THE METAVERSE AND HUMAN RIGHTS

Norges institusjon for menneskerettigheter

Teknologirådet

INTRODUCTION

When Facebook changed its name to Meta in 2021, it gave new life to a concept known from science fiction. The Metaverse is the vision of a sensory and immersive virtual universe that will connect social media, games and 3D graphics. Tech companies invest heavily in the technology and, if we are to believe the research company Gartner, one in four people will spend at least one hour a day in the Metaverse by 2026.

This report is the result of a collaboration between the Norwegian Board of Technology and the Norwegian National Human Rights Institution (NIM). Both agencies are tasked with advising the Norwegian parliament (Storting) and other authorities, as well as providing information to the general public. The two institutions also experience significant thematic cross-over. Technology, law, ethics and policy are almost always closely intertwined.

Our shared ambition is to identify what the Metaverse is and what it may become, as well as what this could entail for people, society, politics and human rights. Technology develops at the speed of light, yet policies continue to lag behind. Although it remains uncertain what shape the Metaverse will take tomorrow, its potential implications for human rights should be discussed today. We hope that this report will stimulate discussions about the next generation of the internet and human rights in a virtual reality.

We would like to thank our great colleagues for their excellent work while navigating new and uncharted territory. Project Manager Hanne Sofie Lindahl has been responsible for the contribution from the Norwegian Board of Technology, while Cecilie Hellestveit and Mathilde Wilhelmsen have contributed on behalf of NIM.

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Tore Tennøe
Director
Norwegian Board of Technology

Adele Matheson Mestad
Director
Norwegian National
Human Rights Institution

CONTENT

THE METAVERSE VISION

The Metaverse is the vision of a sensory and immersive internet that will connect social media, games and 3D graphics. Instead of browsing the internet, the Metaverse will give us the sensation of being fully immersed within virtual realms.

FROM VISION TO REALITY

The vision of the Metaverse is not new. Parallel virtual worlds have been described by technologists, philosophers and science fiction authors for many decades.

The term "Metaverse" originates from the science fiction novel *Snow Crash,* written by Neal Stephenson in 1992. In the novel, the Metaverse acts as an escape from a dystopian USA where people sought refuge in a virtual reality consisting of avatars (3D models of people) using VR headsets.

However, the current ambition for the Metaverse is not to replace the physical world, but rather to bring the virtual and physical worlds closer together. Many companies are currently competing to build the virtual universe of the future.

HYPE AND REALITY

The Metaverse gained new relevance in October 2021 when Mark Zuckerberg announced that Facebook would change its name to Meta.[1] Meta's vision is for the Metaverse to become the next generation of the internet. The goal is to create new and more virtual ways to connect people and services. Despite facing financial challenges, Meta intends to invest USD 10 billion in the Metaverse each year going forward.[2]

Other companies, such as Microsoft, Apple, Google, Amazon and Sony are also investing significant amounts in technology that could make the Metaverse possible. McKinsey estimates that the Metaverse will be worth $5 trillion by 2030.[3]

Several companies could become key players in the development of the Metaverse. Two examples include Epic Games, which developed the popular online game Fortnite and the graphics card manufacturer Nvidia. Asian companies are also investing in the Metaverse. In 2021, the Chinese company Tencent launched its own version of the Metaverse – "Hyper Digital Reality". South

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[1] Meta (2021)
[2] Kastrenakes, Jacob and Alex Heath (2021)
[3] McKinsey & Company (2022)

Korea has created "the South Korean Metaverse Alliance", which consists of no fewer than 450 technology companies.[4]

VISIONS OF THE FUTURE

Tech companies have vested interests in describing the Metaverse in line with their own perception of the future and the products they develop and produce.[5] The vision for the Metaverse therefore varies depending on who you ask. Nevertheless, some aspects recur in most visions of the future: the Metaverse will connect gaming and social interaction and remove physical limitations.

The Metaverse is often associated with gaming. Today, multiple players can play online games simultaneously and collaborate to solve various tasks in virtual universes. Either in the form of a look-alike avatar, or as a game character of their choosing. However, the vision for the Metaverse includes more than just interactive virtual gaming experiences.

There are many examples of what *could* become possible in the Metaverse: Going to the cinema, attending lectures and conferences, viewing real estate, exercising, meditation and social interactions. In the healthcare sector, for example, it could become possible to plan and simulate surgical interventions and to offer virtual treatments such as physiotherapy and mental health services.

The vision also entails removing physical limitations. Instead of scrolling through social media on your smartphone, the content could appear in your surroundings. It may even become almost pointless to draw a categorical distinction between the physical and the virtual world.[6]

The Metaverse is also a vision of a 3D version of the internet, allowing for immersive and virtual experiences. Perhaps we will perceive it as a further development or evolution of the current internet. We may not even refer to it as the "Metaverse" if and when the technology is commercialised and adopted.

[4] Stella, Marloes Valentina (2022)
[4] Tencent (2021); Kim, Sang (2021)
[5] Ball, Matthew (2022)
[6] Hesseldahl, Peter (2022)

In summary, we can say that the vision for the Metaverse is not tied to a specific idea, technology or company. Nevertheless, the Metaverse representants a new way for people to use (and take part in) digital services and platforms.[7]

WHAT IS THE METAVERSE?

There are many different definitions of what the Metaverse is and what it will become. Nevertheless, there are some specific characteristics that distinguish the Metaverse from today's internet and existing virtual worlds.

Matthew Ball, author of the book "The Metaverse and How it Will Revolutionize Everything", defines the Metaverse as follows:

> "A massively scaled and interoperable network of real-time rendered 3D virtual worlds that can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments."[8]

Three distinct features can be used to describe the Metaverse:[9]

- **Presence:** The Metaverse is set to invoke a sense of actual physical presence in fully fledged virtual worlds. It will consist of different (and perhaps numerous) virtual environments, both fantasy universes and also so-called mirror worlds – worlds that are similar to our own. A sense of presence will be achieved by connecting our senses online. Being able to see, hear, perceive movements and touch and feel (virtual) objects are therefore some of the key features of the Metaverse. Presence can be experienced through VR headsets and haptic devices, such as gloves with touch sensors, but this is not necessarily a prerequisite (see subchapter "Presence").

- **Coherence:** Current virtual platforms and existing online games are largely closed universes. However, the virtual worlds of the Metaverse will be interconnected. Your digital representation, whether an avatar or a hologram, should be able to move seamlessly between different universes

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[7] Ravenscraft, Eric (2021)
[8] Ball, Matthew (2022)
[9] See also the characteristics described in Dionisio, J.D. N. et al., (2013)

and services. It should also be possible to transfer 3D objects and models between different services, using data portability. Ideally, the universes would be interlinked through a virtual economy.

- **Simultaneity:** The Metaverse will connect people and must have sufficient capacity for an unlimited number of people to use the Metaverse continuously and simultaneously. Bandwidth, latency and computing power will be key in achieving this. No virtual universes currently have the computing power or network capacity to facilitate such usage.

THE METAVERSE TODAY

Today, virtual worlds are often referred to as the "Metaverse" although they do not meet all the characteristics described in the previous chapter. Current virtual worlds are largely closed universes and not interconnected. Existing virtual worlds may be perceived as more or less immersive through VR headsets, but most of these platforms can also be accessed through web pages and apps. These virtual worlds have limited capacity, and both user-friendliness and popularity vary. Nevertheless, they can be viewed as prototypes or beta versions of the Metaverse, and they provide us with some insights as to what the Metaverse could look like in the future.

GAME-BASED WORLDS

Currently, the most popular virtual worlds are gaming platforms. These have several characteristics that are similar to the Metaverse. Through gaming platforms people can play games, interact with others and create content simultaneously. Several games also have their own economic systems, including in-game currencies and a set of rules for using such currency and related payment solutions. Most platforms can be accessed without specific VR devices.

They differ from the vision for the Metaverse in so far that they are not interconnected with other virtual worlds and because they have limited capacity. This means that it is not generally possible to move yourself (your avatar), your assets and your history from one gaming platform to another.

