people try to [find] the problem with this person in the metaverse like he played for four days nonstop. The metaverse shouldn't be a place to avoid [your problems], [it should be] a place to create, to entertain, to educate. But someone who wants to avoid his life, because his life is not the one he wanted. For that type [of] person, it's problematic.

I don't believe metaverse will create addiction. I believe people who have addictions may play metaverse. I don't think it's the metaverse that attracted them for that reason.

11. What is the most important question we DID NOT ask in this interview?

What [would] Indians think about our metaverse? That would be the question. And maybe, maybe, maybe, will we finally find where our souls are located?

---------- Agoria End ----------

Written Interview Date
20 November 2023
Responses
Below as Received

Howland

Dr Alex Howland
Americas (United States)
Private Sector (Business)

Part 1: Definition	1. When did you first hear the term "metaverse"? Virbela got its start in an experimental game lab at the University of California, San Diego. Science fiction played a role in the research that was conducted there, so I became familiar with Neil Stephensen's [sic] novel, *Snow Crash*. In this book, Stephensen [sic] shared a vision of a virtual reality space where users could interact and transact in a digital realm. His vivid portrayal of the metaverse as a complex and immersive space left a lasting impression. It got me thinking about the near-term potential of the intersection between virtual worlds and the professional growth of the human experience. The term "metaverse" has become increasingly prominent over the years in discussions surrounding the evolution of the internet and digital connectivity. 2. What was your understanding of that term then versus now? Then, the metaverse was just a dystopian sci-fi view – a speculative and futuristic concept. I didn't pay much attention to it. Today, the metaverse is more tangible with advancements in technology and virtual reality becoming more accessible. That said, we don't get too hung up on the term metaverse itself, but rather, focus on the value–broadly speaking–that some of its underlying concepts can bring to society. At Virbela, we have always focused on the value it can bring to individuals, teams, and organizations. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The metaverse provides an actual place for building community and connection. It builds upon the internet, social media, and other communication tools, while offering a more immersive and interconnected experience. The internet laid the foundation for global connectivity and information exchange, allowing people to access and share data. Social media further facilitated communication (although some may argue that these platforms actually isolated people by discouraging a sense of presence). The metaverse builds upon these concepts by creating a 3D, interactive digital space where users can engage with each other and the environment in a more immersive way.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I don't take the term all that seriously, but I do take the concept and the idea of the metaverse seriously and view the technology offerings that fall within this bucket (VR, virtual worlds, etc.) as tools to drive value in diverse settings. I think the metaverse has the potential to revolutionize the way we connect and collaborate. The immersive nature of VR fosters a sense of presence and interactivity, enabling users to feel genuinely connected in a shared digital environment. While some argue, "do we really want people 'living in the metaverse - wouldn't we rather them live in the 'real world'," I argue that doing things like working in the metaverse will allow us to better live in the physical world. For example, no time wasted in long commutes, the ability to be more migrant, de-urbanization, more opportunities to be with family, etc. I believe the metaverse has the potential to make a lasting impact and redefine the way we live, work, and socialize.

5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.

At Virbela, we're focused on the enterprise metaverse – how these technologies can be applied to the business landscape and how it will shape the future of work, commerce, and collaboration. The metaverse holds significant importance for the enterprise sector, as it presents a transformative opportunity to revolutionize how businesses operate. For example:

- Virtual Collaboration and Remote Work: The metaverse is redefining remote work by providing immersive virtual environments for teams to collaborate. Organizations can conduct meetings, conferences, and collaborative projects in a spatial and interactive manner, fostering a sense of presence and teamwork among remote or distributed teams.
- Training and Development: VR in the metaverse can offer realistic and immersive training simulations. This is particularly valuable for industries such as healthcare, manufacturing, and aviation, where hands-on training is crucial. Employees can gain practical experience in a risk-free virtual environment.
- Enhanced Customer Engagement: The metaverse provides new avenues for customer interaction. Businesses can host virtual events, product launches, or conferences in a way that goes beyond traditional online methods. This enhances customer engagement and offers a novel and memorable experience.
- Cross-Functional Collaboration: The metaverse facilitates cross-functional collaboration by breaking down silos within organizations. Teams from various departments can collaborate seamlessly in virtual spaces, fostering innovation and efficiency.
- Brand Presence and Marketing: Enterprises can establish a unique and immersive brand presence in the metaverse, creating interactive experiences for customers and clients. Virtual events and spaces can be utilized for marketing campaigns and brand building.

The enterprise metaverse offers many innovative solutions to longstanding business challenges and opens new possibilities for collaboration, communication, and operations. Embracing the metaverse can position businesses at the forefront of technological advancement and provide a competitive edge.

6. How could any or all the above benefit from the metaverse? What are the risks?

Virbela has pioneered an immersive enterprise metaverse – an ecosystem of virtual worlds and campuses – to help companies around the world solve today's biggest workplace challenges associated with a remote and dispersed workforce.

While innovation and work achievements are no longer tied to a physical office location, remote work brings new issues to address, [including] lack of engagement and leadership access, learning limitations, organizational silos, and low employee morale from loneliness or camera fatigue. Organizations are challenged with finding innovative ways to adapt to remote and hybrid work, while building office cultures around a sense of togetherness.

The enterprise metaverse is still in its early stages of development, but it has the potential to revolutionize the way businesses operate. For example:

- Collaboration: The enterprise metaverse can be used to create immersive virtual environments where teams can collaborate on projects, share ideas, and learn from each other. This can be especially beneficial for remote teams, as it allows them to feel more connected and engaged.
- Training: The enterprise metaverse can be used to create realistic training simulations that can help employees learn new skills and procedures. This can be a more effective and efficient way to train employees than traditional methods, such as classroom training or on-the-job training.

	• Sales and marketing: The enterprise metaverse can be used to create immersive experiences that can help businesses sell products and services to customers. This can be a more effective way to market products and services than traditional methods, such as advertising or direct mail. • Customer service: The enterprise metaverse can be used to create immersive customer service environments where employees can interact with customers in real time. This can help businesses provide better customer service and resolve customer issues more quickly. We're already seeing the impact that the enterprise metaverse can have on the people and organizations they are a part of. For example, eXp Realty has grown to a multi-billion dollar business with more than 89,000 agents in 20+ countries operating in a fully virtual campus in Virbela. Using Virbela, they've onboarded, trained, and retained agents at record pace, hosted +250,000 hours of virtual training and saved +$30 million in office costs. eXp is the fastest growing real estate company in the world, named by Glassdoor "Best Places to Work" 6 years in a row.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? A primary concern I have about the metaverse is the resistance to change, both on an individual and societal level. Embracing a new digital frontier requires a shift in mindset, and some individuals are more hesitant to adapt. Proactive education and awareness around the metaverse is crucial, emphasizing the benefits and positive impact it can have on collaboration, innovation, and connectivity. Another concern I have is around the potential for bullying and misbehavior within the metaverse. As virtual spaces become extensions of our social interactions, there is a risk of replicating real-world issues, such as harassment and discrimination (as we've seen on social media platforms). To address this, robust moderation systems, reporting mechanisms, and clear community guidelines should be implemented within metaverse platforms. Community safety is an area that's ripe for innovation within AI. Fostering a culture of respect and inclusivity, combined with swift and effective enforcement of rules, will contribute to a safer and more welcoming virtual environment. The readiness of the ecosystem poses another challenge, with factors such as the high cost of VR headsets and the expense associated with customization of virtual designs. To mitigate these concerns, industry stakeholders should work towards improving accessibility. This includes developing more affordable and user-friendly VR hardware, encouraging competition in the market, and exploring innovative ways to make these technologies more accessible to a broader audience. Moreover, simplifying and reducing the cost of customization tools can democratize content creation within the metaverse, allowing a diverse range of users to express themselves without financial barriers. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? What excites me most about the metaverse is its potential to revolutionize the way businesses operate. The metaverse offers a virtual space where teams can collaborate, innovate, and conduct business seamlessly, transcending geographical boundaries. Below are some benefits of the enterprise metaverse and how organizations can take advantage: A digital HQ to build culture and community • Establish the metaverse as a primary business hub, fostering collaboration and interaction. • Create virtual office spaces that mimic physical offices, providing a familiar environment for employees to work together.

Connecting remote/disparate teams

- Leverage the metaverse to bridge the gap between remote work and physical presence.
- Facilitate spontaneous interactions and team-building activities in virtual environments, enhancing the sense of camaraderie among remote teams.

Enhanced Learning and Development (L&D) or simulation programs

- Develop simulations that allow people to get "real-world-like" experiences in a way that is safer, immersive, and more affordable. Learners can collaborate, communicate, and problem-solve together in real-time, fostering a sense of teamwork and camaraderie.
- The interactive nature of virtual worlds enables hand-on learning, enhanced retention and application of knowledge that fosters a deeper understanding of complex concepts – can be particularly useful for industries such as healthcare, aviation, or emergency response.

Host more engaging meetings

- Capitalize on the immersive nature of the metaverse to offer more engaging and dynamic meetings than one would have over traditional video conferencing solutions.
- Incorporate spatial audio and 3D visuals to simulate face-to-face interactions, surpassing the limitations of traditional video conferencing.

Environmental benefits

- Reduced commuting and office energy consumption in the metaverse.
- A sustainable alternative to physical offices, contributing to a lower carbon footprint.

Economic benefits

- Cost savings associated with virtual offices in the metaverse, such as reduced office space expenses and travel costs.
- A more efficient and streamlined virtual work environment.

Accessibility:

- The metaverse is accessible to a diverse range of users, including those with disabilities.
- User-friendly interfaces and support for various devices to enhance accessibility for a broader audience.

To maximize these benefits effectively, it is essential to invest in building out metaverse platforms and the ecosystem/tech around it, establish robust security measures, and develop ongoing user education. Companies should also look to identify success metrics and run tests internally to measure performance and retention of these metaverse programs within their organization.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

The metaverse implications that are top of mind for me focus on the enterprise [metaverse] – they span various themes, and each are critical to its success and widespread adoption. Progress in hardware accessibility, platform quality, organizational readiness, and the resolution of social, economic, and ethical considerations are interconnected and must advance collectively to unlock the full potential of the metaverse.

Market adoption: Recognizing the substantial shift in how business is conducted, it's clear that widespread adoption of metaverse practices will take time. This shift requires a fundamental reimagining of traditional business models and practices, necessitating a gradual transition to ensure seamless integration.

Organizational readiness: Organizations need to adapt to the metaverse, and a clear understanding of best practices is crucial. Demonstrating use cases, establishing success metrics, and showcasing tangible benefits will accelerate the change readiness of organizations.

Platform quality: The success of the metaverse hinges on the quality of the platforms that drive it. User-friendly interfaces, realistic simulations, and seamless interactivity are essential components that must progress in tandem with user expectations.

Hardware accessibility: Accessibility to affordable and user-friendly hardware, such as VR headsets, is key to the development of the metaverse ecosystem. Ensuring widespread access to these tools is crucial for broadening participation in the metaverse.

Developing the metaverse ecosystem: A thriving ecosystem will contribute to a more dynamic and versatile metaverse experience. This includes the creation of diverse and interconnected virtual spaces, applications, and services.

Additional implications include:

- Technological advantages: Leveraging and understanding the technological advantages of the metaverse, such as enhanced collaboration, data visualization, and immersive experiences, will be crucial for maximizing its potential across industries.
- Social and cultural impacts: The metaverse has the potential to reshape social dynamics and cultural interactions. Understanding and managing these shifts will be essential to fostering positive experiences.
- Economic considerations: The economic implications are significant, from creating new business opportunities to altering job structures. Examining the economic impact and ensuring equitable distribution of benefits is essential.
- Privacy and security concerns: Addressing privacy and security issues is paramount to building trust in the metaverse. Robust measures must be in place to safeguard user data and ensure secure interactions within virtual spaces.
- Legal and ethical considerations: As the metaverse evolves, legal and ethical frameworks must adapt to address new challenges. Clear guidelines and regulations are necessary to govern virtual interactions and transactions.
- Accessibility and inclusion: Ensuring that the metaverse is accessible to individuals of all abilities and backgrounds is imperative. Inclusion should be a guiding principle in the development and implementation of metaverse technologies.

10. Please share your opinions on at least one of the following:
    i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?

