
# METAVERSE DELPHI STUDY

**A delphi study on the development of the metaverse towards 2030**

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*This delphi study was designed, prepared, facilitated and analysed by Sofie Hvitved, Bugge Holm Hansen, Simon Fuglsang Østergaard, Klaus Mogensen, Maya Ellen Hertz and Philipp Heideker*

*Design and editorial by Sara Frostig, August Leo Liljenberg and Celine Vang*



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*If you have any questions or comments, you are welcome to reach out to Futurist, Senior Advisor and Head of Media, Sofie Hvitved, shv@cifs.dk.*




COPENHAGEN INSTITUTE FOR FUTURES STUDIES

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# Executive summary

This is the first-of-its-kind global delphi study seeking to source the collective knowledge and perspectives of a diverse panel of experts on the future of the metaverse. We curated a diverse panel of experts involved with the metaverse to assess a series of hypothesis and propositions in relation to the future of the metaverse towards 2030: What it is, what will it become, when it will be implemented, how impactful it will be, what it will be used for, and much more.

- The metaverse is already here! At least to some degree. That's the consensus reached by the expert panel, even though it's a very early version. We are seeing fractions today of what will eventually become the metaverse, but it will still take some time for it to fully arrive.

- A mature metaverse from a technological point of view (as defined by Gartner) is still some way off. A mature metaverse might lie at least 5 or even 10+ years into the future.

- The advent of the metaverse is expected to be highly impactful on society towards 2030, with a mostly optimistic outlook on the nature of this impact, and the potential to revolutionise the way we live, work, play and express ourselves.

- When trying to assess how the metaverse could unfold towards 2030, we need to consider both drivers that catalyse and blockers that limit the development of the metaverse. Main drivers include advances in new tech expanding technical possibilities of the metaverse, heavy investments by the tech industry, as well as younger, more tech-savvy generations leading the way. Main blockers include lack of interoperability and competing standards, and poorly designed user experiences and user tech fatigue.

- While most panellists favour a metaverse that is open, decentralised and democratic, a significant portion believe it will be centralised and proprietary, with one or a few dominant commercial actors.

- Too heavy political or corporate intervention and control may limit functionality. However, too little regulation could also make users fear for their privacy and security, and lead to a less positive, empathetic, and healthy culture in and around the metaverse.

- By 2030, our virtual and physical worlds may have merged in a way that we freely navigate between them in our daily lives, with AR and VR technologies becoming more accessible and affordable, and with users becoming more comfortable and confident in living immersive digital experiences. Sceptics believe in this vision but think it will take longer.

- By 2030, it will be as essential for commercial brands to have a presence in the metaverse as it is to have a webpage today.

Read much more and see all findings in the report.

# Introduction

The groundwork for the development of the metaverse is being laid as we speak, but as with any emerging field, there are many different views of what the metaverse is, what it encompasses and what it will become. Nobody can know for sure how the metaverse will unfold and what implications it will bring – but we can do our best to anticipate and prepare.

That was the outset for us – the Copenhagen Institute for Futures Studies – to undertake this delphi study, as the first-of-its-kind global delphi study aiming to advance the overall understanding of the future of the metaverse – as users, as businesses, and as policymakers. Hence, with this study, we wanted to challenge and provide different perspectives on the development of the metaverse to get a deeper understanding of how the future of the metaverse may unfold and what implications it can bring to our lives and our society as a whole.

At the Copenhagen Institute for Futures Studies, we believe that the metaverse is a concept that we need to dive deeper into when it comes to possible futures. Rather than defining what it is today, we find it more productive to explore and investigate what it might become tomorrow. Once the technologies and use cases supporting the concept have matured, the metaverse has the potential to revolutionise our society. We are already working intensively on the future of the metaverse, and this delphi study can add to that.

The study was carried out in Q4 of 2022 with a diverse panel of 66 of the world's leading metaverse experts. On the following pages you will find a thorough explanation of the delphi method as a collaborative foresight method, followed by the delphi outcomes and panel insights, synthesised by CIFS experts.