Minecraft
Minecraft is an online computer game developed by the Swedish gaming company Mojang. The game has more than 90 million monthly users. The objective

of the game is to build structures, houses and tools consisting of LEGO-like cubes or bricks. The game can be played alone or together with multiple players simultaneously and supports various modes – from creative mode where you build structures to survival mode where you fight monsters and zombies. The game can be played on a tablet, PC or a smartphone, and the graphics are relatively simple. Minecraft was one of the very first online games to adopt its own economic system in which players can trade virtual objects with one another.[10]

Fortnite
Fortnite, developed by Epic Games, is one of the largest online gaming platforms in the world. It now has nearly 83 million monthly players.[11] The online survival game is best known for its "Battle Royale" mode in which up to 100 players compete to be the last person or last team standing. The game also supports other modes where players can interact with others and build virtual environments. It is available on all gaming consoles, as well as smartphones, tablets and PC.[12]

The game is free to download, but the platform uses its own in-game currency (V-bucks), which can, for example, be used to buy clothes and equipment for your avatar. Artists such as Travis Scott and Ariana Grande have staged huge concerts in Fortnite. Both earned nearly USD 20 million from the sale of tickets and virtual concert effects, and the concerts were watched by millions of people in real time. This resulted in more people realising the commercial potential of virtual worlds.[13]

Roblox
Roblox is an online multiplayer gaming platform in which players can develop their own games and play thousands of games developed by others. The platform is particularly popular among children. Roblox has more than 200 million monthly users – more than half of all American children under the age of 16 play games on Roblox and 67 % of all users globally are children under 16.[14]

On Roblox, games can be played together with friends, and you can create networks of friends in the same way as you would on social media. Game developers can earn money from the games they have developed (although Roblox also

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[10] Holm, Adrian (2022)
[11] Iqbal, Mansoor (2022)
[12] Norwegian Media Authority (2022a)
[13] Hatmaker, Taylor (2021)
[14] Dean, Brian (2022)

takes a share).[15] Roblox has its own in-game currency – Robux – which can be used to purchase in-game upgrades, perks and other virtual objects.

Today, the popularity of Roblox is touted as one of the driving forces behind the Metaverse. The fact that so many children are used to playing and interacting with others in online gaming worlds could be an indication of a movement towards a more virtual and immersive internet.[16]

There are virtual worlds that are not focused solely on gaming. These may be reminiscent of the vision for the Metaverse as they offer a variety of activities and services.

Second Life

Second Life was one of the first virtual 3D worlds to break through in the early 2000s and was not based around gaming. In Second Life, users were able to choose what they would do on the platform without any built-in history or specific tasks to perform. Instead, the platform was able to offer something new – *escapism*. In Second Life, users were able to create and live an alternative life, similar to the game The Sims. However, unlike The Sims, it was possible to experience Second Life together with other users. Users could socialise, develop their own content and move around freely.[17]

The platform also had its own economic system and currency – Linden dollars – that could be used to buy clothes or equipment for your avatar. Avatars could be anything from a representation of the user or a fantasy character of their choice.

At its peak, Second Life had 16 million users. Many institutions and companies created their own office buildings on the platform, including NRK (the Norwegian Broadcasting Corporation), DNB (Norway's largest private bank) and several Norwegian universities. Sweden even created an embassy in Second Life.

However, building and developing in Second Life turned out to be quite challenging for most people. Many users did not understand what they were supposed to do as there were no clearly defined story line. The number of users dropped drastically over time. The platform still exists but now has far fewer

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[15] Norwegian Media Authority (2022b)
[16] Ball, Matthew (2022)
[17] Brown, Sara (2022)

users. Second Life differed from the vision for the Metaverse in so far that it was closed, difficult to use and perhaps not sufficiently immersive for users.[18] Nevertheless, Second Life did provide a taster of what could become possible in a massive virtual universe.

Horizon Worlds

Meta has also launched its own virtual platform – Horizon Worlds. This is essentially a gaming platform, on which players, represented by avatars, can interact with one another, and collaborate to solve tasks. Horizon Worlds combines gaming and social interaction, and aims to connect people in a new way, similar to what Facebook initially did.

The platform is intended to be a sort of prototype for the Metaverse, but its popularity is currently limited. Horizon Worlds has been criticised both for poor graphics and resolution, and there have been claims that not even Meta employees wish to spend time there.[19]

BLOCKCHAIN-BASED WORLDS

A separate category of virtual worlds are the blockchain-based platforms. These differ from other virtual worlds for a variety of reasons.

Firstly, most social and game-based virtual worlds are owned and operated by one central player, usually the company that owns the platform. Blockchain-based platforms, however, are built on decentralised blockchain technology. In short, this means that all information about what the avatars in these worlds build, buy and sell to one another is recorded and stored using encrypted files on various servers including the users' PCs, instead of being stored in a central database controlled by a single entity.

Secondly, economic activities on blockchain-based platforms are often based on the use of cryptocurrencies and crypto assets. This entails new and different opportunities for users to earn and speculate in virtual assets. In these worlds, users can create assets, but they can also develop their own content, play games and interact with others.

Thirdly, it can be easier to move currency and virtual assets between blockchain-based platforms, than between closed game-based and social virtual worlds. Cryptocurrencies and crypto assets can be exchanged through a crypto

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[18] Virgilio, Diami (2022)
[19] Heath, Alex (2022a)

exchange, and as such, be transferred from one blockchain-based platform to another. Blockchain-based platforms are therefore less closed and in that sense more similar to the vision of an interconnected Metaverse.

Decentraland

In Decentraland, users can socialise, buy, rent, sell and build self-produced properties and virtual goods using cryptocurrency. Trading takes place using two types of *tokens* – LAND (for the purchase and sale of crypto assets) and MANA (which is the cryptocurrency of the platform). Decentraland claims to have 8,000 daily users, but, according to the blockchain tracking tool DappRadar, the world may have as few as 34 daily users.[20] This could indicate that the presence on the platforms is not as immersive as the vision for the Metaverse sets out or that the social attraction is not sufficiently strong.

The Brønnøysund Register Centre and the Norwegian Tax Administration are moving into the "Metaverse"

In October 2022, the Brønnøysund Register Centre and the Norwegian Tax Administration moved into the "Metaverse". In collaboration with the consulting firm EY, the government agencies rented property in Decentraland. At the virtual offices, visiting avatars were able to find information about crypto reporting from the Norwegian Tax Administration and guidance on "starting a company" from the Brønnøysund Register Centre. The institutions wanted to establish themselves in Decentraland in order to learn about the technology and to meet the "younger generations on their own platforms".[21]

The Sandbox

Users of the virtual world The Sandbox can create, buy and sell virtual goods in a virtual marketplace. The platform was mainly an online video game but has since developed into a social 3D universe with economic opportunities. Here, transactions take place using SAND – the platform's own token. The Sandbox rose to fame when the rapper Snoop Dogg built his own virtual property and held concerts there. The neighbouring property to Snoop Dogg's sold for nearly USD 500,000.[22] Like Decentraland, The Sandbox has limited user numbers – less than 1,000 on a daily basis (and as low as 23 on certain days).[23]

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[20] Lawler, Richard (2022)
[21] Gjessing, Marianne (2022)
[22] Logan, Kylie (2021)
[23] Cohen, Andrew (2022)

In summary, the virtual worlds that exists today have various characteristics that may resemble a Metaverse. However, we are still far away from a fully-fledged immersive and interconnected Metaverse with unlimited capacity.

THE BUILDING BLOCKS OF THE METAVERSE

Extended reality and artificial intelligence will be fundamental building blocks in the Metaverse, with computing power, network capacity and payment systems as key prerequisites. Technology will increase challenges associated with data protection, manipulation and surveillance.

Embedded in the vision for the Metaverse is the idea of providing people with a sense of actual presence.

A sense of immersive presence could be enhanced both by strengthening the connection between the person and the avatar and by ensuring that the actual surroundings and the experiences in the virtual universes are realistic.

Extended reality and artificial intelligence will be particularly important for people to feel present in the Metaverse through their avatars.

EXTENDED REALITY

Extended reality (XR) is a collective term for various types of data-generated environments:

- **Virtual reality** (VR): A fully virtual world that blocks out the physical surroundings. The most immersive experience of VR is achieved through VR headsets that replace reality with virtual environments. Devices with sensor technology, such as haptic suits or gloves, can help make the experience more realistic and immersive. Haptic devices allow people to feel vibrations, movements, resistance and similar mechanical simulations.

- **Augmented reality** (AR): A partially virtual world in which virtual elements are placed on top of the physical surroundings. Unlike VR headsets, AR headsets let in light so that users can see both their physical surroundings and the virtual elements. This technology can also be used through the camera on a smart phone or tablet.

- **Mixed reality** (MR): Combines elements from both VR and AR, for example by using VR headsets to work in a virtual meeting room or office, where you can use several virtual screens, and also see the physical screen and keyboard.

- **Diminished reality** (DR): A data-generated environment where you can reduce and remove physical surroundings and replace them with virtual elements. This technology can, for example, be used to remove the people on a bus and, if you prefer, replace them with cute virtual cats.

XR technology can capture our movements, audio and visual impressions and surroundings. It allows for three-dimensional visual impressions, also referred

to as depth perception.[24] Unlike 2D, 3D provides an experience of size and depth and constitutes a more visual way of conveying information. VR and AR headsets include projectors, sensors, hologram technology, cameras, speakers and batteries, to name but a few features.