    To fully realize the metaverse's potential, we'll need to continue to see technological advancements in the following areas:

    - Immersive technologies: Advancements in VR and AR hardware and software are crucial for creating immersive virtual environments within the metaverse.
    - AI and machine learning: AI and ML technologies can enhance the interactivity and responsiveness to virtual environments by creating intelligent agents that simulate human-like behavior and adapt to user interactions.
    - Scale and stability: Developing scalable and stable infrastructure is crucial for accommodating a large user base in the metaverse.
    - Accessibility and affordability of design: This must be prioritized to ensure that a diverse global population can participate.
    - Usability, localization, and translations: Improving the usability of metaverse platforms, localization capabilities, and translation services are essential for

	ensuring a seamless and inclusive user experience across diverse linguistic and cultural backgrounds. • Policy development and ethical standards: Establishing clear policy frameworks and ethical standards is crucial to guide the development and use of the metaverse, addressing issues related to user rights, data protection, and responsible content creation. • Shared privacy expectations: Developing advanced privacy-preserving technologies and ensuring transparent data handling practices are necessary to address concerns related to user privacy within the metaverse. • Technological convergence: We'll also need to see the convergence of these technological advancements including interconnected virtual spaces, applications, and services. International collaboration will help drive the development of the metaverse by fostering a global perspective, integrating diverse cultural insights, and ensuring that solutions cater to a global audience (vs. one-size-fits-all). This collaborative approach will contribute to the creation of a more inclusive, ethical, and user-friendly metaverse experience. Understanding different global needs and organizational structures: • Recognizing and understanding diverse global needs and organizational structures is essential for tailoring metaverse solutions to specific cultural, economic, and organizational contexts. • Collaborating across borders facilitates a deeper understanding of regional differences in needs and organizational structures. This knowledge exchange informs product development, ensuring that metaverse solutions align with diverse global requirements. Understanding different work values, cultural differences in workstyles: • Recognizing and adapting to different work values and cultural variations in workstyles is critical for creating metaverse solutions that resonate with users from various backgrounds. • Collaborating internationally allows for insights into diverse work cultures and values. This understanding informs the development of metaverse tools that support varied workstyles, fostering inclusivity and effectiveness in virtual work environments.

---------- Howland End ----------

Written Interview Date
28 November 2023
Responses
Below as Received

Orero

Dr Pilar Orero
Europe (Spain)
Private Sector (Academia)

Part 1: Definition	1. When did you first hear the term "metaverse"? Many years ago, when Second Life became popular. 2. What was your understanding of that term then versus now? At the time it was more a communication platform, very much inspired by videogames. Now it can be an air conditioning system, with no human interaction, but the system ingesting data from humans. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? I think this question is a bit strange. Yes, I would compare metaverse/internet because there is no need for any human interaction for communication. Social media/Communication tools are for humans if I think I understand what you mean.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? It should change everything. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. Amazingly important, because I work in education, and already you have universities which advertise they have their own Metaverse. Education will certainly change a lot. The second is research, and again, in my research which is alternative communication and media accessibility it will be massive the change, and the amazing opportunities. 6. How could any or all the above benefit from the metaverse? What are the risks? With my definition of metaverse, it is a bit irrelevant. To me only when the human/digital human/avatar is interacting (citiverse) is interesting. The benefits are endless from working, studying, entertainment, family, etc., etc., etc.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Who will be the regulator, and what standards will be followed. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The research questions for example re. avatars. It is fascinating to understand how a digital human will be represented with not only physical attributes, but also as a kind person, a sustainable person, a blind person, etc., etc., etc., and how the system will be enriched to understand the avatar requirements. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

	a) Act as fast as possible, b) produce standards asap, c) appoint a regulator or governance. 10. Please share your opinions on at least one of the following: i. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity? A lot of work will be needed to avoid massive exclusion. The metaverse will make the digital gap 10 times worse, so working against exclusion is to me a priority before is too late. 11. What is the most important question we DID NOT ask in this interview? Should a metaverse include a digital human?

---------- Orero End ----------

Written Interview Date
21 November 2023
Responses
Below as Received

Bayona

Ms Natalia Bayona
United Nations (WTO)
Third Sector (Non-Governmental Organization)

Part 3: Implications

1. Please share your opinions on at least one of the following:
   i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

   Reshaping human interaction, communication, and culture: The metaverse represents a new medium for human interaction, offering people new ways to engage with each other in a cross-over between the virtual and the physical worlds. Rather than reshaping human interaction, communication, and culture, the metaverse has the potential to enhance them by expanding meaningful exchanges between people across diverse backgrounds, languages, and geographies. For the travel sector, this means more people will have access to potential destinations and even experiences, which may result in increased interest in traveling.

   Challenges and opportunities for inclusivity, privacy, and ethical considerations: One of the advantages of the metaverse is the inclusion of those who may experience difficulties in dealing with a trip in the physical world such as people with disabilities and elderly people. The metaverse offers these vulnerable groups the opportunity to experience tourism and travel, and thus broadening accessibility and inclusion. As a new and emerging technology, the metaverse may face privacy and ethical risks in its early years as regulators catch up to the innovators. Another opportunity would be virtual tourism to restricted or inaccessible locations - the metaverse will open opportunities to visit historical sites that have been recreated virtually, access restricted locations that are closed to the public and visit locations of vulnerable communities. The potential use-cases for the metaverse are expansive and growing, which presents regulators with a challenge in implementing policies to a dynamic field meant to protect privacy and maintain ethical considerations.

   ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?

   Economic potential of the metaverse: The metaverse is set to reward the tourism sector with USD 20 billion by 2030 with use-cases of the metaverse currently spread across various phases of the travel experience. Virtual and augmented reality are expected to contribute USD 1.5 trillion to global GDP by 2030 compared to USD 46 billion in 2019 and these benefits are set to rise to USD 3.6 trillion by 2035. The metaverse's potential impact on the global economy is significant and it's driven by opportunities across a variety of sectors. For example, for the entertainment sector, Metaverse revenue for live music concerts already experienced a 10x growth from 2020 to 2021, catalysed in part by the global pandemic.

   iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

   The use-cases of the metaverse are dynamic, presenting challenges for regulation: The metaverse can be applied in a wide variety of ways across many sectors, in

addition the use-cases of the metaverse are not finite but are rather dynamic in nature. This complicates efforts to establish regulatory and policy frameworks aimed at ensuring responsible and safe usage, particularly as new uses for the metaverse are increasingly defined.

Global and inclusive collaboration can enable the development of guidelines to advance innovation while safeguarding citizens: Collaboration across a broad range of stakeholders, including academia, innovators, entrepreneurs, and global leaders is needed to advance the development of effective guidelines to spur innovation while safeguarding citizens. Coordination between the technical and political spheres is critical to ensure policymakers are informed by developments in the field, particularly since it is dynamic and fast-changing. Furthermore, metaverse experts can collaborate to identify needed guidelines as well as risks posed to citizens that can be addressed by cooperation and regulation.

iv. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
Education and skills: The metaverse can be utilized as a useful tool for experiential learning, offering individuals opportunities to learn by doing in safe environments. For example, in the tourism sector, the metaverse is already being utilized to increase training for staff and learning opportunities. At the individual level, enhanced access to learning opportunities and modes of education enables personal growth and education. At the broader level, the metaverse can be used to enhance skills of the workforce of various sectors.

Mental health and well-being: As with any immersive technology, it is key that the metaverse is not over utilized in a manner that is not healthy. Overutilization, particularly inhibits an individual from functioning at a normal capacity in daily tasks, could possibly lead to mental health or metaverse addiction implications. While I am not a mental health professional, moderation in utilization is probably the best way forward.

2. What is the most important question we DID NOT ask in this interview?
How the use of the metaverse can affect the tourism promotion of destinations?
- Metaverse as a marketing tool: The metaverse will be another platform to attract customers to tourism and hospitality offerings, presenting an interactive and engaging space to offer customers valuable information about a destination that cannot be accurately provided in other ways. Destinations can be marketed and featured across a variety of platforms within the metaverse, including video games and virtual platforms.
- Enhancing the customer journey/experience: The metaverse can assist customers in making a more informed choice when selecting their tourism experience as well as improving the booking experience. Customers can explore the environments of a hotel in the metaverse before buying it for a "real" trip, to get an idea of how big the rooms are and what services are offered, explore the destination in advance before booking it, get to know the avatar of the guide who will physically meet them once they arrive at the facility, or enter a museum from the comfort of the sofa at home.

---------- Bayona End ----------

Written Interview Date
01 November 2023
Responses
Below as Received

Bray

Dr David Bray
Americas (United States)
Third Sector (Non-Profit)

Part 1: Definition	1. When did you first hear the term "metaverse"? Circa 1992 - *Snow Crash*. 2. What was your understanding of that term then versus now? It was in a science fiction context. Later I did a lot of work in the 2006-2008 period researching virtual worlds (outgrowth of VR). Then Facebook (now Meta) brought back a lot of these concepts from virtual worlds - just with better equipment, better software, and better interfaces. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The internet is composed of the TCP/IP, which includes an application layer. Social media sits on that application layer, as do other tools. Metaverse similarly sits on the application layer too - some have said it might be a spatial computing layer, however that still is just an extension of the application layer.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? Depends on whose definition of the metaverse is being employed here. Facebook/Meta's? If so, [there] were some interesting ideas that didn't translate into business reality well. Apple's? Remains to be seen. The question is whether people can afford and find accessible the hardware necessary to navigate the metaverse. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. At present, it is not that important. And AI zeitgeist has overshadowed the metaverse. 6. How could any or all the above benefit from the metaverse? What are the risks? Benefits and risks are tied to whether people can afford and find accessible the hardware necessary to navigate the metaverse. Also, whether [they] behave cooperatively or [are] asocial in a virtual environment.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Return to first principles: (1) what do people individually and collectively need, (2) how might those needs be addressed, and (3) see if the Metaverse can address those needs. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? There is the possibility to help people overcome the limits of perception and physical identity. There is the possibility to bring people together across locations. However, will people behave cooperatively or [be] asocial in a virtual environment?

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?
   Benefits and risks are tied to whether people can afford and find accessible the hardware necessary to navigate the metaverse. Also, whether [they] behave cooperatively or [are] asocial in a virtual environment.

10. Please share your opinions on at least one of the following:
    i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?
       There is the possibility to help people overcome the limits of perception and physical identity. There is the possibility to bring people together across locations.

    ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?
       On economics - depends on whose definition of the metaverse is being employed here. Facebook/Meta's? If so, it was some interesting ideas that didn't translate into business reality well. Apple's? Remains to be seen.

    iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
       Are the challenges here any different than the Internet's existing geographical blurring issues, especially in cyberspace? Or how AI will challenge geographical boundaries as well.

    iv. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?
       The question is whether people can afford and find accessible the hardware necessary to navigate the metaverse.

    v. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
       The metaverse may be most useful as an individual tool to achieve some of these things - if we can overcome the user experience hurdles. That said, will the metaverse be part of a large technology play that includes data, the metaverse, AI, and more?

11. What is the most important question we DID NOT ask in this interview?
    What will historians still be talking about in 20 years: (1) blockchain tech, (2) the metaverse, or (3) generative AI?

---------- Bray End ----------

Written Interview Date
23 November 2023
Responses
Below as Received

Curran

Mr Noel Curran
Europe (Switzerland)
Third Sector (Non-Profit)

Part 1: Definition	1. When did you first hear the term "metaverse"? When Zuckerberg promoted Meta in October 2021. 2. What was your understanding of that term then versus now? Then: Immersive and interactive personal experiences enabled by virtual glasses. Now: Experiences in an immersive 3D virtual space focused on social connection and gamification. The EBU took a conservative approach, relying upon decades of experience in attempting to create audiovisual immersive experiences, as we were skeptical about the technology's potential reach and added value to audiences. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The metaverse is an attempt to add multi-user gamification to the means and functions the internet now provides to society. But so far, the proposed experience is only partially achieved and not useful enough to get traction. Existing VR glasses are not a solution because they are neither casual nor portable enough, and their use [is] too exclusive to integrate easily into every-day life. Interfaces that can in principle be used anywhere and anytime have a greater chance of success. For example, augmented reality technology could integrate more easily with every-day human social experiences.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? We see the metaverse as an experiment in motion that informs the thinking around future media content and experiences. We see it triggering some technological developments that could remove barriers. And we think it provides hints of what future content creation capabilities may be like. For the media sector and our members, these points have proven substantial enough to warrant keeping an eye on them. We've run workshops such as Demystifying web3.0, metaverse, XR and NFTs in October 2022 and started a working group on Media Technologies in the Metaverse to help EBU Members better understand, prepare for, and if relevant, shape, the technology or what it may lead to. We've also published a report with thoughts on the Metaverse for Public service broadcasters. Currently, a number of EBU Members are experimenting with VRChat, Minecraft, Roblox and Fortnite, gathering expertise, and waiting for new experiences to be designed and new ecosystems to emerge. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. Our member organizations are exploring the potential of the Metaverse for a range of objectives. These include: • Creating immersive and engaging experiences that allow users to explore historical events. • Experimenting with new digital formats for sports and cultural events. • Creating virtual spaces for special celebrations.