We hope you enjoy reading and that you find this publication equally insightful, inspiring, and thought-provoking.

# What is a delphi study

## ABOUT THE DELPHI METHODOLOGY

A delphi study is a collaborative foresight method designed to elicit consensus building among a panel of experts on a series of future hypotheses and propositions. The method is based on the principle that the collective wisdom and foresight from a carefully selected group of experts – the delphi panellists – provide superior insights and orientation around potential future developments compared to individual judgements. This is especially true when dealing with complex areas with a high degree of uncertainty – such as the future of the metaverse.

The key to a successful delphi study lies in establishing the right panel. This can be tricky, as one wants to include people who are likely to contribute with valuable insights and perspectives, while also representing diversity of opinion. Quality delphi outcomes can only be generated by a panel that brings diverse opinions, fresh perspectives, and considerations to the table in as non-partisan a manner as possible to facilitate new perspectives and potential nexuses concerning future developments.

At its core, the delphi method is a controlled debate carried out over a series of iterative survey rounds, where panellists are exposed to the other experts' insights and reasoning which will nuance their own understanding of the specific topic area. Consequently, a delphi study does not (and is not intended to) produce statistically significant results across a representative sample. It represents the synthesis of opinion of the group of panellists – no more, no less.

The Metaverse Delphi Study consisted of two rounds: in the first round, the panellists anonymously considered and responded to a range of hypotheses and propositions concerning developments in the future of the metaverse. All hypotheses and propositions were carefully prepared by CIFS experts. The panellists were prompted with the importance of providing elaborate argumentation for their choices for the other panellists to consider in the following round. After the first round closed, panellists were encouraged to revisit in a second round and potentially re-evaluate their own initial responses, considering the current consensus (the panels' overall opinion) and arguments from other experts, thus facilitating consensus. A delphi panel will usually move towards some level of consensus over several rounds; but even when this does not occur, the reasons for disparate positions and any high level of uncertainty become crystal clear.

## PANEL LIMITATIONS

Delphi studies are difficult to do well. A great deal of attention must be given to the choice of panellists, and the future hypotheses and propositions must be meticulously prepared and tested to avoid ambiguity. Even though we have done our best in putting together a knowledgeable and diverse panel, it will never be possible to eliminate all sources of bias. Besides the many biases and fallacies that are always present when working with the future, a few limitations in should be considered.

Firstly, we expect a degree of optimism bias in the outcomes. Most of the panellists either work professionally with or have a vested interest in the metaverse, which may generally lead to consensus outcomes that lean more towards the positive side of the issue.

Secondly, in an expert panel like ours, there will almost always be some degree of confirmation bias. Especially when revisiting the second round of the delphi, some might find it difficult to let go of their initial position, and they may indirectly give more consideration to arguments that support their pre-existing position while dismissing perspectives that contradict them. This makes it more difficult to elicit panel consensus. This bias can be very strong, especially in relation to issues where people have a vested interest.

Thirdly, the development and overall understanding of the metaverse are largely in their infancies. The term 'metaverse' is often used without a definition, and definitions can be rather vague. This will automatically lead the panellists to be anchored in their own personal understanding of what constitutes the metaverse, which in turn will colour their assessment and reasoning around the future of the metaverse. That being said, part of the reason for carrying out this delphi is exactly to take steps towards a stronger common understanding of what constitutes the metaverse.

## HOW DO WE MEASURE PANEL CONSENSUS?

How panel consensus is measured in technical terms depends on the response scale that a specific hypothesis follows. Most hypotheses in the delphi followed a 5-point Likert scale[1][1]; however, some future propositions were not framed as hypotheses and hence followed non-Likert scales. The panel consensus pick (the future outcome that panel consensus converges towards) and the group stability measure (how strong the consensus is) are determined in different ways depending on the response scale:

### 5-point Likert scale:

- *Consensus measure:* The consensus pick is determined by the **arithmetic mean** of all responses.
- *Group stability measure:* The strength of the consensus is determined by the **coefficient of variation**[2][2] across all responses.