Such headsets can, for example, analyse the surroundings to provide information that the user might find interesting. This information can be displayed in the user's field of vision. In this way, the physical and virtual elements become interconnected, and reality would as such be *extended*. Improved audio experiences could, for example, make virtual surroundings more immersive. Research has shown that sound has a crucial effect on *zoom fatigue*.[25] We get more tired from digital meetings because the sound comes from a speaker. In virtual meetings, sound will appear to come from the direction of the person who is talking.

XR technology is becoming more widespread. Snapchat and Pokémon Go filters are examples of existing commercial use of AR. There is also great potential outside of entertainment. The technology can be used for everything from simulation-based training in industry to developing structures, detecting errors or planning and visualisation using virtual 3D models.

In healthcare, the technology has been used to create holograms of organs, which aids diagnostics and surgical planning. Another area that is in development is holographic telemedicine. Virtual doctor's appointments, for example, could be useful during pandemics in order to reduce the spread of infection.[26]

Embedded in the vision for the Metaverse is the possibility to experience it fully virtually through VR, but also partially virtually through the usage of other forms of XR technology. Furthermore, the Metaverse could be experienced in 3D, even though games, software and features in the Metaverse would remain in 2D.[27]

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[24] Høvding, Gunnar (2020)
[25] Sparrow, Mark (2020)
[26] Brun, Henrik et al. (2020)
[27] Ball, Matthew (2022)

Hardware

To reinforce a sense of presence, hardware – the technological devices that will provide access to the Metaverse – has an important role to play. VR and AR headsets, as well as haptic devices with sensor technology will provide people with the opportunity to perceive, feel and sense in a virtual universe.

Embedded in the vision for the Metaverse is the possibility to experience the Metaverse without VR headsets. Existing digital devices, such as PCs, tablets, smartphones and wearable technology will likely be just as important.[28] Our surroundings and devices are becoming smarter and are equipped with sensors and internet connectivity (also referred to as the Internet of Things).[29] If the Metaverse becomes a 3D-based internet and reality is extended by virtual elements being placed on top of the physical surroundings, smarter surroundings could make it possible to access the Metaverse without needing specific devices.

In the future, high-tech contacts may replace XR headsets. Perhaps it will even be possible to connect the brain directly to the Metaverse. Currently, these are only hypothetical possibilities. VR and AR headsets will likely provide the most immersive experience of the Metaverse, at least for the foreseeable future.

VR and AR headsets have been available for sale for more than a decade, but the sales figures have been moderate. Apple is rumoured to be developing AR and MR headsets, but no-one knows when these will launch. Meta's new VR headset, Quest Pro, launched in the autumn of 2022, have received mixed reviews.[30] Even though Meta believes that VR headsets will eventually replace PCs, the headsets are still heavy, expensive and the software is underdeveloped.

Mark Zuckerberg himself has stated that bringing together all the technology needed for an immersive experience of the Metaverse in simple spectacle frames is "the hardest technology challenge of our time".[31] Billions of dollars are invested in the development. However, whether such glasses will replace or supplement existing digital devices remains to be seen.

ARTIFICIAL INTELLIGENCE

In simple terms, artificial intelligence is advanced data analysis. By interpreting, analysing, and identifying patterns in large volumes of data, artificial

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[28] Ball, Matthew (2022)
[29] Norwegian Board of Technology (2015)
[30] Robertson, Adi (2022)
[31] Zuckerberg, Mark (2021)

intelligence learns to understand and perform new tasks. This could include something like recreating the feeling of touching an object, in a virtual world.

While extended reality will help connect our senses online, artificial intelligence is what will make our sensory perceptions in the Metaverse feel realistic. This technology will be crucial for people to be able to see, listen, feel and participate in virtual experiences using their avatars. This could enhance the experience of presence and immersion in the Metaverse.

Research has shown that the more realistic the avatars seem, the more immersive the virtual surroundings appear.[32] Meta's Quest Pro VR headset includes features that will make avatars more like humans. Quest Pro has an embedded facial expression recognition feature, allowing your avatar to mirror your actual facial expressions. Artificial intelligence enables the sensors to capture, interpret and convey such details.

Artificial intelligence is crucial for several avatar features. Meta announced that "legs are coming" to the Metaverse in October 2022.[33] Until now, avatars have been floating torsos because VR and AR headsets are better at reading and analysing upper body movements than leg movements. Now, however, the systems will be trained to predict leg movements based on how the upper body moves, using artificial intelligence.

The technology will also play an important part in making virtual surroundings and experiences sufficiently detailed. It will be able to process the surroundings in the Metaverse in real time and convey this information to people in an understandable and meaningful way.

Artificial intelligence will also be used to produce content in the Metaverse. The technology can, for example, translate text and language in real time, generate content such as images, video and text, and convey these using advanced algorithms.

DATA COLLECTION AND PROTECTION

Several challenges arise from the usage of new technology in the Metaverse. The collection and processing of data and the associated data protection challenges could become much more extensive. People's personal information has become

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[32] Dionisio, J. D. N. et al., (2013)
[33] Ghaffary, Shirin (2022)

the most important resource in today's internet. Online surveillance is big business, and the collection and usage of personal data will most likely play a crucial role in the making of the Metaverse.[34] The Metaverse is therefore likely to pose numerous challenges to the right to privacy.

Equipment that provides access to the Metaverse, from PCs to smartphones to VR or AR headsets, and gloves with touch sensors, will be able to record, interpret and analyse large volumes of data. This data can be used to improve digital services, but the large amount of data can also make it harder for users and developers to understand what data is collected and what the data can be used for.

Sensors will be able to capture how you move your body, where you are looking, how long you are looking at something and what makes you stressed, happy or tired. The devices can monitor heart rate, breathing and blood pressure.

Research has shown that using a VR headset for just five minutes provides sufficient data to identify a person with an accuracy of 95 %.[35] Such data could not only be used for identification, but also for tailoring and personalising virtual experiences and predicting user behaviour in real time. The data can also be used to identify unconscious psychological and physiological conditions that people are not aware of themselves.[36]

What type of data that can be collected, who has access to the data and how the data can be used are therefore important questions for the Metaverse. The rights of the Metaverse user will also be an important question of concern. Whether users will have the opportunity to request access to self-generated data or be able to request their personal data to be deleted remains to be seen.

MANIPULATION AND INFLUENCE

If extensive data collection and processing are permitted in the Metaverse, this could mean that commercial companies will be left with extensive volumes of data relating to intimate aspects of users' lives. It can also make people vulnerable to manipulation and influence, not to mention surveillance.

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[34] Norwegian Board of Technology (2016)
[35] Miller, M.R et al. (2020)
[36] Rosenberg, Louis (2022)

Profiling and targeted advertising are currently widespread on social media and represent the core business model of big tech companies.[37] In a Metaverse, where companies would have knowledge of intimate details relating to our bodies, actions and lives, profiling and marketing could also become more advanced, and invasive. The companies' business models could lead to users choosing to share their user data in exchange for "free access" to services.

The Metaverse enables marketing in far more subtle ways than before. Virtual people (also called *veeple*), for example advanced forms of chatbots, could be placed in the Metaverse and appear to be just as real as the surroundings. Research has shown that people are unable to distinguish between artificial human faces and real faces and that artificial faces appear more trustworthy and reliable than real faces.[38] Virtual people could have a variety of functions in the Metaverse, from providing information to users to advertising products on behalf of a company. However, if left unregulated, it can also enable new forms of influence and manipulation.

Meta has already patented technology that will allow for targeted marketing in virtual worlds. The company will place virtual objects in the surroundings.[39] You may assume that the surroundings look the same to everyone, but in fact, it could be personalised, customised, and targeted to you specifically. It could become difficult, if not impossible, to distinguish between commercial and non-commercial content in the Metaverse, unless requirements are imposed on advertisers and platforms to regulate, label and manage such content.

In immersive virtual universes, where it is difficult to distinguish real from false, algorithms may have an even greater influence on people, and deepfake technology can become more widespread. This gives commercial companies great power and increases the risk of manipulative content and design.

There are also several unresolved questions linked to the psychological and health-related consequences of virtual worlds and experiences. We do not have a complete picture of how invasive the Metaverse can be. Disinformation, fraud and radicalisation could take place in real time. We know that VR can cause nausea, dizziness and balance disorders, but further research is also required on the psychological and health-related long-term effects of XR technology.[40]

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[37] Norwegian Board of Technology (2016)
[38] Nightingale, Sophie J. and Hany Farid (2021)
[39] Murphy, Hannah (2022)
[40] Davis, Nicola (2016)

A number of legal questions arise in relation to digital representation and the status of virtual people in the Metaverse.