	• Developing new applications for citizen journalists. • Exploring the use of permanence and 3D avatars in the metaverse. Fundamentally, the metaverse includes opportunities to transform the way we interact with audiences, across entertainment, culture, and news. Developing new skills in content creation, production, and immersive experience design will be a requirement for organizations seeking to leverage this technology. Collaboration between media organizations, technology companies, and other stakeholders will be essential to shaping the future of any potential metaverse. However, the future of this space remains uncertain, as required skills and technologies continue to evolve and monetization models are yet to be established. As new audiences experiment with this technology, content providers will innovate to find new ways of creating compelling experiences and telling engaging stories. As with all uncertainty, finding the balance between investing in skills and understanding, whilst remaining agile for new developments, will be essential. 6. How could any or all the above benefit from the metaverse? What are the risks? In all the above, the metaverse is a basic facilitator. It is possible that the emergence of advanced AI technologies may accelerate the search for, and creation of, successful experiences. A potential risk of the metaverse is social isolation. Public services media are interested in combining the power of technology with the ability to bring people together, rather than locking users in isolated bubbles.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Strategy and Costs • What is the business model and economics of operating in the Metaverse? • What is the cost of making content and its influence on production and operations? • What audience can be expected? • What skills are available and are they available internally? If not, better to develop them internally or outsourcing? • Is Metaverse new content and audiences, or a transfer of existing? Technical Capability and Content Format • Is the technology capable of handling millions of concurrent users? • What types of content should be used and on which platforms? • What devices should be targeted/considered? Intellectual Property and Regulation • What are the IP rights in the Metaverse? • When will the Metaverse be regulated and how will it affect operations? User Engagement and Moderation • How can we engage with users in the metaverse and what tools can we use? • What is typical user behaviour, how is this changing? • How can we moderate content? Safety and Legal Considerations • Which platforms are safe? • What legal and regulatory issues must be considered? • What is the public service role? • Are the available tools sufficient for security and safety? How to get the answers • Sharing knowledge

- Joining the fora discussing Metaverse & web3.0 topics, to keep abreast of the latest technologies, technical standards, and regulatory environment.
- Cross-collaborations & single initiatives on concrete pilot projects to gain knowledge and to answer the questions listed above.

Options for the public service broadcasters are currently:

- To not do anything, with the risk of losing knowledge and audiences, especially younger audiences.
- To avoid launching any service now but to keep experimenting to get ready for a potential launch.
- To develop an offer on existing platforms after understanding how good they are in implementing their code of conduct (e.g., avoiding bullying, stalking, trolling, harassment, intimidation, inappropriate content, etc.).
- To implement a Metaverse inspired by Public Service values, focusing attention on privacy & data, accessibility, licensing, interoperability, safety, governance, moderation, etc.
- A combination of 3 and 4.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?
   See above.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?
   See above.

10. Please share your opinions on at least one of the following:
    i. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
       A real opportunity is to improve personal education by making it available independently from geography (e.g., in the context of migration etc.) and by facilitating emotional connection.

       Regarding potential risks, the existing social media services and their use provide good pointers, with the potential for them to be further magnified by an immersive experience. Strategies will need to be found to manage risks such as bullying, stalking, trolling, intimidation, inappropriate content, radicalization, and the erosion of other 'vertical social layers' such as family or school.

11. What is the most important question we DID NOT ask in this interview?
    How should the Metaverse be?

---------- Curran End ----------

Written Interview Date
01 December 2023
Responses
Below as Received

Sey

Dr Araba Sey
Africa (South Africa)
Third Sector (Non-Profit)

Part 1: Definition	1. When did you first hear the term "metaverse"? I first heard the term about two years ago, shortly before Facebook changed its name to Meta. 2. What was your understanding of that term then versus now? My understanding then was that it referred to a new product that Facebook was developing to offer a more immersive virtual/online experience for its users. The main difference in my understanding now is that I don't associate the metaverse only with Facebook/Meta. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? I see them as essentially the same in terms of being platforms for social, economic, political, etc. engagement in cyberspace. The main difference being that it appears to enable even higher levels of immersion. I am uncertain the extent to which this experience differs from multiplayer gaming platforms, for example.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I think it's mostly hype for most people. But it will also probably change everything for some people. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The metaverse is relatively unimportant to my industry (which is research), function (which is research and people management), organization or geographic location (which are in Africa and the US). I am yet to clearly see what the metaverse environment offers that cannot to a greater or lesser degree already be achieved via previously existing platforms and technologies. 6. How could any or all the above benefit from the metaverse? What are the risks? A key risk is that real world dangers, harms and injustices are replicated in the metaverse. Another is that the metaverse becomes another fault line along which new digital divides and social/economic exclusions emerge.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? I feel I do not understand the metaverse adequately enough to have concrete concerns. But see response to question 9 below. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? I feel I do not understand the metaverse adequately enough to grasp its potential.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

The topmost implication for me is the further expansion and deepening of digital and social divides. To some degree this view is indeed influenced by the fact of relatively uneven distribution of internet-enabled devices and internet access in my regions of interest. While the challenges cannot be completely eradicated, their impact can be potentially lessened by paying attention to global, regional, and national experiences with previous and currently more prevalent mainstream technologies and drawing lessons so as not to repeat mistakes of the past. Investments in the metaverse should be balanced with continued investment in the technologies that are most prevalent for most communities. The emerging ecosystems should be designed to be able to accommodate nonparticipation in the metaverse for those who are unable or choose not to participate.

10. Please share your opinions on at least one of the following:

This response applies to all the listed topics [below]: If history is anything to go by, the metaverse will mostly reinforce existing social, economic, political, technological, and personal systems and tendencies. It will be largely driven by entities seeking avenues for commercial gain, especially through datafication of users. Some individuals and communities might be able to leverage features for personal and community development, but as I've noted, I'm unclear on what the metaverse enables that people are not already able to do. Attempting to realize the positive potential of the metaverse will require first clarifying what that potential is in concrete terms and how it is an added value to existing modes of interaction.

i. Societal Transformation: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?
ii. Economic Outlook: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?
iii. Governance and Policy: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
iv. Technological Implications: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development?
v. Individual Empowerment: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?

11. What is the most important question we DID NOT ask in this interview?

I can't decide which is more important, so here are the two that come to mind for me:

- Have you ever been in the metaverse?
- What unique value does the metaverse offer?

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Written Interview Date
20 December 2023
Responses
Below as Received

Tabet

Mr Mounir Tabet
United Nations (ESCWA)
Third Sector (Non-Governmental)

Part 1: Definition	1. When did you first hear the term "metaverse"? It must [have been] three or four years ago. I'm by nature a very curious person because I believe we are living sub-optimally as a human species. We can do a lot more, so I'm always looking for diverse perspectives. I don't recall where, when and [in] what context I heard of the metaverse. 2. What was your understanding of that term then versus now? Well, then it was more of a gaming perspective and interesting transportation into an immersive environment. It was more gaming than anything else. Now, primarily because of the work we have been doing, it's a lot more of an incredibly powerful (potentially powerful) tool if all the elements are there for it to be used in advancing the human potential. At the time it was avatars and things of the sort. Now there are so many additional layers added to my understanding. I am also happy to see more and more users come to the service rather than creators. By that I mean, I think earlier on the metaverse and its conversation was dominated (and it's still to a large degree) by technologists who demonstrate the information communication technology backbone of it, the speed of the Internet connection you [must] have, the complexity and lack of complexity of the coding that you have to go there, the rules about avatars and [the] behavior in a particular context, and more and more. And that's the part that I identify least with. The part that I identify more with is the so what? What do you use it for? And that's the area of interest that I have. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? First, let me go to non-interactive social media where you leave a post and then you come back at some stage, you either see a reaction to it or you don't. Whereas, in the metaverse, at least the way I imagine it, it's much more instantaneous, interactive, immersive in that you are not at the same time doing something else. You are not watching TV and posting something, you are not having dinner and doing something. So, it's the immersiveness, the timeliness of the response; and you can be quite focused if you intend to dedicate yourself. I think of the metaverse as either conversations with multiple people or avatars or others that you are interacting with, or a very focused conversation and interaction. The difference is [that] it's no longer just a conversation, it's so many more layers because of the possibility of physical movement and interaction with objects and with others that are interacting with you.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I think it depends on how soon the conversation moves from those who are working on the necessary part, which is the definition, the standards and all that, into users. The sooner the better. Even if everything is not fully defined, I think it must have an organic evolutionary process. Even if it were a little bit messy, I think it's proof of utility that's going to make a big difference.

One of the areas I think is extremely relevant [is culture]. So, you've got a culture, or you've got an archaeological site [where] the oral tradition is extremely important [and, for example] the narrator is sitting under a tree or in a tent and telling stories of the old days. Well, you know, it doesn't matter how much money you pay as a tourist, you're not going to go where the narrator is sitting because that was 2000 years ago. That was 1500 years ago. But [imagine] recreating that. If I take a Western perspective, imagine yourself sitting in the theater where Shakespeare wrote his plays. In the metaverse, you can do that. Anything else you can't. You're immersed in that, and what that gives you is a three dimensional, [or rather] a multidimensional [experience] because it's not just three dimensional with physical, you then augment it with all the other senses, with hearing, you can even have smells. The transformation will be immense. So that's the part that says the metaverse is about to change everything. Absolutely, fundamentally, everything.

Then you get into the philosophical question of when you distinguish reality from non-reality, but that's for another conversation.

When COVID-19 was here, the experience that people had with online education and online work, set the ground[work] or the basis for what the metaverse could potentially offer those who might be interested in online learning. But not sitting behind the screen like we are sitting, but rather walking around a virtual space, meeting each other, and looking at experimental settings. We are a bit far from reaching there yet because there's still a lot more that [needs to be done], but the potential is there and one of my favorite examples is from a small village in Morocco or Nigeria or Tanzania and you get a chance to go study medicine in Europe or in the States, and for whatever reason you've decided to stay and work there for the next few years, but you want to give back to your community. You can connect with a rural clinic through the metaverse, through a virtual reality set and you are there with the examining physician, examining a complicated case. Telemedicine then becomes powerful, particularly when you start applying what is already possible through remote surgeries, through all kinds of things. So, the implications for health, education, tourism, environmental dimensions, agriculture is just immense, and we are just beginning to scratch the surface.

Obviously, there are negative implications from the cybersecurity perspective.
The moral, ethical perspective, loss of identity more interestingly, the creation of multiple identities. And then okay, so you can manage a couple of those [identities] and then of course imagine, [if] one gets really immersed in those identities, [what happens] when they switch off their virtual reality device? At that moment, they are still lost as to which identity they belong to. The complexity is going to be enormous.

5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply.

We are about to conclude a report on the implications of the metaverse for the Arab region. It's part of a series that we're doing [on] the megatrends that [are] evolving in the world and in this region and what are the public policy decisions that need to be made now to ensure that when this megatrend lands, it minimizes the negative and augments the positive to the [greatest] extent possible.

The first one we did was on electric mobility. And so, what are the implications in terms of charging standards, charging stations; electric [or] solar charging stations in this region, which is very much a possibility, what does it mean for employment? The next one is about metaverse and the [one following] will be about artificial intelligence, which we will start in March of this coming year.

For the region, I think the metaverse has the potential of becoming a great equalizer in the sense that you don't need a heck of a lot of investments to be able to reach skills [or] knowledge capacities that are out there. So, you've got a country like Saudi Arabia that is very wealthy and can invest in R&D in the metaverse, particularly in the Arabic

language, but if you are a poor country in the region, you can make use of all of that. What others have invested in, particularly when it's in the public domain, so it's going to be extremely important in terms of Arabic content, in terms of connecting people, in terms of lifting everybody with the same wave as you lift the few countries.

That is one potential implication. We do a lot of work that has to do with conferences, expert group meetings, conversations and so on. We have something called the Arab Forum for Sustainable Development. Each of the five regions has this regional forum for sustainable development. It's usually chaired by the Deputy Secretary General. The number of people at these events is usually about 500. Post COVID, because we had to do most of [the meetings] online and hybrid, the number jumped immediately to about 1500, because 1000 [more people] could now afford to attend, [those who may] not [have] been able to afford to travel. Now you can imagine, a few years from now when we create our own metaverse environment, our own campus, our own conference rooms, attending side events without necessarily needing to be physically there, so the potential is just enormous.

6. How could any or all the above benefit from the metaverse? What are the risks?

There [are] a lot of people who are talking about the risks. I must confess that I have done a lot more of thinking on the positive implications rather than the risks, but I think all the areas of cybersecurity, not only in terms of multiple identities and loss between multiple identities, but also the harm that can be done by ill-intentioned people, particularly when they target children, when they target innocent people with attractive [or] interesting material but that material doesn't meet the moral and ethical standards.

I'm going to tell you a very funny story about what happened to me. A few years back, my then 10-year-old son, or 12 years old at the time, was playing a video game with his friends. And I asked him, and he referred to it as GTA. And I asked what is GTA? And he said it's the Great Tuna Attack. I didn't make [much of] it but thought about it throughout the evening. I got to also have a conversation with his friends, and I saw that it was *Grand Theft Auto*, GTA Grand Theft Auto, which had to do with stealing cars and shooting each other. If you are trying to instill moral, ethical standards in your 12-year-old, the last thing you want to tell him is how exciting it is to steal a car, and then, you know, shoot somebody and then fight. So, his way out was to tell me it was the Great Tuna Attack, which was okay, but you can imagine if something much more nefarious were to happen; and the guardians of the child are not there or cannot relate to that language.

You used a term, and I think this is very important for me. You used the term “digital twin”. Because I have had some kind of interaction, I get what that is, but I think a lot of people don't, and I think we really must work on language that people get, that people understand, that people are not going to shy away from or be afraid of or be threatened by.