### Non-Likert scales:

- *Consensus measure:* The consensus pick is determined as the response option with **most** responses.
- *Group stability measure:* The strength of the consensus is determined by the **percentage function**, i.e., how large a percentage share chose the consensus pick.

The higher the stability measure, the stronger the consensus in panel. As a general rule, a group stability above 50 % constitutes a good degree of consensus. However, in our delphi study, we have set the consensus threshold at 60 %, meaning that the panel reached a consensus pick on hypotheses and propositions with a group stability above 60 %. The relatively high consensus threshold is set to try to accommodate the suspected optimism bias in the panel, as discussed earlier.

[1] A Likert Scale is a type of rating scale used to measure attitudes or opinions on a continuous scale, e.g. from "strongly agree" to "strongly disagree", or "very likely" to "very unlikely".

[2] The coefficient of variation is a statistical measure that shows the extent of variability in relation to the mean of the population.

# Definition of the metaverse

There are many different views of what the metaverse is and what it encompasses. Therefore, a single definition will never completely satisfy everyone. However, to ensure a common basis for assessing the future hypotheses, we have decided to use the following definition of the metaverse as a guideline for the delphi study.

**Definition of the metaverse used in the study:**

# The metaverse overall is the seamless convergence of our physical and digital lives that will bring people, spaces, and things together in virtual or augmented digital worlds.

# This includes augmented visual layers added on top of our physical reality as well as virtual worlds.

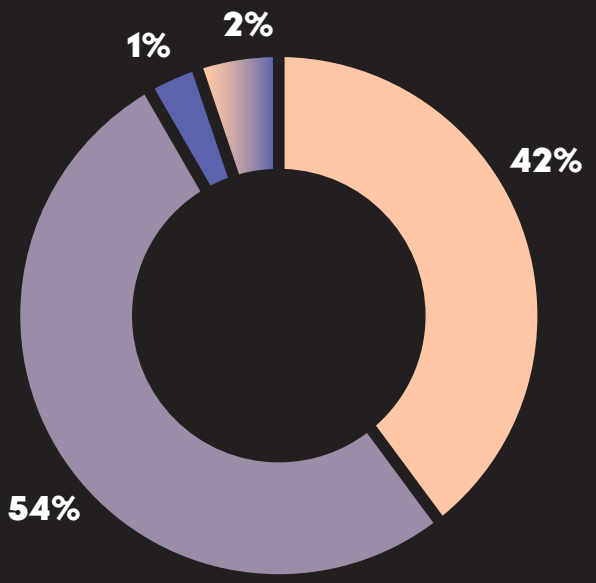
# Panellists

The expert panellists have been carefully vetted and the panel has to the best extend possible been assembled based on a diversity of backgrounds, perspectives, and opinions – from thinkers and creatives to entrepreneurs and practitioners working in the field.

The main ”design criteria” when assembling the panel was to introduce as little bias as possible. However, there might be a slightly disproportionate representation of panellists being either male, European or in the 31-40 age bracket.