The technology enables our digital twin, whether an avatar or hologram, to share our biometric characteristics. It can have the same voice, eyes, walk, motor skills and facial expressions as the person themselves. Is your avatar *you* since it connects you and your biometrics? If your avatar is harassed or the victim of a criminal act, was the victim the person, the avatar or both? How would this be regulated? What if it becomes possible to instruct your avatar to perform tasks in the Metaverse even when you are logged off and your avatar is subjected to hate speech or other criminal acts? Did this also happen to your physical person?

The development of virtual people also introduces several new challenges. Who is responsible for virtual people in the Metaverse? Is it the developer of the algorithm behind the virtual person, the company using the technology or the platform that enables such use? Bias in artificial intelligence may occur as a result of machine learning, and this can be difficult to detect. How do you prosecute a virtual person, for example, if they discriminate or express hate speech as a result of machine learning or pre-programmed code? The status of virtual people is also a question of concern. Can people do whatever they want with virtual people simply because they are not real people?

These are complex legal issues of concern for the future Metaverse.

COHERENCE

One characteristic of the virtual worlds in the Metaverse that will distinguish them from existing online platforms is that they will be connected. This means that people will be able to freely move (their avatars), including their virtual assets and history, between different worlds and services using a single identity (often referred to as *data portability*).

INTEROPERABILITY AND DATA PORTABILITY

The Metaverse will likely consist of many connected worlds and services. Unlike operating systems such as Android and iOS, which cannot easily be unified, the

vision for the Metaverse is that the different universes and services will be connected in a coherent and transparent manner. Interoperability is an important feature of the Metaverse.

Today's gaming platforms and virtual worlds are largely closed systems. This means, for example, that they store objects and user data in different formats. They are built and operated using different code and there are not necessarily any efficient systems available to share or convert data across the platforms. They also have their own currencies and economic systems based on the distinctive rules applicable to the platforms. The experiences and opportunities in the platforms are also incompatible, from VR and AR experiences to 2D and 3D games.

An interoperable Metaverse requires agreement on standard formats. Achieving this is easier said than done. It would entail standards for infrastructure, coding, technical devices, user interfaces, data protection, digital currencies, and ownership, to mention some. These standards must also be subject to governance and legislation.

Without interoperability, it would be possible to end up with several prototype metaverses or so-called *betaverses*. There, users could have different identities in different virtual worlds, but limited opportunities to move themselves, their history and their assets between the worlds.[41]

A VIRTUAL ECONOMY

A virtual economy is required for people to be able to buy services and goods in the Metaverse. The economy must work in each virtual world, across different worlds and between the Metaverse and the physical reality. The idea is that people should be able to bring their assets safely and efficiently from one universe to another. One system to track, validate, register, modify and transfer ownership would therefore be critical for ensuring a coherent Metaverse economy.[42]

A payment system
Today, the virtual worlds use different economic systems. Gaming platforms like Fortnite and Roblox have developed their own economies, in which money can be exchanged for the in-game currency: Robux in Roblox and V-bucks in

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[41]*Betaverses* are used by the Copenhagen Institute for Future Studies in a scenario that deals with the emergence of multiple virtual universes at the expense of one connected Metaverse – see Copenhagen Institute for Future Studies (2022).
[42] Ball, Matthew (2022, p.124)

Fortnite. The rules are strict, and it can be difficult to give money to other users or to exchange the game currency back to regular money.[43] It has also proved difficult to change e.g., Linden dollars from Second Life to Emeralds from Minecraft due to the differences in the underlying system architecture.[44]

Cryptocurrencies are used in the blockchain-based worlds The Sandbox and Decentraland. Virtual assets and property are also sold as *non-fungible tokens (*NFTs) in these worlds. The NFTs represent ownership of unique, digital files that cannot be copied. These could be unique digital artworks, virtual goods such as the avatar's trainers or a virtual property.[45]

In order to exchange cryptocurrencies between different blockchain-based virtual worlds, a crypto exchange can be used. Cryptographic *wallets* can provide a suitable way of storing cryptocurrencies.[46] Blockchain technology and cryptocurrencies allow for the efficient exchange and transfer of assets across platforms. Cryptocurrencies, NFTs and other cryptoassets can therefore form the basis for the economy in a virtual Metaverse. Proponents of blockchain technology will argue that this technology is critical to realising the Metaverse.

Nevertheless, it is not certain that blockchain technology will become one of the building blocks of the Metaverse. Many people are critical of the technology, and it is too early to say what role it might play.[47] Cryptocurrencies are characterised by little regulation, major price fluctuations and lots of speculation and have led to new forms of fraud and money laundering.

The development of efficient money and payment systems that work between universes and the physical world will nevertheless be central to several features of the Metaverse. There are many regulatory and policy-related questions associated with a virtual economy – questions relating to ownership, taxation, regulation and supervision will be crucial.

POWER AND CONTROL

Who gains power and control in the Metaverse will be strongly linked to the economic models and standards that are adopted.

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[43] Østbye, Peder (2022)
[44] Chen, Youngwei and Hua Cheng (2022)
[45] Norwegian Board of Technology (2022a)
[46] Norwegian Board of Technology (2022b)
[47] O'Reilly, Tim (2021)

In a centralised Metaverse, it is likely that a small number of players would have great power. Such players could, for example, charge a fee for transactions on the platform as they would be able to determine the rules for the economic system. This is, for example, done by Roblox today.[48] In such a centralised model, users will not necessarily have the freedom to control or own parts of the digital surroundings.

Users may have a greater degree of control over their own data and assets in a decentralised Metaverse. The blockchain could be used to effectively verify identity and users could have the opportunity to shape and influence the virtual world itself. In such a model, decentralised autonomous organisations (DAOs) – organisations coded as data programs on the blockchain and controlled by the organisation's members themselves – could rule and make decisions based on what the majority prefers.

It is also possible to envisage a combination of a centralised and decentralised basic structure. Such a Metaverse could, for example, consist of different worlds and services controlled and managed by tech companies, but bound together by cryptocurrencies.

There is great competition to develop the standards that will apply to the Metaverse. The company or companies that succeed with their solutions could assume a dominant position in the future virtual worlds. If the tech companies become the gatekeepers of the payment systems in the Metaverse, this could lead to major market advantages, a concentration of power and prevent innovation and fair competition.[49] In other words, there is a lot at stake when standards are developed.

Microsoft, Meta and a number of other tech companies recently entered into a collaboration to develop the standards for the Metaverse.[50] These common standards are supposed to make it easier for developers to build the Metaverse and will apply to 3D graphics, avatars, network functionalities and XR technology. Apple is not part of this network. This could result in an Android-iOS battle for the Metaverse, in the sense that the companies will compete to define the future standards of the Metaverse.[51]

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[48] Norwegian Media Authority (2022b)
[49] EPRS (2022)
[50] Metaverse Standards Forum (2022)
[51] Heath, Alex (2022b)

IDENTITY

Having a single identity across several virtual platforms and services leads to various challenges. It could blur the line between a private and a public persona and allow for data collection across platforms and services. This could contribute to more advanced profiling and tracking. It may also make people more vulnerable to identity theft and computer attacks. Avatar duplication or other criminal acts against avatars may occur.[52] Challenges may also arise with regards to identity and age verification, also in a situation in which users are able to choose the appearance and design of their avatars.

This also gives rise to questions relating to users' freedom of choice. Should you have the right to remain anonymous in the Metaverse? Are you tied to one identity, one gender and one specific design in all universes and to what extent do you have the freedom to choose? As women are subjected to more sexual harassment on gaming platforms than men, it is possible to imagine that fewer people would select the female gender for their avatars. This could lead to less gender diversity and more underrepresented groups in the Metaverse (issues related to discrimination is further discussed in the chapter "Human rights in the Metaverse").[53]

SIMULTANEITY

One characteristic of the Metaverse is that an unlimited number of people should be able to interact simultaneously. This may not be too hard to imagine, given that an unlimited number of people can be connected to the internet simultaneously. However, a virtual presence in real time will require far more network connectivity and speed than what is possible with current technology. The Metaverse will exist independently of time and place, and the vision is that anyone should be able to access the Metaverse at any time.

The importance of network capacity, speed and computing power can be illustrated in the *Metaverse Sniper Problem*.[54] In theory, if you use a sniper rifle to zoom in on an area far away in the Metaverse, you should be able to view that area in a high resolution to make a precision shot. This is already difficult in

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[52] EPRS (2022)
[53] Thorpe, Lucy (2022)
[54] Macaulay, Thomas (2022)

today's computer games. In a Metaverse with thousands of simultaneous users, this would require significant network capacity and computing power.