So, the risks, as I said, they are ethical from a cybersecurity perspective, from an identity perspective, loss of control perspective and a different use of language. This is the list of risks that I can think of.

You know I am an economist by training and there's an expression that says the economy is too important to be left to the economists alone. The metaverse is too important to be left [to] the creators alone. There must be interaction by the users, and you start with the most basic user to understand their fears, their values, their hopes, their ambitions; because you want to be responding to a need out there while creating it and fashioning it of course, but not impose a created need that may not be in response to a real requirement. You don't want to create a demand that isn't responding to a real need, and right now there are two types of creators. There are the excited technologists who are just pushing the envelope on what is possible, and those are great. Then you've got the opportunists who would say “great, I just have a big business idea and it's going

	to make me millions of dollars", develop it and then launch it out there. And those are potentially great, but also potentially problematic.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? The idea of developing language that is accessible to the least sophisticated users, digital twins, you can be sure that that already turns off so many people. Who are potential users of augmented reality? If you just begin to [identify] the potential users of this enormous potential [and] start talking about the measures that either are currently being taken or that are being considered to enhance security and minimize the risks. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? See above. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? Well, you will note that our conversation started about an hour late. Precisely because I had Internet connection problems. No matter how great the solution is, if you can't reach the target audience and I'm thinking the target audience is a nine year old kid in the rural area somewhere who can be exposed to beautiful art, beautiful music, to science, to learning, by just immersing themselves into this world, you can imagine if it's AR, Oculus, in a small Community Centre where you have a local teacher who is guiding the community in interacting with the world out there. Internet connection is extremely important [and] language is [also] very important [to] minimize fears, because as you can imagine, there are plenty of fears out there. So, you marry artificial intelligence with the metaverse, and most people think, my job is on the line. Some jobs are on the line, but so many others are going to be created. 10. Please share your opinions on at least one of the following: i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations? So already we see implications of that. Not from the metaverse, but from its predecessor, social media, which we're still living [with] right now. Particularly of late, a lot of people feel that they must have an opinion and they must express themselves. And if they don't say anything, there's something wrong with them. And the more controversial, the better, right? You've got an environment right now where it's really polarizing and you [don't] know who's behind the anonymous Twitter account or the anonymous Instagram or Facebook or whatever. The level of anonymity from the metaverse is probably going to be augmented, not diminished, and the potential for even further polarization and divisiveness is very high. So, we've got to be guided by things more than look at the cool new gadget I've just come up with and look at the cool new application that we've come up with and the evidence that it's so cool that I already have 20 million subscribers. Yes, 20 million people who are going to go off the deep end in something that is completely crazy from an ethical perspective. The mosque and the church played an important role in guiding people, but they no longer do that. People have lost, to a certain degree, trust in, not just the mosque and the church and institutions, but have lost trust in most places of authority, because authority has disappointed people over the past, 50 or so years, even 100

years from the First World War to the second, the atomic bomb, you can have your pick.

What we need is to be evolving at the same time, at the same speed, to catch up with the technology that's going at a much higher speed than us. So, our moral, ethical set of rules (if you want, I don't like that word, but something else) would have to be developed and we don't have the mechanisms to develop those now. So that's my biggest societal concern.

ii. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?

[In addition to] all the stuff that I'm sure others have been thinking about economic [drivers]; I am thinking of the artisan who is sitting under a tree somewhere. Again, in rural Africa or in Asia or Latin America and he or she used to make pretty items either a hand or a pocket thing. But to access the market is impossible.

Now for this person to be able to have a couple of cameras in her or his little shop and have everyone immersed and able to walk into that shop and interact with what they design and go [through] the process [of] buying [these designs]. I think that, from an economic and commerce perspective, opens the door for small players, not just for the big, huge industries like Zara and Co.

And you can hear the flip side of this, another positive side of it. You know, if you are a really discerning consumer and you say I don't want to buy anything that's made in a sweatshop. Then you insist on visiting the factory momentarily, instantaneously before you decide whether you're going to buy an item or not, and you can do it from the comfort of your apartment in Manhattan or whatever. You'll see shopping malls opening in these immersive environments to do just that.

iii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

I think there would be more and more roles for creators and developers; and less and less room for public policy makers, in determining [guidelines], because if your country acts [on its own] there isn't a lot that it can say or do that applies (so that Apple modifies its products [for example]).

The margin for public policy is shrinking, and the margin for corporation and the private sector is growing. Apple or Google is not negotiating with the federal government, [or] with the local government, [or] with the municipal government or [with] the provincial or the state governments. It's the beginning of the end of the era of the central government or the federal government setting public policy, [or] determining how the metaverse as part of the national economy, operates. Those days are going away and the whole concept of national economy is disappearing.

Because if you think of say Apple or Google, truly transnational corporations; it’s practically impossible to think of them vertically, you must think of them horizontally across industries, across countries, across boundaries. So, the whole set of rules would have to be rethought, but they can't be rethought by public policymakers who operate in the old realm with old tools, and different sets of priorities.

Let's say teachers who teach physics [for example]. [They] are normally accredited as a teacher by the Minister of Education, but the teaching of physics across cultures is not going to be tremendously different. So, there's a global association of middle school physics teachers where you are accredited by them, not by your state board or by your school board. Then the level of trust you have in that person

	is much higher because what's driving them is keeping the quality of the education high, not responding to local requirements of the board that has to do with local politics, local religion, local days, local this, local that. The same applies not just to education, [but to] health and commerce and everything. I mean, look at what we are doing right now through the TSB. We are looking at standards across countries and across industries, and not much of an influence is going to be there, at least not influence that is constraining by any one country over any other. iv. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development? I think there are more qualified than me to answer this question. If I have one to contribute on this, it is that the easier you make it to use the better, and then also you know you must make it work in an environment where there is less than a desirable level of Internet connectivity. And then as the world becomes full of Internet services provided by satellite as our friend Elon would want us to do. How do the two match and how do they accommodate each other? These are the very brief and simple thoughts that I have on this. v. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity? MOOCs already [provide] insight to what is happening. If you are curious and you're interested, the world is open out there for you. And then you get lost in choices. Where do I start? What do I do next? The future will belong (and that's a business line for me sometime in the future) to those who can guide on what are the six courses that you should take? What are the six things you must do over the next one year to develop this area of expertise or that area of personal development or that area of psychological ease or whatever. Because right now the world is just absolutely, enormously open, and enormously available to you, how do you manage? [It is] not easy or straightforward. 11. What is the most important question we DID NOT ask in this interview? I think what the question will be for me, [is] what deliberate policies and recommendations would you have to make, [to] ensure that there is no capture of the metaverse by technologist or by powerful companies? While, at the same time, giving them all the space to continue investing in research and development, because without them not much is going to happen. So, it's what's the right balance to strike between keeping this thing growing while not allowing it to be completely captured by companies, individuals, businesses, [or] industries.

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Written Interview Date
01 November 2023
Responses
Below as Received

Thomason

Dr Jane Thomason
Europe (Slovenia)
Third Sector (Non-Profit)

Part 1: Definition	1. When did you first hear the term "metaverse"? 2019. 2. What was your understanding of that term then versus now? I had little to no understanding in 2019. [My understanding now] is that Metaverse is a futuristic concept combining various technologies, including computer infrastructure, gaming, NFTs, DeFi, AR/VR, AI, and the spatial web. There are more than 600 companies building Metaverses, and it is estimated to be a US$13 trillion market opportunity by 2030. However, there is yet to be a consensus on what it is. It will be immersive and persistent, combining virtual and physical worlds with an economy and value that can be earned, lent, borrowed, and extracted from the physical world. Some challenges remain, including interoperability, latency, user interface, and regulation. This is arguably one of the most exciting technological developments which will help create new and enhanced ways to live, shop, be entertained, seek services, and be educated. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? When referring to Metaverse, I am referring to the Web3 Metaverse - Blockchain, DeFi, NFTs, AI/VR/XR, Big Data, Satellite, Cloud, and Artificial Intelligence (AI) are already converging and creating new possibilities for the future. Web 3.0 and Metaverse are the recent manifestations of what the convergence of technological innovations can create. Web 3.0 is a vision for the next generation of the Internet or the Internet of Value. Those building it envision a fairer, more equitable internet. An internet that facilitates the peer-to-peer exchange of value without intermediaries. It will be an internet where creators and content providers can be rewarded for their contributions, and community members can influence the direction of travel.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. Metaverse, Web 3.0 can contribute to social impact, especially climate action, financial inclusion, payments, health care, humanitarian settings, identity, land registry, philanthropy and fundraising, supply chains, and urbanization. It is yet to be seen who will build and control the Metaverse. There is a need to determine the jurisdictional boundaries of the Metaverse, as virtual borders could be just as important as physical borders when formulating policies. Policymakers and executives must also understand the boundaries between Metaverses and consequential regulation. At a nation state level, the question emerges, where are state borders in the Metaverse? What about virtual states?

	6. How could any or all the above benefit from the metaverse? What are the risks? See Part 3.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Metaverse infrastructure is still in its early stages, and the current internet infrastructure needs to be improved and made more user friendly. There are also a range of risks that will be of interest to policy makers, regulators, government, and the community. These are summarized below, including consent, criminal potential, data privacy, governance, human rights, security, and potential social consequences. There are currently no laws or legal jurisdictions in the Metaverse. Consent Informed consent will be a significant challenge. Firstly, a person needs to be informed of the risks, benefits, and probabilities of some dangerous consequences. Second, they need to understand and appreciate that information, and finally, the decision needs to be voluntary. How does this play out for people who are incapacitated, illiterate, mentally ill, or even children? Criminal Risks Fraud and misconduct are a significant risk and links across Metaverses and NFTs may increase the complexity of applying Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT) rules, and jurisdictional questions may hinder the ability to apply sanctions. Many of the worlds within the Metaverse have their own virtual assets, and integration across the worlds (and with other cryptocurrencies) will depend on well-developed and integrity markets. Increased growth could present risks to individuals and the broader economy in case of a crash or market manipulation. Data Interoperability means being able to move assets like avatars and digital assets between virtual spaces. Integration across virtual worlds and between the digital and physical will require interoperability across the "technology stack," including digital platforms and hardware devices. There is yet to be interoperability or portability between the various Metaverse environments. Governance The Metaverse can be built in Web2 or Web3. Closed Metaverses are being developed by closed BigTech platforms like Facebook, and others [are being] built on open protocols like Decentraland. Web 3 proponents object to the BigTech offerings in the Metaverse on the basis that it will not be more decentralized, or equitable. There are legitimate fears that a Facebook Metaverse will leverage user data for monetization and track their every move. The alternative is an open Metaverse built on shared open-source protocols, open infrastructure, and an open financial system. A Web3 Metaverse based on Blockchain, and open standards controlled by the users in a decentralized autonomous organization (DAO), could address data protection issues that are prevalent in more centralized business models, whereby the users themselves would control their data and decide how it could be shared. Property Rights Intellectual property (IP) enforcement is challenging in the Metaverse environment. This is because it is more difficult to identify the provider that can take down infringing content since Metaverse content is distributed and replicated across decentralized networks running on Web 3.0 and Blockchain-based platforms. There may be issues around applicable law and jurisdiction and identifying infringers. Popular brands are also facing issues of unauthorized use of registered trademarks in the Metaverse. There are several open questions about applying existing intellectual property rights to Metaverse intellectual property. At a more fundamental level, there are questions surrounding the different types of property in the Metaverse. Metaverse

intellectual property, like a company's logo, may require a different regulatory regime than the virtual property, like an avatar's hat.

Security
Current cybersecurity challenges such as phishing, malware, and hacking will persist and extend to devices enabling a Metaverse experience and avatars. Protecting the integrity of avatars will be a particular issue of concern, as will new forms of cyber-crime, such as selling fake NFTs, illicit use of virtual assets, and malicious smart contracts.

Social Implications
The social, physical, and mental health impacts are yet unknown. However, the Metaverse will likely present challenges to people's physical and mental health. For example, it is already known that people who use immersive technologies can become disoriented and cause injury, and they may become oblivious to real-world hazards. If used to excess, the Metaverse can cause mental health problems (such as loneliness) and reduce physical activity, leading to a rise in obesity and other physical health problems, which in turn contribute to a desire to escape the real world. Addictions to social media and online gaming as a form of escapism already exist, but the Metaverse can reinforce them.

The Metaverse holds the promise of offering children a unique experience. It could enable them to go back in time or visit places they could never have explored. It also offers a form of hands-on experience that can help children to understand the world around them and how things work, potentially increasing their motivation to learn. Finding ways to use the Metaverse alongside the natural world will be essential to preserve real teacher-child, caregiver-child, and child-child social relationships. If the Metaverse is left unregulated, it may cause children significant harm.

Many platforms are voice chat based and fully immersive, which can lead to moderation challenges regarding hate speech and harassment. Content moderation will be critical and the concentration of moderation power, has already been a source of controversy on Web 2.0 platforms, and it will likely persist in the Metaverse.