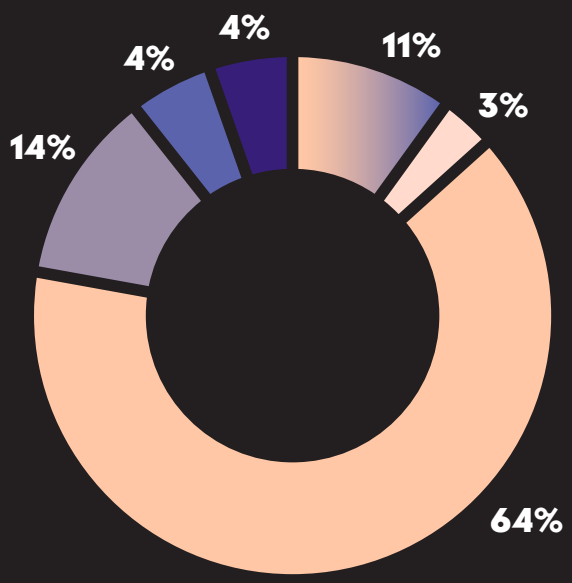
## Experts

## GENDER



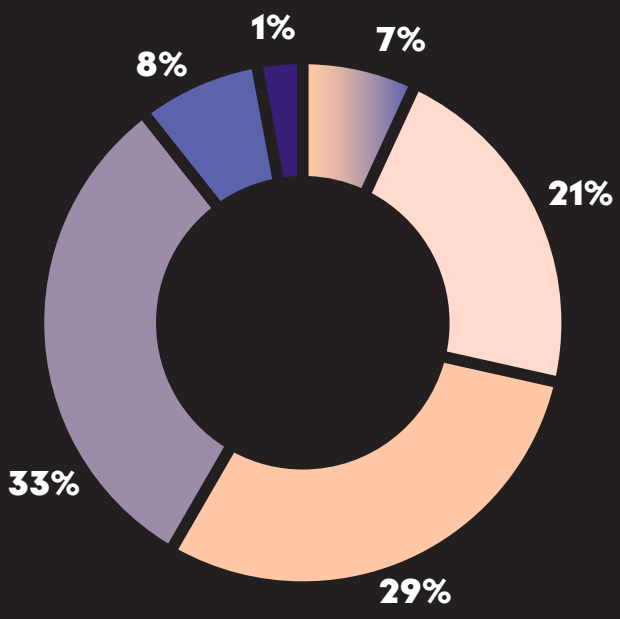

- FEMALE
- NON-BINARY
- MALE
- OTHER

## GEOGRAPHY



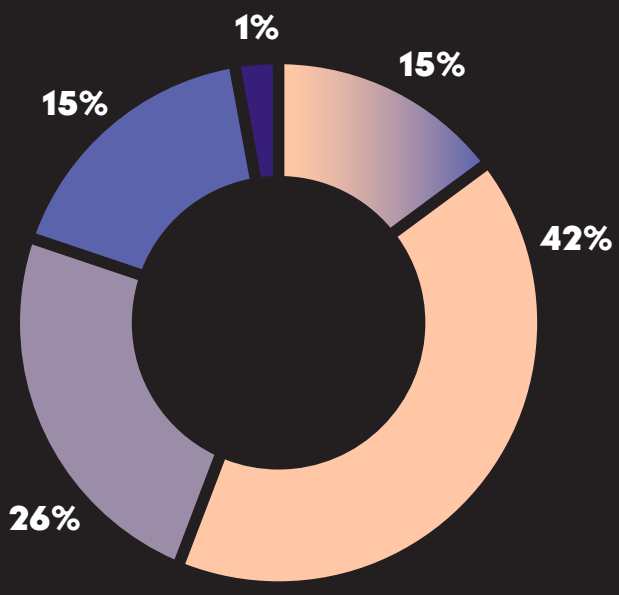

- ASIA
- NORTH AMERICA
- AFRICA
- OCEANIA
- EUROPE
- SOUTH AMERICA

## PROFESSIONAL AFFILIATION




- ACADEMIA
- ENTREPRENEUR
- ARTIST/WRITER/THINKER
- OTHER
- BUSINESS/ CORPORATE
- REGULATORY/ POLICY

## AGE




- UNDER 30
- 51-60
- 31-40
- 60+
- 41-50

# THE RESULTS FROM THE DELPHI STUDY

The following pages present the actual results from the delphi study – the panellists' responses as well as their elaborate argumentation. For each question, we present the panel's overall responses, the panel consensus pick (the future outcome that panel consensus converges towards) and the panel consensus strength. We also present a summary write up of the panel's perspectives and opinions, while also providing direct quotes with interesting points. Some direct quotes are abbreviated or lightly edited for grammar and clarity.

The delphi study consisted of a total of 20 wide-ranging hypothesis, questions and propositions related to the future of the metaverse. At least 62 of the 66 panellists have answered each question. For the second round of the delphi, where panellists had the opportunity to revisit and re-evaluate their initial responses considering the current consensus (the panels' overall opinion) and arguments from other experts, 43 panellists returned, and 37 revisited all answers.