Computing power

Virtual 3D environments and a large number of concurrent users place completely different demands on computing power and processing than today's internet. One of the world's largest chip manufacturers, Intel, believes that computing power needs to increase nearly a thousand times from the current situation in order to support a metaverse.[55]

The need for computing power will also affect consumers and the type of devices and computers they need to access the Metaverse. Many of the current computers and devices for extended reality will likely not have the required computing power to participate in the Metaverse. This creates challenges for developers – can we assume that users will have powerful enough devices to handle the need for computing power locally or do we need to focus on cloud solutions for the majority of processing? While a local solution would increase the price of user devices, a cloud solution would entail incredibly high demands in terms of internet access and latency to avoid lag.[56]

Another possible solution is so-called *edge computing*. Here, the storage and processing of data will take place closer to the consumer using a decentralised solution. In this way, it becomes possible to save both time and computing power as data is transmitted over a shorter distance rather than to a centralised server in the cloud.

Bandwidth

The internet connection will be important in the Metaverse as it determines how much data can be transferred per second. Services that transfer text, sound and images require significantly more bandwidth than simple services like e-mail.

Norway has excellent broadband compared to other countries. According to the Norwegian Communications Authority, 90 % of all Norwegian households have access to broadband with download speeds of at least 100 Mbit per second, while 86,5 % have access to at least 1,000 Mbit/s via fibre and cable TV

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[55] Gartenberg, Chaim (2021)
[56] Ball, Matthew (2022)

networks.[57] This is not the case globally. Nearly half of the global population does not have access to the internet.[58]

Latency
Latency describes the time it takes to transmit data from one point to another. In practice, the term is used to describe lag, for example how long it takes from clicking the pause button in a YouTube video until the video actually stops. Lag rarely plays a big part in asynchronous services and many other services. It usually makes little difference if clicking pause results in a few milliseconds or even a whole second of lag.

However, in games and other services in which your actions need to take place in real time, there is a very low tolerance for lag.[59] For example, you might find that the tackle you make in a football game occurs after your opponent has passed you, because the lag is too long. This contributes to lowering the quality of the experience.

In video calls, it will also be frustrating if audio and video are out of sync or facial expressions and gestures do not occur at the same time as the voice is heard. This means that social interactions become more unnatural and robotic, which is the very opposite of the vision for the Metaverse.

Further challenges may arise when using technology for virtual or extended reality. For example, if you turn your head or use handheld controllers to react to something, latency must be low enough to ensure that the surroundings do not "lag behind" these movements.

The lowest possible latency will not only ensure a better experience for the user but will likely also be important to developers for commercial reasons. Studies have shown that an increase or decrease in latency of 10 milliseconds can result in an increase or decrease in weekly gaming time of six per cent.[60] If the Metaverse aims to keep users engaged and active, latency will be one of the main challenges that need to be solved.

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[57] Norwegian Communications Authority (2021)
[58] World Economic Forum (2020)
[59] Ball, Matthew (2022)
[60] Ball, Matthew (2022)

DISTRIBUTION AND ACCESS

The Metaverse will require significant computing power, speed and network capacity. This gives rise to challenges with regards to who the infrastructure will be developed by and who will pay for it.

Various partnerships are taking shape – Meta has, for example, partnered with the telecommunications operator Telefonica. Together, they run an innovation hub in Madrid where they explore new possibilities for the Metaverse and network connectivity.[61] In the UK, there is already an emerging discussion about who will pay for the development of high-speed infrastructure: telecommunication operators, authorities, service providers (like Meta) or the users themselves.[62]

In Norway, the right to open access to the internet is enshrined in law. The net neutrality principle means that the internet must be an open and non-discriminatory platform for all forms of communication.[63] At some point in the future when we connect to the Metaverse, it will be easy to think that digital services are completely detached from our physical location. However, since network connectivity will be essential, the physical location will have a significant impact on the experiences we can access. In other words, the Metaverse may enhance digital inequality within countries, but also globally.

CARBON FOOTPRINT

A Metaverse with unlimited capacity will likely require large amounts of energy.

Data will be stored in cloud solutions run from data centres somewhere around the world. These are critical to current internet infrastructure and enable internet features such as streaming, social media and cloud storage.

A single data centre can use as much power as a small town and most data centres today are not based on renewable energy sources.[64] Researchers estimate that global data centres will use seven times as much electricity as Norway does today by 2030.[65]

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[61] Dobrynin, Vlad (2022)
[62] Lewis, Leo (2022)
[63] Norwegian Communications Authority (2022)
[64] Haga, Atle (2022)
[65] Andrae, Anders S. G. (2022); Statistics Norway (2022)

Renewable data centres, on the other hand, can contribute to reducing the carbon footprint of the Metaverse. Several of the largest players seeking to build the Metaverse, have also made promises to reduce emissions. Microsoft intends to become carbon-negative by 2030 and Google aims for its data centres to be carbon-free by the same year.[66] However, the credibility of these climate goals have been questioned.[67]

Not only could the Metaverse be highly energy-intensive, but the development of the technology, from machine learning for artificial intelligence to the development and production of hardware, could also lead to substantial emissions.[68]

On the other hand, the Metaverse could have climate-positive effects through virtual goods replacing physical goods and virtual interactions reducing the need to travel.[69] An office based in the Metaverse could be more energy-efficient than operating physical office buildings. However, whether these effects would compensate for the substantial energy consumption required for the development and operation of a Metaverse remains highly uncertain.

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[66] Paresh, Dave (2020)
[67] Calma, Justine (2022)
[68] Ekin, Anette (2019)
[69] Morini Bianzino, Nicola (2022)

HUMAN RIGHTS IN THE METAVERSE

The Metaverse will present some fundamental challenges to human rights. The more extensive the Metaverse becomes, the greater the impact on human rights will be – for better or worse.

A HUMAN RIGHTS APPROACH

The Metaverse has the potential to become a phenomenon that will impact our human rights in transformational ways comparable to the smartphone. Society and individuals alike benefit from new technology, facilitating the safeguarding of human rights. But increased reliance on new technology may also have negative consequences for human rights. The less benign effects may be unpredictable and difficult to foresee.

Future integration of our lives with the Metaverse may supersede the profound transformation associated with the smartphones of today. Virtual reality will be based on technological innovations that will remove the experience of distance and geographical importance to a much greater extent than the current internet. Instead of surfing *on* the internet, we will be *in* it. The Metaverse will therefore challenge human right protection in more fundamental ways.

In the Metaverse, you might stroll around on a virtual shopping-street in Paris while you are still physically present in your own appartement in suburban Oslo. The opportunities may appear limitless. But who will carry the responsibilities for safeguarding your human rights while you undertake this activity? Is it the Norwegian government, the French government, the tech-company developing and selling the VR-technology enabling your "tour", the company controlling the platform or the company running the store on the virtual shopping street? Imagine that the activity you participate in is not shopping, but rather gambling in a virtual Las Vegas, or assistance to retaliatory attacks on a Russian paramilitary entity in a virtual Moscow.

One possibility is that the Metaverse will provide us with a digital universe separate from the physical world for which our human rights were made. Another possibility is that the Metaverse will integrate with the real world, resulting in an extended reality by introducing virtual elements into our physical reality (see "What is the Metaverse").

The core issue for the Metaverse and human rights is whether existing human rights must be adapted to and extended into the Metaverse or whether we need to distinguish between human rights in two separate realities. This could give us a segregation of rights, leaving one set of human rights for the physical world and another for the virtual Metaverse, i.e. digital human rights.

Regardless of which fundamental structures we eventually decide to establish, novel and unprecedented challenges will arise in the interplay between the physical and virtual worlds. The Metaverse will have consequences for human rights in the physical world, which will then feed back into human rights protections in the virtual world. Even if separate, there will be spill over-effects and interaction between the two.

A coherent and immersive Metaverse with unlimited capacity as outlined and discussed in this report remains a phenomena of the (not too distant) future. An analysis of human rights challenges in the Metaverse must therefore base itself on hypothetical projections and predictions about how the Metaverse will develop. Without prejudice to the way forward, this report takes the current human rights regime under international law as its point of departure, sketching out certain overall problems and issues that are likely to arise under various scenarios for the future Metaverse.

WHO IS ACCOUNTABLE?

HUMAN RIGHTS ACCOUNTABILITY FOR STATES AND COMPANIES

Whether states or companies will run affairs or be in charge in the Metaverse remains to be seen. At present, tech giants such as the GAFAM (American), BATX (Chinese) or specialized gaming companies, develop and possess the technology allowing for progress towards the Metaverse.[70]

The traditional approach to human rights relies on a structure where states are the entities responsible for safeguarding human rights. Companies are not legally accountable for human rights violations in the same direct way as states under international human rights treaties. The responsibility of companies is primarily one of avoiding that their activities contribute to human rights violations held by states, primarily on their own sovereign territories.[71] This similarly applies to the Metaverse.