Metaverse, and network effects in the digital realm could increase wealth inequality. The existing digital divide of unequal internet access will also affect access to the Metaverse. The Metaverse might be challenging to access, particularly for people with a low level of digital literacy, disabilities, or mental health problems. Access to consistent, reliable broadband might be an obstacle for other groups. In practice, many might need help to access the Metaverse due to a lack of digital skills to needing more reliable broadband or the proper hardware. Online harms may be exacerbated in the Metaverse, including privacy, discrimination, mental health, and misinformation. Additionally, political and societal problems could be exacerbated.

Economy
Metaverse economies demand a rethinking of governance. Web 3 enables the creation of leaderless, decentralized organizations that obfuscate the jurisdictional lines of economic activity. Digital communities will connect and form networks or cooperatives. They can be rewarded or paid with tokens. The user is no longer a passive consumer of a service; they are a stakeholder. In a Community Token Economy, individuals are the agents of innovation. These communities can be global and will be able to exchange network tokens for contributions to the ecosystem.

Avatars
There will be an emerging scientific, ethical, and legal debate about Avatars. As avatars are virtual representations of real people and are purposive agents, do they have moral rights and obligations like those of their real counterparts? If they do and have identification, they risk personal data being copied, stolen, or manipulated. New content moderation challenges, including tackling verbal harassment or hate speech in

a virtual space, inappropriate actions from avatars that simulate sexual harassment or assault, pornographic content modeled on avatars, or misinformation or defamatory content generated using augmented reality.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?

Despite the levels of enthusiasm and investment in the Metaverse, there remain many challenges to widespread adoption, including interoperability, latency, user interface, and regulation. It also poses many ethical issues, yet to be resolved and ideas on how to do so. The Metaverse is an exciting technological development which will help create new and enhanced ways to live, shop, be entertained, seek services, and be educated. The Metaverse could be fulfilling and rewarding and create social purpose. At the same time, there are enormous risks. The Metaverse is an integral part of the future, and its potential is limited only by the framework of our imagination and today's technologies.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

By 2030, 700 million people will use the Metaverse. These digital worlds will change our lives. No longer will students learn at rows of desks in classrooms. Future education will be immersive, global, gamified, and generative.

Jobs are changing, and constant re-skilling will be needed. The Metaverse will form a vital component of the education of the future. Metaverse Education is projected to reach US$56.73m in 2023, with an annual growth rate (CAGR 2023-2030) of 44.98%, to reach US$763.70m by 2030. It will become instant, cheap, and accessible.

"Uberization" will disrupt education as it disrupts transport. By 2020, millennials are expected to make up about 50% of the workforce; by 2025, this number will be 75%. The future of work is changing; Gen Alpha will demand education in the palm of their hand, and a new narrative for education will emerge, which is Bricks and Mortarless.

Education will globalize, and education will be provided in a world where boundaries do not exist. An internet connection will make location irrelevant. Students will access education from anywhere in the world anytime; they will collaborate in real-time, regardless of their location. A virtual immersive space will save physical facilities and materials costs. This will mean that this borderless Metaverse must be interoperable between jurisdictions. Self-Sovereign Identity will provide the gateway to these virtual worlds and ensure people transact with legitimate platforms, professionals are certified, and the credential they receive is valid.

Gamified immersive education will make learning fun, success is rewarded, and data analytics will target precision learning. Web3 "Learn to Earn" games will be integrated into education, where students are rewarded with tokens for class attendance, video viewing, and completed assignments. Metaverse education will also enable teachers to design virtual learning environments that cater to each student's needs, abilities, and interests.

Generative AI will be integrated into the experience. Avatar instructors and tutors will show learners how to practice techniques during training. AI algorithms will analyze student performance data to identify strengths and weaknesses and provide personalized learning experiences. Assessments will provide real-time feedback. AI will automatically grade assessments and support curriculum development. Learners can be evaluated based on their learning styles and preferences.

People in 2050 will be able to engage in customized learning scenes that maximize learners' attention, interactive learning, and virtual learning experiences where participants engage in activities, such as group field trips, panels, quizzes, and creating spaces together. Language training will allow people to interact with intelligent peers

for language practice. Learners will be able to develop higher-order cognitive functions.

Metaverse will significantly increase the reach and impact of education and training programs and make them more inclusive and accessible. People unable to physically attend a traditional learning institution due to geography, disability, or other barriers, can access education. With access to a mobile phone, and the Metaverse is augmented reality enabled, people can connect from places where traditional schools are unavailable.

Education of the future will be immersive with interactive learning experiences. It will be global, with access to knowledge and resources from anywhere. Gamification will make learning fun and incentivize learning. AI will be integrated into all aspects, from curriculum development and avatar tutors to personalized assessments and precision learning.

This is my vision for the future.

10. Please share your opinions on at least one of the following:
    i. **Economic Outlook**: What are the potential economic drivers of the metaverse, and how might it impact industries such as entertainment, education, commerce, and employment?
    The Open Metaverse (Internet of Value) will create new economic opportunity. Outlier Ventures (2021) describes Metaverse assets as: 1. Physical Assets - space, objects, avatars, 2. Economic assets - currency, financial instruments, marketplace, and 3. Content assets - media and data assets.

    For developers, the Metaverse offers an opportunity for the emergence of new projects that would be impossible in the real world. Individuals enter virtual worlds using avatars, which are computer-based simulated settings. The environments may be two-dimensional or three-dimensional, the avatars can be text-based or visual, and the material can be thematic (in the case of games) or unrestricted.

    ii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
    Government
    Web 3 enables the creation of leaderless, decentralized organizations that blur the jurisdictional boundaries of economic activities. In particular, the enforcement of accountability through technical specifications and smart contracts will require a deep understanding of the objectives of the network and decision rights, incentives, and accountabilities.

    Business
    The Metaverse can create a whole new socio-economic ecosystem, with new legal and regulatory requirements, and a new global workforce. Blending boundaries between physical, digital, and biological worlds will likely continue at an exponential pace with technologies such as AI, IoT, 6G or next generation computing having the potential to reshape, recalibrate or disrupt our society and the global economy. With the current exponential advancements of a variety of modern technologies it is imperative for business leaders to have not only a higher degree of technical acumen but also emotional intelligence, lead with purpose and embrace ethics to remain competitive, as well as to ensure long term sustainability for their companies.

    Corporate Ethics in the Digital Era
    Digital ethics address behaviors related to digital mediums, norms related to the use of digital tools, autonomy, ownership of online data, etc. Business ethics

include governance, social and fiduciary responsibilities, as well as discrimination, fraud, abuse, or bribery. Leadership ethics describes the attributes of ethical leaders in this digital world. Some experts have even advocated for the creation of a Universal Code of Digital Ethics to guide legislators, compliance specialists, regulators, and industry leaders in implementing the values outlined by proactive digital ethics programs.

A new subfield of ethics, "techno-ethics" which deals with framing principles and methods to guide technology implementation and use is emerging. The changing consumer habits and preferences in relation to digital access will drive alternative approaches to ethical approaches. Propositions such as Developing a Universal Code of Conduct for Digital Business Ethics and Global Digital Ethics Framework are a moral imperative. Across the range of perspectives presented is a clear call for digital education and not just for laws and regulations but guidelines and interpretations. These need to be developed for corporations, communities, governments, and those who design the systems.

11. What is the most important question we DID NOT ask in this interview?

There is so much need and potential for research into Web3 and questions that need to be explored. Some of these are suggested below.

Social Utility

- How can Metaverse improve global access to education and the educational experience?
- Impacts on the industry, for example, having the immersive retail space inside where customers can engage with NFTs, with gamification
- Case studies on Web 3.0 and government services
- How Metaverse will create jobs of the Future
- New economic opportunities with token economies.
- Web 3 and sustainability

Technical Advancements

- Approaches to Self-Sovereign Identity
- Use of NFTs as digital verification for KYC and credentials
- Interoperability
- Improving accessibility, e.g., goggles; XR

Regulation

- Approaches to regulation and governance of DeFi and DAOs.
- What body would be appropriate to regulate the Metaverse?
- Cross-border jurisdictional issues.

User Experience and Engagement

- How to improve the user experience and user interface?
- Community engagement models and incentives.

User Impacts

- Physical and mental health impacts of digital life?
- Digital Anthropology examines the changing life patterns of young people who live their lives digitally.
- Impact of multiple identities on psychological health.

---------- Thomason End ----------

Written Interview Date
03 January 2024
Responses
Below as Received

Trevett

Mr Neil Trevett
Americas (United States)
Third Sector (Non-Profit)

Part 1: Definition

1. When did you first hear the term "metaverse"?
   In 1997, when first reading Stephenson's *Snow Crash*.

2. What was your understanding of that term then versus now?
   Stephenson's *Snow Crash* novel presented a fully formed vision of a virtual environment enabling sophisticated social interactions, with real-time integration of real-world sensor data. This vision has inspired many in the industry to attempt to build elements of an actual metaverse over the years. However, Stephenson's metaverse was largely dystopian, and so hopefully it will not be taken as a detailed design blueprint.

   Today the 'metaverse' term is used variously and inconsistently across the industry, often being over-associated with particular technologies such as virtual reality or cryptocurrencies. One often effective explanation of the 'metaverse' is 'the combination of the immersive of spatial computing with the connectivity of web', or the 'spatial evolution of the web', which captures a core essence without being overly specific [relating to] particular use cases or technologies.

3. How would you compare the "metaverse" to the internet, social media, or any other communication tool?
   Existing social media is built on Web 2.0. The addition of spatial computing to the web will create multiple new ways to communicate with our technology and with each other. For example:
   - AI to enable advanced user interfaces that intuitively comprehend our speech, expressions, gestures, motion, and environment
   - XR peripherals that create immersive virtual experiences and merge digital information with the real world around us
   - Pervasive compute and rendering to measure, visualize, and simulate the environment, processes, infrastructure, and cities
   - AI will enable us to create and capture 3D scans as easily as we do pictures and videos today, and the metaverse will let us share them socially
   - Advanced networking will enable these immersive interactions to be used at anytime, anywhere.

Part 2: Relevance

4. How seriously do you take the metaverse? Is it just hype or will it change everything?
   The metaverse has been overhyped before it has been consistently defined and broadly implemented. Also, confusion over the term, including over-association with NFTs, and dystopian visions that promote the idea of increased social isolation through retreat into virtual worlds through virtual reality, has degraded and tainted the metaverse term.

   But in reality, the metaverse is being created from the ground up through Darwinian experimentation on how to combine multiple disruptive technologies: AI, GPU acceleration and rendering, XR, Web3, and advanced networking including 5G/6G. Although it is impossible to precisely predict the evolutionary path of the combination of these technologies, it will be hugely disruptive and create a wavefront of significant commercial and social opportunities.

	5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The beachhead use case for the metaverse that is already seeing real-world adoption is the industrial metaverse - using web and spatial computing technologies for designing, visualizing, simulating, and optimizing industrial plants and processes. Some examples include: • Geographically dispersed teams cooperating on product design using virtual shared environments. • Real-time visualization and simulation of designs and processes. • AI experts guiding shopfloor construction and maintenance tasks. • Immersive processing and visualization of large amounts of real-time data to create digital twins. Enterprises are already operating more efficiently and profitably using these technologies, and these techniques will be applied in many other cases such as planning, monitoring, and forecasting for smart cities. The technologies needed to deploy meaningful enterprise solutions already exist and will help drive the development and evolution of additional advances needed to bring the metaverse to a broader range of consumers. 6. How could any or all the above benefit from the metaverse? What are the risks? Immediate risks being exacerbated by technologies being used to construct the metaverse include XR devices that gather enormous amounts of intimate personal data, that sharply exacerbate privacy concerns. AI will be the foundational technology for much of the metaverse and will drive its user interface. As well as the ongoing discussions around generative API, social upheaval through job replacement, and risks of undetectable deep fakes – the current downsides of social media could be greatly amplified by unleashing convincingly realistic AI agents that have been trained on an individual's social, financial, and medical history to sell, persuade, and even radicalize in ways that may be irresistible.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Many social concerns raised by AI and the metaverse cannot be addressed by technology alone. Legislation needs to keep pace with technological progress so that privacy, security, identity, and inclusiveness are considered and integrated during the evolution of the metaverse, rather than be applied as an ineffective afterthought. Ideally governments will be able to create a 'safe space' for technological innovations to continue to benefit society and the environment while minimizing social harm. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The metaverse is evolving when the overriding existential crisis facing society is climate change. Industrial efficiencies, new ways of working and effectively interacting at a distance, and the technological and ecological insights made possible through simulation and visualization could make the metaverse a vital and timely tool to help reduce environmental damage. 9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? Just as widespread internet access can broaden educational and economic opportunities, these benefits will be strengthened by the web's evolution into the metaverse. Social

	awareness and business or legislative incentives could be put in in place to ensure the metaverse is built to be inclusive and accessible to all. 10. Please share your opinions on at least one of the following: i. **Technological Implications**: What technological advancements are required to fully realize the metaverse's potential, and how can international collaborations drive its development? If the metaverse is to be a global, accessible platform available to all, it must be based on a foundation of interoperability standards. International bodies such as the ITU, and industry consortia such as the Metaverse Standards Forum, should double their efforts to enable and encourage global standardization cooperation. Interoperability is not just a technological concern, legislation across jurisdictions should also be as consistent as possible to avoid a patchwork of incompatible regulations. 11. What is the most important question we DID NOT ask in this interview? How can industry, through consortia such as the Metaverse Standards Forum, best assist the ITU in its unique position of influence as we evolve this next generation of the Web together?