# How to read the delphi results

The overall objective of any delphi study is to elicit consensus among a panel of experts on future outcomes when dealing with complex areas with a high degree of uncertainty – such as the future of the metaverse.

When reading the results on the following pages, there are three main things to look for:

## 1. Is there consensus in the panel?

The future outcome on which the panel as a whole find consensus. This is what is stated as the "panel consensus pick". Be aware that this is *not* necessarily the same as what the majority pick of the panel, and if the consensus is not strong enough (in technical terms), we cannot conclude on a panel consensus pick – then there is essentially dissensus in the panel.

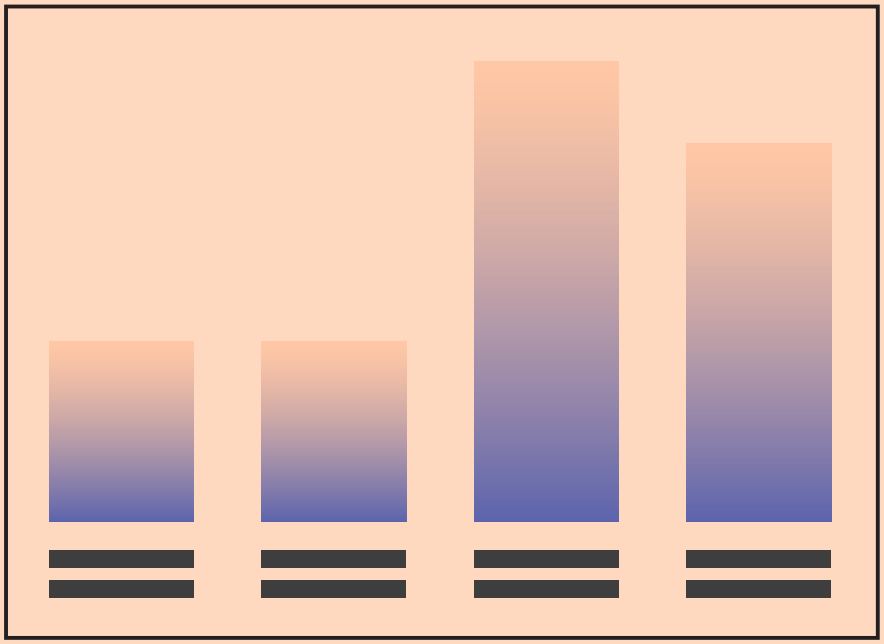
## 2. The strength of consensus

How strong is the consensus? The consensus threshold is set at 60%, i.e., if we are above 60%, we can conclude on a panel consensus pick, but if we are below 60%, we cannot conclude on a panel consensus pick.

## 3. The distribution of responses across all panelists

How many said what? This is what the graphs show you, like in any other "ordinary" survey.

*You can read more about the technical details and considerations on how we measure panel consensus in the methodology section on page 6-7.*



**Question 1:**

# What key aspects must be included in the definition of the metaverse in your opinion?

The panellists' definitions and descriptions of the metaverse tend to focus on how the technology could work and what it could do, not so much what it will be used for and who will own it, who will create the content for it and who will use it. At this early stage, definitions of the metaverse are constantly changing and adapting to the evolution of it.

The metaverse is seen as a concept that embodies the next iteration of the internet, built on top of the current iteration, likely with added Web3 functionality, where people interact using avatars in a shared world-spanning, real-time, synchronous, and persistent virtual reality, with our digital lives syncing with our physical lives. AR, VR, XR and/or MR is used to expand the user experience to make interaction more immersive, offering hyper-social experiences with real-time experiences where individuals can interact, work, play and learn with each other within the virtual world.