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[70] GAFAM stands for the American companies Google, Amazon, Facebook, Apple and Microsoft, while BATX represents their Chinese counterparts Baidu, Alibaba, Tencent, Xiaomi.
[71] UN Guiding Principles on Business and Human Rights (2011)

The Metaverse, however, being a parallel reality, could be detached from physical reality. The question therefore becomes how a state can be responsible for safeguarding human rights of its citizens in a *deterritorialised* virtual world in which the state does not have prime jurisdiction but is at the mercy of tech-companies (or other states) that possess the technology, control and develop the infrastructure, give its own rules and run the show? The visitors in the Metaverse will find themselves physically under the jurisdiction of one state, but this state may exercise little or no power over the parallel virtual universe. Who shall then safeguard human rights in the virtual world?

In a Metaverse run by tech giants, companies may end up with unprecedented power over human beings. Power to shape the infrastructure of the Metaverse could give companies almost total control of the virtual world. The intimate nature and amount of data potentially gathered about each person venturing into the Metaverse may surpass anything previously known to man. This gives rise to the question of whether companies rather than states should be directly legally responsible for safeguarding human rights in the Metaverse. Will the new virtual world of the Metaverse require a new accountability model for human rights in which the human rights responsibilities would be held directly by companies, mirroring their power over technology, infrastructure and data in the Metaverse - comparable to (or even surpassing) the jurisdiction and control held by states in the physical realm?

One challenge is that companies and states approach rights in different ways. This originates in the fact that the roles, responsibilities and interests of a company in relation to individuals differ from that of a state. The human rights approach compels states to focus on human autonomy, relying on a vocabulary of citizenry, whereas companies rather focus on human consumer choices, relying on a vocabulary of customers. While the power of companies in the virtual world may come to surpass that of states in the physical realm, the horizon and scope of companies' responsibilities for their "subjects" do not.

Irrespective of how the human rights structure of the Metaverse will eventually develop, states will continue to be responsible for safeguarding human rights in the physical realm. Provided we end up with one set of human rights for the physical world and one set of rights for the virtual world, numerous questions about responsibility for human rights will arise in the intersection between the two.

Human rights are held by natural persons, and it is incumbent upon the States to respect and safeguard these rights. Individuals are rightsholders, while the state is the primary legal subject responsible for human rights in territory under its control.

The *duty to respect human rights* means that in the exercise of state authority the state must refrain from interventions or restrictions that will violate rights such as the right to life, liberty, freedom of expression or privacy. To the extent that state authorities make interventions, they must pursue a lawful purpose, and not go beyond what is necessary and proportionate to achieve that lawful purpose.

The *duty to secure human rights* entails that the state authorities must prevent others from violating human rights on the state's territory. This implies a duty to ensure and enforce legislation that will protect us from violations of our human rights by parties other than the state. For example, there must be penal laws, trials and punishment in order to prevent *other person*s from violating the right to life. But the duty also obliges the state to actively provide services, for example in the form of healthcare services in order to secure the right to life and health.

The duties to respect and secure human rights apply where the state has jurisdiction. In most cases, jurisdiction corresponds to the sovereign territory of the state. Therefore, fundamental questions are: "who will have jurisdiction in the Metaverse", and "should the duty to respect and secure human rights reflect jurisdiction"? A similar issue arises with respect to where the violation should be registered. Do rights violations occur where the user is physically located, where data is generated virtually or where the owner of the Metaverse or its infrastructure has chosen to locate its physical headquarter?

DO WE NEED NEW HUMAN RIGHTS?

Human rights are technology-neutral. Individuals are protected by the same international human rights in the physical and digital domains alike.[72] If an individual is physically present in Norway, the Norwegian authorities will be responsible for respecting and safeguarding the person's human rights.

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[72] UN General Assembly (2019), UN Human Rights Council (2012) and (2018) and the Tallinn Manual (2017, Rule 35).

A crucial question for human rights in the Metaverse will be how human rights in the physical world and the Metaverse interact. Will the Metaverse be akin to any digital platform, i.e. an extension of the physical world, or will an integrated Metaverse require an entirely new and separate set of rights? Will our avatars and holograms be bestowed with a separate set of digital human rights largely detached from the physical realm and Norwegian territory?

Traditional human rights protections are geared towards the dangers of the physical realm, and are less adapted to a virtual information-based universe. A discussion is therefore emerging concerning the need for a completely new concept of human rights for a virtual reality such as the Metaverse.

One suggestion is to create a parallel set of digital human rights distinguishing between *offline* and *online* human rights. A proposition to this effect is an introduction to the UN Declaration of 1948 of a set of rights reserved for everyone's digital twin – your digital representation – that will mirror rights in the physical realm.[73] If extended to the Metaverse, each person could end up with a *digital persona* in the Metaverse – a virtual representation that can exist and have Metaverse rights independent of the legal subject in the physical realm.

A virtual universe likewise gives rise to a discussion about the further development of existing human rights. Do we need a new human right to oblivion (to be forgotten), a right to stay offline, a right to forsake our digital presence or a right to protection against algorithms?[74]

FUNDAMENTAL HUMAN RIGHTS

THE RIGHT TO LIFE

Human rights are structured in a hierarchical manner. Some rights are fundamental in the sense that other human rights are premised on them, such as the right to life. As life in the Metaverse will be digital, the human rights hierarchy will be altered. A person will most likely be able to have more than one life in the Metaverse. If your digital representation, for example an avatar, is wiped out, it would be a nuisance, but not beyond repair. Resurrection or a second life could be afforded to the avatar. The most fundamental right of all, the human

[73] Change (2021)
[74] Norwegian National Human Rights Institution (2022)

right to life, and adjacent rights relating to physical integrity, would play a much less prominent role in the Metaverse.

THE RIGHT TO PERSONAL DATA

Digital life in the Metaverse would be based on data. Hence, the rights relating to data and data protection will move to the fore. Other human rights will move up the chain and dominate in the Metaverse compared to the physical world. With the arrival of the age of technology, the right to privacy and the right to manage your own personal data have taken on an entirely new significance.[75]

The human right to privacy is protected by the European Convention on Human Rights (article 8) and the United Nations International Covenant on Civil and Political Rights (article 17). The EUs Basic Charter on Human right and the GDPR (General Data Protection Regulation) has established strict standards and far-reaching enforcement mechanisms in order to protect personal data. The right to privacy also enjoys strong protection under domestic law in most countries, such as the Norwegian Constitution (section 102). The right to personal data includes existing or derived data concerning an individual and his/her life, and decisions based on this data. The right also protects the freedom to make decisions about identity.

In a virtual reality such as the Metaverse, everything is based on data. The rights protecting such data assume a correspondingly important role, akin to that of the right to life in the physical realm. The degree of personal autonomy envisageable will largely depend on how personal data is protected. The right to privacy in the form of the management of your own data will be of fundamental importance in the hierarchy of digital human rights, and will be a prerequisite for enjoying numerous other human rights, such as the freedom of thought and expression. In turn, the hierarchy will influence how rights are interpreted and adjusted, including which right prevails in cases of collision of rights.

FREEDOM OF THOUGHT AND EXPRESSION

The right to freedom of expression and the prohibition against discrimination are *enabling* human rights. If they are respected, it facilitates for other human rights. If enabling rights are disrespected, cascading effects will negatively impact other human rights. The enabling rights of freedom of expression and

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[75] UN Committee on the Rights of the Child (2021, paragraph 67), the European Court of Human Rights (2022)

protection against discrimination will be of fundamental importance in the Metaverse.

According to international treaties, freedom of expression applies to any medium, encompassing modern technology such as social media.[76] Freedom of expression aims to protect the search for truth, democracy and the freedom of opinion of each individual.[77] It comprises both the right to seek and receive information, and to share ideas and opinions. It is closely linked with the right to freedom of opinion and thought.[78]

The Metaverse is likely to pose challenges to freedom of expression on three different accounts. Firstly, data relating to acts and expressions in the Metaverse may be collected and compiled in completely new and all-encompassing ways. Any entity with access to this data will be able to amass the digital history of your digital persona, allowing for extensive profiling, with potentially highly detrimental effects for freedom of expression in the Metaverse.