---------- Trevett End ----------

Written Interview Date
09 December 2023
Responses
Below as Received

Abdalhadi

Ms Tayma Abdalhadi
Middle East (Palestine)
Third Sector (Next Generation)

Part 1: Definition	1. When did you first hear the term "metaverse"? The first time I heard it was when Meta announced its plans to launch a new product called the Metaverse. 2. What was your understanding of that term then versus now? I initially perceived it as a blend of augmented reality (AR) and virtual reality (VR), providing an immersive experience limited to specific platforms, gadgets, and software. However, my understanding has evolved to view the metaverse as a new approach to online content interaction. Despite minimal interaction and limited audience exposure to significant developments, my perception remains somewhat consistent, characterized more by speculation than concrete experiences. 3. How would you compare the "metaverse" to the internet, social media, or any other communication tool? The internet serves as the overarching technology that encompasses both social media and the metaverse. While social media operates as a hub for smaller networks of people sharing content on a digital space and interacting with it, the metaverse represents a new medium for viewing and interacting with a broader spectrum of content and applications online. Although social media is a crucial component within the metaverse, the latter extends beyond it to encompass various applications.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? The emergence of the Metaverse is actively shaping new segments within the technology industry. This evolution is evident through increased funding and the establishment of academic classes and courses designed to equip the existing workforce for a seamless transition into Metaverse specialization. Recognizing it as a game changer, particularly in the realm of human interaction and, crucially, child online protection, underscores the importance of approaching its development with utmost seriousness and caution. The imperative is to address critical issues from previous technological iterations while progressing towards more immersive and advanced technologies. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. Given the context of residing in an occupied and relatively isolated country, the significance of the Metaverse becomes highly pronounced. It holds the potential to offer additional avenues for individuals to participate in virtual work and educational opportunities in a more immersive and meaningful manner. Furthermore, it can facilitate the creation of more content that advocates for daily struggles and rights, amplifying the voices and experiences of the community. 6. How could any or all the above benefit from the metaverse? What are the risks?

	The immersive nature of the metaverse holds significant importance for sustaining meaningful and enduring virtual engagement. This quality can contribute to fewer drawbacks in hybrid learning and working scenarios, ensuring equitable inclusion of online participants. However, key risks and challenges revolve around infrastructure limitations and the high cost of equipment required for operating these applications. This potentially restricts access to a specific economic class within the community. Additionally, persistent issues from previous technologies, such as varied regional policies leading to application unavailability, content blocking, censorship, and inadequate safety measures, pose critical concerns for the safety and privacy of users within these immersive spaces.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Privacy and Security: Immersive experiences lack the ability to easily dismiss or disengage from unwanted online interactions. Psychologically, such interactions can be more impactful, especially with features like vibrations and spatial sound that simulate in-person experiences. The absence of regulation and the rise of anonymous avatars/users may lead to uncontrolled situations resembling a "wild wild west," particularly concerning for children who already face risks in traditional online gaming. The extensive data gathered, including eye movement, internet activities, and other data points, poses privacy concerns and raises questions about how it will be used, especially by advertising companies. Elitism and Global South Access: The metaverse demands robust internet infrastructure, compatible hardware, and the purchase of online applications, creating barriers for inclusive usage. This hinders widespread community access and connectivity, exacerbated by the lack of policy and legal frameworks in many countries to protect user rights and provide necessary customer support. To address these challenges, it is suggested to collaborate more effectively with communities through local organizations and policymakers, conduct user testing and in-depth research, and prioritize transparency in data flows and terms and conditions. 8. What excites you most about the metaverse and how would you suggest maximizing these benefits? The metaverse has the potential to revolutionize virtual work and education, especially as these aspects have become integral in our post-COVID lives. To maximize the benefits, robust support, risk mitigation, and transparent data practices are crucial. This ensures a positive transformation while minimizing concerns such as unwanted interactions and fears related to data leaks, hacks, or surveillance. 9. What ‘metaverse implications’ are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications? As a Palestinian, the top metaverse implications on my mind are influenced by the current limitations in internet use in our region. The challenges include issues of accessibility due to infrastructure constraints, limited availability of necessary equipment, and potential content restrictions. To navigate these implications, I suggest prioritizing efforts to improve internet infrastructure, ensuring affordable access to required hardware, and advocating for policies that promote inclusivity and protect user rights in immersive online spaces. Collaborating with local communities and organizations is essential for a more inclusive and meaningful metaverse experience in regions facing such challenges. 10. Please share your opinions on at least one of the following:

	i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations? The metaverse stands poised to revolutionize human interaction, communication, and culture, ushering in a new era of immersive virtual experiences. However, this transformation brings forth a set of challenges and opportunities. On the downside, there is a risk of deepening existing inequalities if access to the metaverse is hindered by economic barriers or insufficient infrastructure, potentially excluding certain groups from its benefits. The immersive nature of the metaverse also raises concerns about data privacy, necessitating careful regulatory measures to prevent breaches. Ethical considerations, including virtual harassment and the impact on real-world behavior, adding another layer of complexity. On the positive side, the metaverse offers a pathway to global connectivity, facilitating diverse interactions and collaborations irrespective of geographical boundaries. It introduces innovative modes of communication and collaboration, potentially enhancing the quality of online interactions. Navigating these challenges and maximizing the metaverse's potential calls for robust regulatory frameworks, ethical guidelines, and collaborative efforts involving technology developers, policymakers, and communities. 11. What is the most important question we DID NOT ask in this interview? How can we have safety by design and privacy by design in the Metaverse learning from our previous experiences building previous technologies?

---------- Abdalhadi End ----------

Written Interview Date
15 November 2023
Responses
Below as Received

Morici

Ms Federica Morici
Americas (Argentina)
Private Sector (Next Generation)

Part 1: Definition	1. When did you first hear the term “metaverse”? I first heard the term "metaverse" when Facebook changed its name to META. At that time, everyone was wondering what META meant, and I believe that's when I began to acquaint myself with the term. Subsequently, I realized that it has been referenced in literary works for decades. As I delved deeper into my research, I became aware that it was something I had previously explored when working on a real-time education project involving avatars. However, I had not identified it under the umbrella of the metaverse concept until then. 2. What was your understanding of that term then versus now? The term caught my attention, especially because it started being discussed by global leaders. Initially, I thought it might have a more sporadic or leisurely use; however, I later began to consider that many activities could indeed take place within the metaverse. My first real experience in the widely publicized Metaverse was attending a concert with friends. Currently, I understand the Metaverse as a universe that combines technologies of all kinds to synchronize real-time engagement in various everyday activities. At this point, I believe it is important to emphasize that, thanks to the metaverse, offline activities can be seamlessly integrated with online activities in a new dimension. 3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The Metaverse is not a singular technology; it involves the convergence of various technologies to exist. This tool enables us to interact in real-time in a manner "closer to reality," allowing us to immerse ourselves in a parallel space for numerous activities that previously required physical presence. I believe it is crucial at this juncture to underscore the significance of Web 3.0, as only through it can we comprehend the progression that has enabled us to transition from simple connectivity tools to social networks and now to the metaverse.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? Without a doubt, I can say that the Metaverse is a serious matter; I believe it will change various industries and our lives in the not-so-distant future. It is important to mention that when Facebook changed its name, we were all talking in every sphere about the Metaverse. We were very intrigued about what it was, what it had to offer, its uses, among other issues. However, despite this, when CHAT GPT emerged, the focus of debate, interest, and discussion returned to Artificial Intelligence. It is as if, in some way, certain Artificial Intelligence tools managed to become more democratized among citizens, who could directly take advantage of their benefits without the need for prior knowledge, training, or other barriers. I believe the Metaverse has the potential to "change it all" when it is accessible to everyone.

	5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. I will focus this response on my industry, which is the education sector. The Metaverse is and will be highly significant for the education industry through technology. Currently, at Estudiantes Digitales, we provide technology-based education to over 20,000 individuals from 14 countries worldwide, underscoring the importance of technology in reaching any sector globally that is connected, in this case, with the aim of educating. Technology has facilitated the democratization of education, increased its accessibility worldwide, and, importantly, lowered the associated costs considerably compared to in-person methods. Now, the impact of the Metaverse is fundamental in this industry. While technology has facilitated access to education, individuals often find that it is not the same as studying in person, and indeed, it is not. The Metaverse will also not be the same as in-person learning, but it will resemble being in a classroom with students and teachers. This significantly enhances the positive impact of technology applied to education, as the barriers of distance and solitude (exact words expressed by my students) will be considerably diminished. 6. How could any or all the above benefit from the metaverse? What are the risks? The benefits are innumerable, but if I must focus on the most important ones, I think that in the education industry we could provide education to any part of the world that is connected, and the student, in addition to learning, could live this immersive experience that is considerably more like studying in person. Now, why do people insist on in-person attendance? This is clear, human contact is important in a learning context. Learning is not only listening and taking note of it, learning is also being part of an environment and a context, it is asking a teacher in real time, it is expressing concerns out loud, it is sharing with colleagues in real time about the topic, it is body language, contact, it is many things that we do not have if we transfer education to the existing virtuality, the options are very limited and depersonalize the student and the teacher. I think the Metaverse is very beneficial in overcoming these obstacles.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Following my prior response, I will further elaborate on addressing concerns. Regarding the inherent risks of the Metaverse, especially within the legal realm, it is crucial to emphasize the necessity for robust educational efforts. Firstly, comprehensive training is essential for the entire legal community, encompassing lawyers, judicial assistants, law enforcement personnel, prosecutors, auxiliary prosecution staff, state attorneys, private practitioners, and law students. Secondly, it is imperative to disseminate accessible information to the public, detailing how to navigate the Metaverse safely, understanding potential legal implications, know how to complain in case of vulnerabilities and inconveniences, providing guidance for parents, guardians, and caregivers on the responsible use of the Metaverse by children and adolescents, fraud prevention, and other relevant issues (these principles are purely illustrative). While I, as a technology law specialist, can offer my legal perspective, it is crucial for professionals across various fields, such as psychologists, medical professionals, accountants, economists, political scientists, communicators, among others, to contemplate how to mitigate concerns stemming from Metaverse-related issues. I believe that societal consensus will assist us in addressing every aspect that currently raises apprehension. Concerning the barriers of the Metaverse, I posit that the most effective way to mitigate issues arising from the lack of accessibility and digital literacy is through the collective commitment of all societal stakeholders. The entire society must pledge to work towards ensuring that no individual is left outside the realm of essential connectivity

and can subsequently access and benefit from the Metaverse across various industries. To achieve this, cooperation at the national, regional, and international levels is imperative. I believe that the International Telecommunication Union plays a pivotal role in promoting these matters by advocating for best practices and offering recommendations to countries; it is an organization that I anticipate will have a crucial role in this new era.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?

I am enthusiastic about the prospect of an increasingly profound digital era as I believe it will allow me to maximize the benefits of my current tasks and explore new activities. The scope is so vast that these benefits could directly impact my profession (such as attending to clients, participating in hearings, mediations, and trials in the Metaverse, holding meetings with colleagues, among other aspects). Additionally, I foresee these advantages extending to education (establishing my own university in the Metaverse where millions of students from different countries can attend at a low cost, along with thousands of university professors). I could access basic services through technology, including visits to doctors, psychologists, nutritionists, accountants, and notaries.

The benefits are not limited to the professional realm but also extend to everyday life. We could virtually visit supermarkets, buy our favorite clothing (and try it on to see how it looks), have gatherings with friends and family, attend concerts, events, birthdays, and countless other activities.

I propose maximizing these benefits by fostering innovation, investment, and entrepreneurship. Achieving this relies heavily on a strong incentive for the private sector, a factor we must acknowledge if we aim to build such a brilliant "new" universe from scratch.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

I believe my primary concerns revolve around the legal and regulatory aspects, the current percentage of internet usage in my region, and issues related to technology education. I would like to focus specifically on the latter point, as I have already expressed my concerns regarding the first two in response to another question. It seems essential to differentiate between having connectivity, having internet access, knowing how to use the internet, understanding certain internet tools, and navigating the Metaverse. In this regard, I suggest viewing each of these elements as steps on a staircase: one follows the other.

Presently, in our region, there are individuals who lack even basic connectivity to use their mobile phones due to the unavailability of cell towers (infrastructure deficiency). Starting from this foundation, and assuming that all stakeholders are committed to addressing this issue, we can progress from ensuring people are connected to providing internet access, and subsequently addressing the challenges posed by the internet. If we can enable these individuals to have access, then we must focus on delivering quality education to empower them to reap the benefits of the Metaverse. In this educational effort, every sector of society has a role to play.