Secondly, acceptable standards for oral and visual statements in the Metaverse will have to be developed based on a common standard. Yet, what this standard should be, is far from evident. Different countries, cultures, religions and social classes have diverging standards governing which statements or expressions could be affected by restrictions or prohibitions relating to freedom of expression. A Metaverse in which "the entire world meets", will be faced with innumerable issues linked to the limits for acceptable speech or expressions, what kind of interventions should be subject to restrictions, according to which standards, and decided by whom.

Thirdly, questions will arise concerning the authority to interfere with the freedom of expression, the nature of sanctions and opportunities for redress.

PROTECTION AGAINST DISCRIMINATION

Protection against discrimination entails that data about a person's identity must not give rise to differential treatment, unless for justified reasons. The prohibition against discrimination is established by the European Convention on Human Rights (article 14) and the United Nations International Covenant on Civil and Political Rights (articles 2(1), 3 and 26). It is also proscribed under

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[76] The Tallinn Manual (2017)

[77] Second 100-2 of the Norwegian Constitution.

[78] UN Declaration (1948, Article 19), SP Convention (1976, Article 19(2)), UN Human Rights Committee (2011)

domestic law (Norwegian Constitution, section 98). Protection against discrimination stipulates that discrimination on the grounds of race, skin colour, gender, language, beliefs, political or other opinion, national or social origin, matters relating ownership, childbirth or other status is prohibited.

In the Metaverse, your avatar might mirror your physical self, but it might also be possible to create additional digital twins based on different profiles. While Metaverse enthusiasts speak of a world in which equality can thrive and discrimination can be contained compared to the physical realm, the Metaverse could also introduce new forms of discrimination. If important societal functions are transferred to the Metaverse, there will be issues of access for people with disabilities, such as the blind or physically disabled. Questions will also arise concerning which authority would be responsible for safeguarding against discrimination in the Metaverse, and avenues for redress.

THE RIGHT NOT TO BE MONITORED

The rights to privacy, freedom of expression and freedom from discrimination all serve the function of keeping state authority in check in the encounter with individual subjects. These rights therefore provide checks and balances that constitute foundations for a democratic society.[79]

In the Metaverse, all activity will ultimately be based on data. Enormous amounts of personal data will be storable and may potentially serve to map, analyse and profile individuals in unprecedented ways for the purpose of surveillance. The technological tools used to provide access to the Metaverse, such as VR headsets, movement sensors and eye movement trackers, are also potential sources of biometric data about each individual user, offering the possibility to map the physical and mental state and reaction patterns of each individual user (see subchapter "Data collection and data protection"). The combination of data-tracking in the Metaverse with the biometric data of each physical user, gives us the prospects for surveillance of an intrusive nature previously unknown to mankind. Biometric data of the physical user and the potential to track all movements and actions inside the Metaverse will therefore enable procurement of more knowledge about a Metaverse user externally than the user has about him- or herself. With the help of analytical tools based on artificial intelligence, such knowledge could include sexual orientation, political preferences or underlying diseases. Artificial intelligence-based tools with the ability

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[79] UN High Commissioner for Human Rights (2021, paragraph 6).

to accurately determine sexual orientation by reliance on facial imagery is already available.[80]

The combination of these factors makes the Metaverse an extremely potent and potentially dangerous tool. It may introduce a level of surveillance, the pervasive nature of which has never been previously known to any society.

RIGHTS IN A VIRTUAL ECONOMY

A Metaverse with a proper virtual economy will introduce questions about ownership rights and copyrights that will have human rights aspects. When a person is employed in the Metaverse, and receiving salary in the Metaverse, the person must be protected by labour-rights and anti-discrimination rights.

ILO-treaties on labour-rights mostly express global standards. However, the levels of implementation vary significantly between countries and continents. The Metaverse will give rise to questions about who will determine standards of implementation, who will monitor compliance and who will enforce sanctions. As more activity is moved from the physical to the virtual realm, complex legal questions with effects for implementation of human rights will follow.

FUTURE SCENARIOS

The overall structures that establish and control data management and data exploitation, will determine what human rights protection may come to look like in the Metaverse. How the Metaverse is built, will precondition which legal subject may assume accountability for human rights. A range of possibilities exist. Will the Metaverse be free and open without states, borders or similar obstacles of geographical or political constraints? Will megacompanies control one or more betaverses or will states conquer and reign virtual territories in ways reminiscent of the physical realm?

The urgency and gravity of most questions of human rights raised here, will depend on which structures will ultimately prevail in the Metaverse.

Uncertainty about future developments makes it a hazardous undertaking to predict how human rights will come under pressure in a future Metaverse.

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[80] Porto Júnior, Odélio (2017)

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Therefore, we have looked to The Copenhagen Institute for Future Studies for guidance. The Institute has developed four architype-scenarios for the future Metaverse.[81] Each scenario comes with a different overarching structure for management and control. In the following, we analyse each architype-scenario from a human rights perspective, looking at which human rights challenges are likely to dominate in each of the four different architype scenarios.

THE FREE METAVERSE – A VIRTUAL WILD WEST

The Metaverse in this scenario will be open and free – a new decentralised version of the internet. The free Metaverse will create a new digital realm beyond physical reality, attainable through new technology, where no entity is in charge, but where all may establish themselves and operate.

This utopian version of the Metaverse would present significant problems from a human rights perspective, because it would be unclear which entity would be responsible for safeguarding our rights in a free Metaverse. Human rights obligations are held by states. The human rights responsibility of companies is derived from this basis, and focus not on *safeguarding* human rights, but on avoiding *contribution* to human rights violations.[82] Tech companies increasingly adopt their own industry standards to ensure that they do not contribute to human rights violations. For example, in 2022, Meta published its first report on how the company avoids contributing to human rights violations.[83]

In a free Metaverse, big tech companies are likely to become highly dominant. If everyday activities such as work, payment, shopping, entertainment and nightlife are transferred to the Metaverse, there must be legislation to safeguard a range of human rights *in* the Metaverse. However, a free Metaverse would be characterized precisely by the absence of entities with overall jurisdiction, i.e. the power and responsibility to make and enforce laws and thereby ensure respect for and secure human rights. The very responsibility to respect and secured human rights would be unclear and fragmented. Therefore, in human rights terms, a free Metaverse would become something akin to a *virtual Wild West*.

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[81] Copenhagen Institute for Future Studies (2022)
[82] UN Guiding Principles on Business and Human Rights (2011)
[83] Meta (2022)

At the opposite end, the Institute envisions a Metaverse controlled and managed by one all-powerful custodian, whether a company, a state or a council. Since the Metaverse is based on data and traceability is at its very core, the option of one Metaverse to rule them all opens the possibility that the custodian of the Metaverse would become omniscient.

 The founder of Epic Games, Tim Sweeney, has predicted that:

> *The Metaverse is going to be far more pervasive and powerful than anything else. If one central company gains control of this, they will become more powerful than any government and be a god on earth.[84]*

If we imagine that our daily activities move from physical reality to the Metaverse, the result could be a realm in which surveillance is not merely pervasive, but total. All data relating to individuals, companies and states operating in the Metaverse could be owned, managed, used – and misused – by the custodian of the Metaverse.

A Metaverse with power to rule over every sub-Metaverse and everything within them would have the advantage that the legal subject accountable for respecting and securing human rights in the meta-realm would be clearly identifiable. The custodian of the Metaverse would be the legal subject responsible regardless of its legal nature - be it a company, state or council. The less good news is that the power of the custodian would be so extensive that existing international enforcement - mechanisms for human rights would be grossly inadequate. The power of the custodian would be almost impossible to circumscribe. One Metaverse to rule them all would be straightforward in terms of legal obligations to respect and secure human rights, but almost impossible to enforce, and therefore at the mercy of the custodian.

Furthermore, existing human rights protections dealing with protection of personal data, protection against surveillance and the right to freedom of expression are likely inadequate for providing appropriate protection in a Metaverse with an omniscient custodian. Individuals, companies and even states will be in the grip of the custodian. Intergovernmental organisations and courts as they are currently set up and equipped will be unable to effectively influence or

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[84] Takahashi, Dean (2016)

pressure the omniscient custodian to respect human rights in ways that would ensure personal autonomy.

In the analysis of the Institute, this scenario seems to be based on the presumption that the custodian will be a rational negotiator, mostly due to market- or efficiency considerations. This is one possibility. But other possibilities exist. This scenario clearly exposes us to the greatest risk of transforming the digital realm into a totalitarian surveillance society. One Metaverse to control them all could deliver a *virtual dictatorship*.

THE NERDVERSE

A less maturely developed Metaverse would likely resemble the internet, albeit integrated with gaming technology. In this scenario, the Metaverse would be accessible to persons and groups with a special interest rather than becoming infrastructure integrated in society as set out in the vision for the Metaverse (see chapter "The Metaverse vision").