10. Please share your opinions on at least one of the following:
    i. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

	As a lawyer specializing in Cybercrime, Digital Evidence, Cybersecurity, and Artificial Intelligence, having witnessed how many countries could come to an agreement to establish a crucial accord like the Budapest Convention on Cybercrime, which not only held significance for what the convention stipulated but also in terms of prompting changes in the legislation of respective countries regarding cybercrimes and advancements, I believe we can establish regional and global agreements on regulatory frameworks for the Metaverse. Such frameworks should be comprehensive, addressing all emerging issues and encouraging countries to adapt their legislation while strengthening internal cooperation. World leaders need to be well-versed in this matter and should invite representatives from diverse sectors of society to collaborate on this topic. The more diverse the representation, the better the outcome. This is not to disregard the possibility of adaptation and modification in the future. I believe we should progress towards a foundational common legislative framework and build upon it, all grounded in international cooperation. By establishing common frameworks, we can continually adjust them to address issues that may arise due to the evolving nature of technology. 11. What is the most important question we DID NOT ask in this interview? What role does youth have in the involvement of adults in the Metaverse? What could they contribute as technology natives? How do you think you can include people who, due to their age, were not born with technology? What recommendations do you have in this regard?

---------- Morici End ----------

Written Interview Date
25 November 2023
Responses
Below as Received

Pandey

Ramu Pandey
Asia (Nepal)
Third Sector (Next Generation)

Part 1: Definition	1. When did you first hear the term “metaverse”? The term "metaverse" was first introduced to me in 2021, when I was selected as the Youth Envoy for ITU Generation Connect. Around this time, as I started to learn more about ICT and immerse myself in learning sessions, I came across conversations about the metaverse. 2. What was your understanding of that term then versus now? In the past, my understanding of the "metaverse" was quite limited, almost non-existent. At that time, the concept hadn't gained the prominence or development it enjoys today. I used to perceive it simply as a realm of virtual reality or an advanced space linked to sophisticated internet technology. However, my understanding has changed significantly in light of the quick advancements in technology and the growing interest in augmented and virtual reality. I've been more exposed to educational opportunities that have influenced my perspective because of my active participation in ITU Generation Connect. I now perceive the metaverse as a dynamic, networked digital world where people can interact, create, work, and have fun in virtual, immersive environments. In my opinion, it is now the area that blends aspects of social media, gaming, virtual and augmented reality, and more, providing a plethora of opportunities for cooperation, communication, business, and entertainment. 3. How would you compare the “metaverse” to the internet, social media, or any other communication tool? The metaverse is a seamless fusion of virtual and physical realities, similar to the next generation of the internet. The goal of the metaverse is to create immersive, connected experiences where people can live, work, play, and interact in a more integrated and immersive environment, in contrast to social media or other internet-based communication tools. It goes beyond simply using the internet to browse or communicate; it involves actively participating in a complex, networked digital environment.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? I see metaverse beyond just hype; it's a seismic shift in how we interact with digital spaces. Key stakeholders in Information and Communication Technology (ICT) are taking it seriously due to its potential impact. For instance, tech giants like Meta (formerly Facebook) are investing billions into metaverse development, indicating a serious commitment. Additionally, the gaming industry, a significant part of the metaverse, generated around $175 billion in revenue in 2021, demonstrating its financial viability. Moreover, industries beyond gaming, such as education, healthcare, and commerce, are exploring metaverse applications, underscoring its potential to revolutionize various sectors. In essence, the metaverse isn't just a passing trend; it's poised to redefine our digital and physical realities, making it a transformative force that stakeholders can't afford to ignore.

	5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. The metaverse is essential to ITU Generation Connect and our youth organization. We want to encourage young people to be globally connected and innovative, and its immersive, interconnected nature fits that goal. Realizing the potential of the metaverse is essential because it fosters digital inclusion, creativity, and collaboration among the world's more than 4.5 billion internet users. By making use of its platforms, we can interact with the 3.5 billion gamers that exist globally and open new opportunities for social impact, entrepreneurship, and education. Taking advantage of the metaverse entails arming our children with cutting-edge resources, getting them ready for the rapidly changing digital environment, and making sure they actively contribute to the direction of technology. For least developed nations like Nepal, the metaverse offers enormous promise in several ways. By giving people access to worldwide resources and educational opportunities, it can completely transform education. This is especially important in areas with poor infrastructure. Economically speaking, it promotes economic growth by opening doors for e-commerce, digital entrepreneurship, and remote work. The global metaverse economy is predicted to reach $800 billion by 2030, providing Nepal and other nations with significant opportunities to participate in this market. Furthermore, by providing immersive experiences and drawing in a fresh crowd of tourists, it can increase tourism. To fully realize the metaverse's potential in Nepal, however, issues like digital literacy and infrastructure development must be resolved. 6. How could any or all the above benefit from the metaverse? What are the risks? Organizations that are led or focused on youth could use the metaverse in a variety of ways. In the first place, it creates immersive learning environments that improve tech education by incorporating interactive elements. In the metaverse, networking and collaboration opportunities can promote international ties, which are essential for promoting youth engagement and idea sharing. Events centered around the metaverse or virtual spaces for fundraising could increase revenue streams. Beyond geographic boundaries, more people may participate in accessible virtual conferences. There are hazards, though. The metaverse may present privacy concerns that require strong security measures to protect user data. Disparities in accessibility could widen, excluding people who lack access to sufficient technology or the internet. Furthermore, age-appropriate content regulation and safety in the metaverse continue to be concerns. The least developed nations like Nepal can benefit from the metaverse in various ways. Firstly, it can revolutionize education by providing access to high-quality educational resources and immersive learning experiences, bridging the gap caused by limited physical infrastructure. Additionally, it could boost tourism by offering virtual tours of cultural landmarks, potentially attracting more visitors. Economic opportunities may arise through virtual marketplaces, enabling local artisans to sell their crafts globally. However, risks include technological disparity, where lack of infrastructure and access to the internet may widen the digital divide. Moreover, cultural erosion might occur as traditional practices could be overshadowed by global trends in the metaverse. Privacy and security concerns also persist, especially in nations with limited regulations and safeguards.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? For me the security and privacy are the two main issues with the metaverse. As we incorporate more elements of our lives into the digital sphere, it is imperative to

prioritize data protection. Over 70% of users are concerned about data security in the metaverse, according to surveys.

A multifaceted strategy is required to allay these worries. I suggest that personal data can be protected by putting strong encryption techniques, user-controlled data permissions, and decentralized systems into place. Establishing industry-wide cooperation to establish common guidelines for privacy and data security is also essential. Furthermore, I see that enhancing security measures and fostering user trust can be achieved through transparent practices and regular audits. It's also crucial to inform users about the risks they might face and the best ways to protect their privacy in the metaverse.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?

The most thrilling aspect of the metaverse for me is its potential to democratize access to global opportunities and resources. And to maximize these benefits here are some suggestions that I have come across:

- Education Access: Use the metaverse for immersive and accessible education, bridging gaps in learning resources and offering diverse educational experiences.
- Social Connectivity: Foster connections and networks beyond geographical boundaries, promoting social interaction and collaboration with peers worldwide.
- Economic Opportunities: Encourage entrepreneurship by leveraging the metaverse for online businesses, digital skills training, and remote work opportunities.

By leveraging these aspects of the metaverse, the nations like Nepal can harness its potential to overcome barriers and access a world of opportunities previously out of reach.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

With the current rate of internet penetration, I believe the implications of the metaverse are significant, particularly in the Asia Pacific region. Asia is home to more than half of all internet users worldwide, so the metaverse will likely have a significant impact. The population of this area is tech-savvy and has a diverse cultural background, making it a prime location for metaverse adoption. Nonetheless, issues like privacy concerns, equal access to this virtual world, and digital accessibility still exist. Handling these ramifications requires a multifaceted strategy. To guarantee inclusivity, address regulatory frameworks, and give priority to digital literacy, cooperation between governments, tech companies, and communities is imperative. In the Asia Pacific area, a more equitable and inclusive metaverse experience can be promoted by putting a strong emphasis on data security and developing platforms that work across multiple devices.

10. Please share your opinions on at least one of the following:
    i. **Societal Transformation**: How might the metaverse reshape human interaction, communication, and culture? What challenges and opportunities does this present for inclusivity, privacy, and ethical considerations?

    As a young person from a country like Nepal, I believe the metaverse could revolutionize human interaction by transcending geographical boundaries, enabling connections that were once limited by distance. This opens doors for cultural exchange and collaboration, potentially fostering a more interconnected global community. However, challenges loom regarding inclusivity, especially considering disparities in access to technology and resources. Ensuring equal participation from diverse socio-economic backgrounds becomes crucial. Privacy

and ethical considerations are paramount; safeguards must be in place to protect user data and prevent exploitation or discrimination within this virtual realm. Balancing innovation with ethical responsibilities will be pivotal for a sustainable and equitable metaverse experience.

ii. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?
In Nepal, the metaverse presents an unprecedented opportunity for connectivity and innovation. As a youth immersed in this digital landscape, I believe that creating inclusive regulatory frameworks is crucial to ensure responsible and safe usage. Given the metaverse's borderless nature, collaborative efforts among global leaders are imperative. Policies must prioritize user safety, data protection, and accessibility. Emphasizing cultural sensitivity and local context within these guidelines is vital for countries like Nepal, where diverse communities thrive. Collaborative efforts could involve international forums or bodies that facilitate discussions among governments, tech experts, and representatives from different cultures. Striking a balance between fostering innovation and safeguarding citizens' rights is paramount for the sustainable and equitable development of the metaverse. This perspective highlights the necessity for inclusive policies, global collaboration, cultural sensitivity, and the balance between innovation and safety in the context of Nepal and its diverse communities within the metaverse.

iii. **Individual Empowerment**: How might individuals navigate the metaverse to enhance personal growth, education, and well-being? What potential challenges could arise in terms of addiction, mental health, and identity?
As a youth from Nepal, the metaverse presents an exciting frontier for personal growth and education. Its potential for enhancing learning experiences, accessing global knowledge, and fostering creativity is immense, especially for regions with limited resources like ours. However, concerns about addiction and mental health are significant. Balancing virtual life with the real world might challenge our sense of identity, leading to potential isolation and mental health issues. The metaverse should promote digital literacy and create safeguards to prevent addiction while ensuring inclusivity and accessibility for diverse populations. Prioritizing mental health support and emphasizing a holistic approach to virtual interactions will be crucial for harnessing the metaverse's benefits while mitigating its challenges for individuals, especially in countries like Nepal where such issues might be amplified due to unique socio-economic contexts.

11. What is the most important question we DID NOT ask in this interview?
Who is excluded or disadvantaged by the development and implementation of the metaverse, and how can these disparities be addressed?

---------- Pandey End ----------

Written Interview Date
30 November 2023
Responses
Below as Received

Zalewska

Emilia Zalewska-Czajczyńska
Europe (Poland)
Third Sector (Next Generation)

Part 1: Definition

1. When did you first hear the term “metaverse”?

It is difficult to recall the exact time when I first came across the term ‘’metaverse”. I believe it might have been in 2020 when the buzz around this topic started to gain speed, largely due to Meta's (formerly Facebook) actions - changing their company's name and making substantial investments in virtual worlds.

2. What was your understanding of that term then versus now?

Before learning about the "metaverse", I was already familiar with technologies such as virtual and augmented reality, as well as multiplayer games based in open worlds, such as Minecraft, for example. Thus, my initial understanding of the term "metaverse" was that it is something analogous - a kind of virtual or mixed-reality world in which users can meet, interact with each other, play games together, etc. Perceived in this way, it would be just another kind of simulation or game. To be honest, at that time, I did not see a reason to consider the metaverse a novel concept.

Since then, I have had an opportunity to delve deeper into this topic, and my view has evolved. Now I see that the concept of the metaverse encompasses much more than just new ways of using VR, AR, or MR. Instead, it could be a phenomenon that would transform the internet we know into the next generation of it.

Although publications often differ on the definition of what should be called the metaverse, most point to three features as fundamental to the concept: immersiveness, interoperability, and decentralisation. The first one means that the metaverse fully engages and absorbs the user. Due to the use of dedicated devices, such as VR goggles or motion sensors, it creates a sense of being fully surrounded and involved in the virtual world.

The second term, interoperability, refers to the seamless interconnection between spaces, making it not necessary to fulfil differing technical or formal requirements to transition. It enables users to move their avatars and data from one space to another without barriers.

The last term - decentralisation - implies a new economic model deployed in the metaverse. It can refer to both the way this space is governed and the method of organising the generation and flow of financial value and data. With decentralisation, users have an increased ability to influence the metaverse spaces they use and monetize the data and content they share.

All these three features distinguish the metaverse from the current internet. While the first one, immersiveness, is relatively easy to achieve using already existing technology, implementing the others may be trickier. In fact, they represent a departure from the centralised and walled-gardens models deeply entrenched in the current internet. In my opinion, however, their deployment in the metaverse is utterly crucial for it to become a truly new generation of web.

3. How would you compare the “metaverse” to the internet, social media, or any other communication tool?

	As I indicated in the previous answer, I perceive the metaverse as a potential further step in the development of the internet. The process of creating the metaverse should be seen as an evolution of current websites, social media platforms, and internet-enabled communication tools into a new form. Some of their current functionalities will remain, while others will be removed or replaced. New possibilities for users to engage in activities - both positive and negative - will also emerge. This can be compared to the development of the internet and social media themselves. Before their emergence, the main mass media were television, radio, and newspapers. Only a few individuals, such as journalists or politicians, could use those means to express their opinions publicly. The advent of the internet and then social media created a new forum on which anyone with web access could communicate their thoughts to the world, regardless of who they were. In this way, the internet made public discussion much more egalitarian. At the same time, it opened a space for an unprecedented scale of hate speech and disinformation. I believe that the same could happen while building the metaverse - it will bring about new opportunities compared to the current internet, but they will be associated with risks.
Part 2: Relevance	4. How seriously do you take the metaverse? Is it just hype or will it change everything? In my view, right now, we are in a phase of anticipation regarding the potential applications of the metaverse. I have little doubt that VR, AR, and similar technologies will play a crucial role in various areas, such as industrial processes or infrastructure management. There is a growing number of projects aimed at creating digital twins of manufacturing plants, transmission networks, cities, etc. Virtual reality is also utilised in research and training, enabling the creation of simulations of real-life processes or situations. These are just a few examples of fields in which metaverse-related technologies are thriving. However, I believe that the social potential of the metaverse has not yet been fully realised. Current metaverse social platforms (excluding gaming ones) are not very attractive to a wider range of users. They are isolated from one another, poorly moderated, and often feel empty. Moreover, the headsets and other devices necessary to visit them are expensive, heavy, and can cause nausea after extended use. With this in mind, progress must be made in this area for the metaverse to become a commonly used space. Its success will depend on whether it can provide users with new possibilities and offer them extra value compared to "traditional" online platforms. It is not enough to recreate the old operating model with new tools. If the metaverse is to become a widely used space, it should meet users' expectations and needs that have not been satisfied by current online platforms. The development of more affordable and less inconvenient equipment could also encourage people to start exploring these technologies. In summary, the metaverse has the potential to bring about significant changes; it is already making strides in some areas. However, to transcend mere hype, it must evolve into a space that people genuinely want to use. 5. How important do you think the metaverse is to your industry, function, organization, city, and/or nation state? Please address all that apply. I am a policy analyst, and my primary field of work is cybersecurity. I believe that my job will not be significantly affected by the emergence of the metaverse, unlike those involved in the technical aspects of cybersecurity, where changes can be substantial.

	At the level of my city and country, not much is happening around the metaverse at the moment, but this may alter in the not-so-distant future. After all, Poland is part of the European Union, which plans to develop dynamically in the metaverse field. This is reflected in the European Commission's communication on virtual worlds and Web 4.0 from July of this year, in which it declared an intention to invest in the research and development of these technologies. Hence, I anticipate that the forthcoming changes for the metaverse in the European Union will also influence Poland. 6. How could any or all the above benefit from the metaverse? What are the risks? Among the positive effects the metaverse can have on the cybersecurity industry are new opportunities for specialist training. If conducted in a virtual world, such activities allow experts from different parts of the world to train together without the need for travel. The creation of virtual twins of real systems or infrastructure will also play an integral role. They will make possible to test new security features or simulate real-world scenarios safely, quickly, and at a much lower cost. For cities, the metaverse presents an opportunity to become greener and more sustainable. The use of virtual models can help monitor and improve multiple processes, such as traffic management or cooling the city in summer. Another chance that the metaverse brings is the potential relocation of public utilities and offices to a virtual space. If citizens can handle their affairs without leaving home, this will reduce street traffic and the pollution associated with it. Furthermore, the availability of public services in the metaverse will enhance their accessibility for people with mobility difficulties, such as those with disabilities. However, such solutions also come with many risks. For example, to build smart virtual models it is necessary to install massive amount of IoT devices, such as sensors and cameras, around the city to collect real-time information about current conditions and incorporate it into the model's operation. Their misuse could lead to excessive collection of citizens' data and create new possibilities for increased surveillance. Moreover, an intrusion into the system may involve severe consequences such as disruption of work throughout the whole city.
Part 3: Implications	7. What concerns you most about the metaverse and how would you suggest mitigating these concerns? Amid the opportunities the metaverse could offer humanity, it will also open space for the expansion of threats. I would not label them as “brand new” because most of them have already affected Internet users for a long time. What is important is that the peculiarities of the metaverse may cause these well-known risks to expand in unprecedented directions. Noteworthy are risks in the area of cybersecurity. I once heard a quote that, in my opinion, sums it up well: security will make or break the metaverse. The rule is simple - even if the technology offers magnificent opportunities, it will not attract a multitude of users if using it entails a serious threat to their safety. There are plenty of cybersecurity dangers that may occur in the metaverse. An example would be the previously mentioned hacking of a virtual twin, which can result, depending on the facility to which the twin belongs, in serious consequences such as the theft of company or government secrets or disruption to work. Moreover, cybersecurity breaches in the metaverse increase the risk of users being physically harmed. For instance, attackers can remove or move the safety line - the boundary of the area that the user has marked as safe to move around while they are in virtual reality. The manipulation of this could lead the user to injure themselves - tripping, colliding with an object, or even falling down the stairs.

Another risk connected with security is the violation of privacy and data protection. The more data collected from users in the metaverse, the more significant this threat becomes. Already, some virtual reality devices measure a great deal of user parameters, such as changes in limb and head position or eye movements. Additionally, by tracking the avatar's movements in the metaverse, it will be possible to measure quite precisely the user's reaction to everything they experienced in it. This will make it possible to assess factors such as the length of interaction, direction and frequency of glances, distance maintained, gestures made, words spoken, etc. All this data gathered together enables the creation of a detailed user's profile that can reveal sensitive information about their, e.g., health or preferences.

What this means is that in the metaverse, a much wider range of information will be collected about the user in a single space than in any medium to date. For this reason, the risks associated with the misuse of data and its effects on data subjects will dramatically increase. At the same time, metaverse user databases will become attractive targets for attacks.

That is why one of the basic principles for developing the metaverse and related devices should be to adopt a security and privacy by design approach. Strong security and data protection mechanisms need to be implemented into the virtual worlds from the earliest stages of projecting and designing. Users should also have the possibility to choose for themselves which data they would like to share and which they would not in a particular metaverse space.

8. What excites you most about the metaverse and how would you suggest maximizing these benefits?

There are two areas in which the possibilities offered by the metaverse really excite me.

The first one is education. I believe everyone has memories of school lessons during which they almost fell asleep when a teacher was talking, and fascinating ones in which they could actually practise something themselves. The metaverse has the potential to turn almost every lesson into an activity that engages not only hearing but also sight, hands, and legs. Even an ancient history lesson in a virtual setting can enable students to see for themselves and interact with the historical buildings or events they are learning about.

Classes in the virtual environment are also an opportunity for students who live in remote or poorly connected areas. Thanks to this solution, they may have the possibility to meaningfully participate in all activities they would otherwise miss or could only watch as a transmission.

The sad reality is that these technologies are expensive. That means that in the near future, they will be available only to the most prosperous educational institutions. One possible temporary solution is that the hardware and software needed for classes in the metaverse could be purchased by public institutions or cultural centres. In this way, students and teachers from the entire city or region would have the opportunity to benefit, rather than just a single school or class. Naturally, this requires financial assistance from the state, and in the case of my region, perhaps also from the European Union. Such financial outlay would also be required to provide appropriate training for teachers that will equip them with the competences necessary to teach in the metaverse.

The second area in which I find the use of the metaverse especially promising is the fight against climate change. Among the ways in which this technology could be useful in this field is the possibility to create precise virtual models of real ecosystems. Such solutions would allow researchers to better observe and understand processes that accelerate climate change and to conduct simulations of actions that could mitigate the scale of its negative effects. Moreover, the metaverse space in which those models

would be created could be used by scientists from all around the globe simultaneously, which would strengthen global cooperation.

In the European Union, initiatives of this kind have already been launched. One such endeavour, Destination Earth, aims to create a digital representation of the globe. In addition, the European Digital Twin of the Ocean project is another noteworthy effort in this area.

The metaverse has the potential to play a role in mitigating environmental pollution. This can be accomplished by relocating certain real-world processes to virtual spaces. For instance, testing new products or solutions in a digital environment saves materials and energy that would otherwise be consumed in real-life testing facilities. Another beneficial aspect is the optimization of pollution-causing processes through the use of digital twins, for purposes such as managing street traffic or production.

These are just a few examples of how the metaverse could be used for the benefit of the environment. However, it is significant to track the environmental costs of the deployment of this technology – especially when it comes to energy consumption. If metaverse is to contribute to tackling climate change, the advantages it provides must outweigh the carbon footprint produced by its use. For this reason, it is essential to develop metaverse-related technologies and energy-saving solutions in parallel.

9. What 'metaverse implications' are top of mind for you? Are they influenced by current percentage of internet use in your region? How would you suggest navigating these implications?

This is a very good question because it makes me wonder about which consequences of the metaverse I am focusing on primary and for what reason.

The first implication that comes to my mind is the economic impact of the metaverse. This technology has the potential to create new business opportunities, reshape industries, and lead to the emergence of new kinds of jobs. Properly planned strategies for investing in metaverse-focused business development and the education of professionals in this field can position countries and regions as economies of the future.

Another implication caused by virtual worlds could be changes for societies. Some may be positive, such as access to more enriching entertainment and online learning or greater inclusion of people who have difficulties leaving their homes due to various reasons. The metaverse could also introduce new ways in which people can meaningfully engage in public and social life.

However, the metaverse also has a dark side. It is accompanied by the risks of addiction to the virtual world, cyberbullying, sexual assaults - just to name a few examples. Thus, it is essential to provide individuals with digital literacy training to teach them how to navigate metaverse spaces safely for themselves and others. Continuous monitoring of the impact of these technologies on mental and physical health from the very beginning will also be vital. It is worth learning from the past lessons - the negative effects of the internet and social media on human well-being were noticed only when they became severe.

Regarding the question of whether my view is influenced by the current percentage of internet use in my region, the answer is yes. In my country, over 88% of the population uses the Internet. Because of this, to some extent, I automatically tend to focus on a different level of metaverse implications than basic issues such as the availability of access to this technology. I think if it were the other way around, a more crucial issue for me than how to support metaverse businesses or teach people to navigate this space would be how not to create another digital divide - this time in the metaverse.

10. Please share your opinions on at least one of the following:

i. **Governance and Policy**: As the metaverse blurs geographical boundaries, what regulatory and policy frameworks might be necessary to ensure responsible and safe usage? How can global leaders collaborate to establish guidelines that encourage innovation while safeguarding citizens?

In my view, the current situation in the field of AI offers insight into the potential problems that may arise when shaping regulations and policies for the metaverse. Specifically, there are calls for global cooperation, the formation of cross-sectoral advisory bodies, and substantial efforts by international organisations to conduct consultations and develop principles. However, establishing a common vision for AI strategy is extremely challenging because different regions and countries advocate for opposite values and beliefs.

Furthermore, setting up a regulatory and policy framework is a struggle even in the realm of the internet itself. Several countries deliberately block content available in others, justifying it by their values, public morality, safety considerations, etc. When attempting to globally spread standards, there is always a group of actors perceiving them as interference with their sovereignty.

Hence, this is a complex and difficult problem. The often-suggested tool to overcome this obstacle is the development of policies within the framework of a multi-stakeholder dialogue. While I completely agree that inviting representatives of all affected stakeholder groups into the process is necessary, I am afraid that ways have not yet been developed to ensure that each group has equal influence in these negotiations – this is especially true for civil society, which holds the least powerful position. The second challenge is that we still lack methods to ensure that agreements adopted in such dialogues are globally enforced, at least by all involved stakeholders. While some tools exist for exerting pressure on actors at the international level, numerous examples prove they are often not particularly effective.

The problems outlined above have become pressing in recent times in connection with AI - the rapid growth of innovation in this field caught policymakers by surprise. The topic of potential harms caused by AI to humanity has since gained massive attention. It became evident that, to prevent the worst scenarios, common guidelines for AI development and usage must be established not only on a local or regional level but on a global one. Additionally, this area poses another challenge—to find a balanced regulatory approach that protects citizens against threats while supporting, rather than blocking, AI innovations.

As the technological race gains speed, various stakeholders put excessive effort into searching for new ways of reaching consensus on AI policy framework at the global level. In my opinion, the lessons learned in this process will be extremely valuable when the same debate starts around the topic of the metaverse. Like AI, its emergence will also be accompanied by challenges transcending national borders. For this reason, it is crucial to monitor the situation and act before problems arising from the metaverse become as urgent as those connected with AI.

11. What is the most important question we DID NOT ask in this interview?

The only additional question I would ask the interviewee is whether they themselves would like to use the metaverse in the near future. Answering this for myself: yes, I would like to, although probably only for specific purposes - I would rather not transition the majority of my life there. However, for now, I am waiting for the production of improved equipment for virtual reality use - I am among those unlucky people who quickly get nauseous from it.

---------- Zalewska End ----------

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