In a less extensive Metaverse, different companies and states will offer distinct virtual worlds. The Metaverse will remain fragmented with each segment subject to its own framework. Each provider of infrastructure or services will be responsible for access, use and limitations. In this scenario, the Metaverse would present challenges in human rights terms very similar to those currently existing for the internet. The decisive issue will largely revolve around how states regulate technology and the responsibility of companies not to contribute to human rights violations.

NUMEROUS BETAVERSES

In the last scenario, several different tech companies or states create their own separate virtual betaverses. The company or state in charge will control the framework for activities in their own betaverse. Access will probably be regulated in ways similar to that of borders in the physical world. The legal subject accountable for human rights in each betaverse will be the entity (state or company) responsible for the infrastructure and activity within it. Legal norms and enforcement mechanisms will mimic and reflect those of the physical realm.

In a world with several betaverses, jurisdiction and control in the digital realm will probably correspond largely with that in the physical world. If, for example, a person in Europe is attending a conference in Sao Paolo, we can imagine that the person will need to gain access to Beta Brazil. From a human rights

perspective, a structure where betaverses reflect jurisdiction in the physical world will extend the power and responsibilities of states and companies into the digital realm. Brazil would be legally accountable for Beta Brazil. Anything the person would experience in connection with the conference, or any virtual assets acquired in Beta Brazil, would be legally under the jurisdiction of Brazilian authorities – so too the human rights responsibilities.

The main challenge in this scenario would be the great variance of legal protections in the different betaverses. A bouquet of different norms and enforcement traditions will provide a wide range of diverse betaverses. While some states (or their companies) would have very strict standards and authoritarian enforcement mechanisms in their betaverse, others would be more liberal and emphasise civil and political human rights in their betaverse. Multiple betaverses would allow for a comprehensive distribution of responsibility, but with great variance in standards and enforcement mechanisms, and probably also competition between them. We may assume that betaverses with strong human rights protections would be more attractive to most visitors, customers and jobseekers, and therefore also to companies.

The human rights situation would hence mirror the diversity of human rights situations in the physical world. The difference would be that the technology at the disposal of states and companies would allow for extremely invasive surveillance of users and potentially the population of some betaverses.

This scenario involves numerous challenges from a human rights perspective. States with authoritarian power structures would get a hitherto unimaginable engine and tool for pervasive surveillance of the population with virtual access. Existing human rights challenges linked to political repression would likely multiply both in scope and severity. This, in turn, raises questions about the current human rights enforcement regime. Is it solid enough and appropriately equipped to prevent authoritarian states from relying on the pervasive surveillance offered by the betaverse technology for unlawful purposes? Multiple betaverses would result in a vast number of different virtual worlds, ranging from virtual wild wests to digital dictatorships.

LEGAL INTERACTION AND COLLUSION

A different set of problems for human rights will arise in the intersection between the physical and the virtual realm. Human rights violations in the physical realm will have crossover-effects into the virtual realm, and vice versa.

CONSEQUENTIAL ISSUES FOR RIGHTS IN THE PHYSICAL WORLD

The potential for multiple lives or several digital twins in the virtual world has no correlative in real life. In a recent art project, a creator of the Oculus headset developed a VR headset with the ability to terminate the user's life. The project can serve to illustrate the dilemma of interaction of human rights in and off the Metaverse.[85] If we imagine a game in the Metaverse where digital death will be followed by termination of the user's life in the physical world, the act of the game would be considered as murder in the physical world. Human rights protection entails that the actor responsible for the game in the Metaverse causing an act of murder to materialize on Norwegian soil, would have to be held accountable for murder, even if the 'act of murder' was self-inflicted and voluntary, and was caused by events in the Metaverse. In order to safeguard the right to life, entering into agreements about murder or suicide, including murder as 'punishment' or 'reward' is prohibited in Norway.

Despite clarity of law, significant problems could arise with respect to enforcement. How can those responsible for the murder be prosecuted in Norway, if the person offering the deal is an individual residing in Brazil, operating on behalf of a company registered in a tax haven under a "shell person" with an address in Antarctica. The matter is further complicated if the murdered Norwegian paid virtually for access to the game using money earned from a company in the Metaverse, i.e., if the contract was entered into in the Metaverse, and paid by money earned in the Metaverse. The only link to Norway would the physical result (death).

The murder of a Norwegian citizen in Norway entails that Norwegian authorities are responsible for investigation, criminal prosecution and punishment in case of conviction in order to safeguard the right to life in Norway. If enforcement is complicated or impossible, do Norwegian authorities have other options than blocking Norwegian citizens' access to such virtual games? And in order to enforce such a ban, would Norwegian authorities need to track and

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[85] Wong, Dale John (2022)

monitor Norwegian citizens' activities in the Metaverse, or would it be sufficient to prevent the said gaming products from physically entering the country through import controls? In order to safeguard fundamental rights in Norway, government authorities will likely need to restrict access or conduct significant monitoring and surveillance of the activities of Norwegian citizens in the Metaverse.

THE RIGHT TO PRIVACY FOR VIRTUAL AND NATURAL PERSONS

Data collected in relation to your virtual person in the Metaverse can include track records from the Metaverse, profiling your personal traits, political preferences and antipathies based on your virtual patterns of action and digital history. This could be complemented by biometric data about your physical and mental state assembled through the technological means used to bridge the physical and virtual reality. Highly sensitive data relating to your person could be collected, analysed and processed in order to map your physiological and mental characteristics. The nature and intrusiveness of such biometric data could increase the risk of human rights violations in the physical realm. The surveillance risk from the Metaverse would therefore likely spill over into the physical world.

Difficult questions will arise regarding the management of your own personal data. Can "consent" be used as the basis for processing at all if Metaverse users do not understand what data they are giving up and how such data could be used? The current international and national legal regimes on data protection and the human right to privacy are in no way calibrated for the challenges the Metaverse is likely to bring concerning protection of personal autonomy in both the virtual and the physical realms.

ACCESS TO THE METAVERSE – AND A DUTY TO PARTICIPATE?

A new type of rights would relate to natural persons' access to and exclusion from the Metaverse. If the virtual world becomes increasingly integrated with everyday life, access to the Metaverse would become a human rights issue. Can you be obliged to work or study in the Metaverse and what would the consequences be if people refuse to engage with the Metaverse? Do governments have a duty to ensure that all citizens have access to the Metaverse, including groups that are vulnerable due to age, disability and the like? And according to which criteria may natural persons be excluded from entering or even existing in the Metaverse?

If government authorities chose to move activities to the Metaverse, what responsibility would the state assume for the risks to human rights, and does this responsibility extend to both predictable and unintended effects for human rights? Many challenging human rights issues will arise in the wake of the Metaverse, not unlike the effects of the digitalization of the last decade.

Unlike the internet, however, the virtual reality of the Metaverse is likely to increase the geophysical connection with the physical realm, giving rise to more fundamental questions about jurisdiction, responsibility and enforcement of human rights.

FREEDOM OF OPINION AND EXPRESSION IN RELATION TO OTHER RIGHTS

The Metaverse will facilitate new ways for human beings to interact. This entails that violations of human rights associated with the internet, such as privacy violations, harassment, threats, hate speech, etc., could become more prevalent. Such effects are already visible in VR:

> *The Extended Mind produced a study of the experiences of women in social VR. The results were not surprising and quite discouraging: 49 percent of women reported experiencing at least one incident of harassment in VR. Many of them never went back to the virtual experience. The harassing results were not just limited to women, as 30 percent of male respondents reported racist or homophobic content, and 20 percent experience violent comments or threats on the platform.*[86]

Human rights violations such as these would have the same impact in reality as online speech has today, possibly with greater psychological effects, as violations will be experienced more realistically in the Metaverse compared to the internet. Although the Metaverse may be perceived as separate from the physical world and could therefore be perceived more like playing a game, the subjective experience of digital harassment and abuse will likely be more reminiscent of violations in the physical world.

Trolling, disinformation and manipulation could also increase in scope and severity with the advances in technological tools. This technology would also be available to states, companies and other parties with malicious intentions. Technology that provides insight into the vulnerabilities of individuals and

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[86] Heller, Brittan (2021)

groups can be abused and expose the public to extremely targeted information campaigns. The Metaverse will likely offer more sophisticated forms of manipulation, disinformation and means of political influence. The human rights challenges that we have experienced in recent years with the arrival of the internet and social media, are most probably only a prelude for things yet to come.

How these challenges will be addressed largely depends on the form and structure the Metaverse will eventually take. This, in turn, will be decided by how and to what extent government authorities take control over the Metaverse for their citizens, and which new categories of rights we choose to develop in order to safeguard the personal autonomy of human beings in the virtual (and physical) realm, in the advent of the Metaverse.

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