The term metaverse is a contested future vision, claimed by different perspectives and motivations. Some panellists see the metaverse as a parallel universe created by humans with the help of technology, others as a digital layer seamlessly integrated with the physical world, where augmented reality merges the virtual with the physical, a 'spatial web' which interweaves and converges all aspects and strands of our physical and digital worlds, incorporating contextuality, geolocation and gamification.

The future may see one dominant metaverse or several metaverses that pull the concept in different directions. The metaverse or metaverses may be owned, centralised, and walled in, with little empowerment for users, or democratised, decentralised and open, based on open-source protocols. The vision of the open metaverse is one that is community owned, decentralised, interoperable, and guarantees privacy by design.

The metaverse could unlock a new creative, financial, and technological renaissance with a joint-value creation model, creating new economic opportunities in both the digital and the real world with new economic models and revenue streams.

*"I believe that our universe and the metaverse are essentially the same thing. Both are simulated realities. Both have strict rules. The same input always means the same output. Well – both are chaotic. Currently the only main difference is the simulation computing capacity. If we have sufficient computing power, we can simulate metaverses as detailed as the universe."*

**ENTREPRENEUR/START-UP, THE NETHERLANDS, 31 – 40, MALE**

*"I would not use upper case - Meta-verse - as if there is only one. There are many metaverses and thus lower case. Many people think that there is one, and that is Meta's. Pretty annoying that Meta stole the word."*

**ARTIST/WRITER/ THINKER, DENMARK, 51 – 60, FEMALE**

*"In my opinion, the metaverse (as a concept), compared with many metaverses (as implementation), is more of a seamless extension of a physical world."*

**ARTIST/WRITER/ THINKER, BELGIUM, 51 – 60, MALE**

*"One could consider accessibility (which already is implied in the word 'seamless') as well as whether interoperability is needed in order to 'truly' be metaverse."*

**ARTIST/WRITER/ THINKER, DENMARK, 41 – 50, FEMALE**

*"The metaverse enables shared expe-riences across both the physical and digital worlds, connecting users to others around them, either through augmented physical things or through purely digital experiences."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

**"In my opinion, the Metaverse (as a concept), compared with many metaverses (as implementation), is more of a seamless extension of a physical world."**

**ARTIST/WRITER/THINKER, BELGIUM, 51 – 60, MALE**

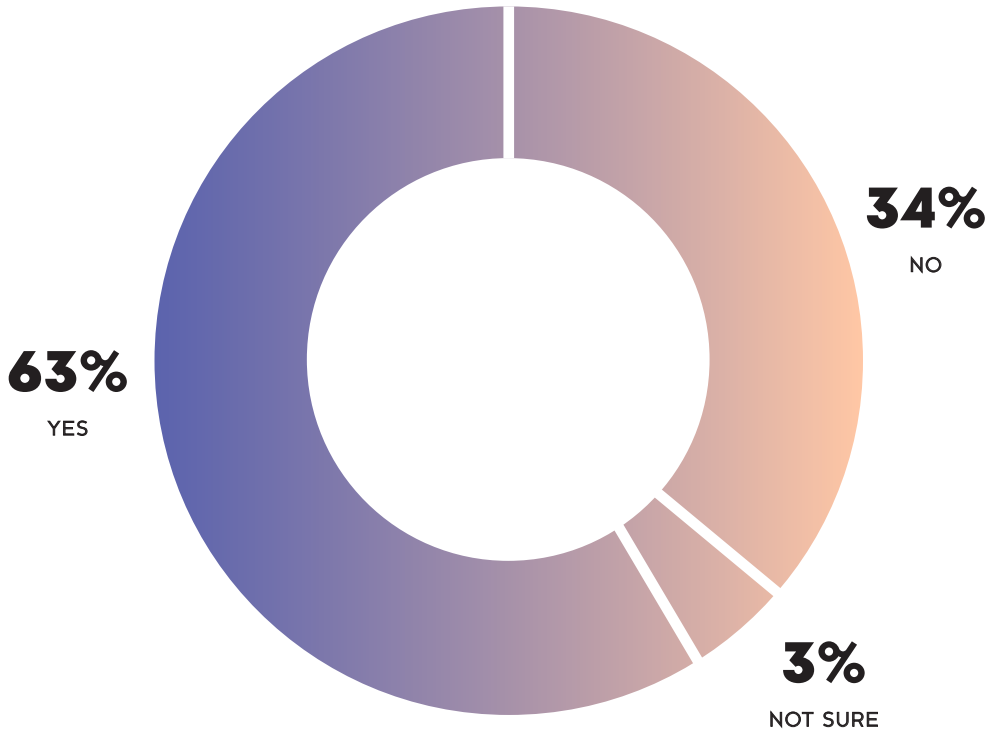
Question 2:

# Does the metaverse already exist in some form or another?

## YES

***Panel consensus pick***

***(Consensus strength 63%)***



*"It's very early but we already see the seeds starting to sprout. Think about the Internet in the early 80' - we are now 40-50 years after the early internet. The acceleration of the metaverse will be much quicker than what we've seen for the Internet. Within 10-15 years half the population on earth will be connected within the metaverse."*

**ENTREPRENEUR/ START-UP, ISRAEL, 41-50, MALE**

*"We are far and close at the same time, everything that is being sold as a metaverse, simply is not, the immersion between the digital and virtual will make it possible to believe in the metaverse. In short: Decentraland, Roblox, Monaverse, Spatial... are not metaverses."*

**ARTIST/WRITER/ THINKER, PERU, UNDER 30, MALE**

*"I believe there is already a coexistence of physical and digital worlds, but for me this is very different to the Capital M 'metaverse' which I see as a distinct near future entity. Whether the transitions form todays hybridity into the metaverse will be seamless and/or tangibie remains to be seen. Will there be a'ribbon cutting ceremony' to open the metaverse? But people are already building it... so in thats sense in technical terms I suppose it does exist."*

**ACADEMIA, UK, 31-40, FEMALE**

*"The metaverse does not currently exist, but some pieces of it and a few proof of concepts have been built."*

**BUSINESS/CORPORATE, US, 31-40, FEMALE**

**"We're currently finetuning the blueprints for the metaverse. Computing power that allows for an unlimited amount of participants currently doesn't exist, nor does the seamless transitioning between worlds or the ability to move assets seamlessly across worlds/ virtual spaces exist at the moment. These fundamental features that currently lack are the foundations of the metaverse."**

**ENTREPRENEUR/START-UP, THE NETHERLANDS, 31 - 40, MALE**

63% of panellists believe that the metaverse already exists in some form, while 34% don't believe so. 3% remain unsure about it.

To support the idea that the metaverse already exists, several panellists referred to virtual worlds like Second Life, World of Warcraft, Minecraft, The Sandbox, Horizon Worlds, and more. These worlds are visited as an avatar interacting with other avatars, and in many of these, you can buy and sell virtual or even real-world products and services using a virtual currency, which in some cases can be exchanged for real-world currencies.

Whether the metaverse exists today depends a lot on what are considered necessary features of the metaverse. As one panellist puts it: "If one is entirely offline, or not using social media in any way, then perhaps they are not yet part of the metaverse, but otherwise I think we are all in the initial stages of the metaverse."

Others point out that we are still a long way from having the technology to create a metaverse like that envisioned in e.g., Neal Stephenson's 1992 novel Snow Crash. We lack the computing power and the connectivity to handle an unlimited number of participants in a unified virtual 3D world, and we lack the seamless transitioning between worlds or the ability to move assets seamlessly across worlds/virtual spaces. By this understanding, the true metaverse will not exist until virtual worlds are interconnected with portals, like web pages are interconnected with hyperlinks. While interoperability isn't a prerequisite for the metaverse, without it, we will be working in separate silos – a web2 situation that doesn't offer the decentralisation offered by Web3.

The transition to the metaverse is gradual, and it may be impossible to determine exactly when we have 'ticked all the boxes'. Quote: "Will there be a 'ribbon cutting ceremony' to open the metaverse?

Question 3:

# The mature metaverse* will emerge on the following horizon

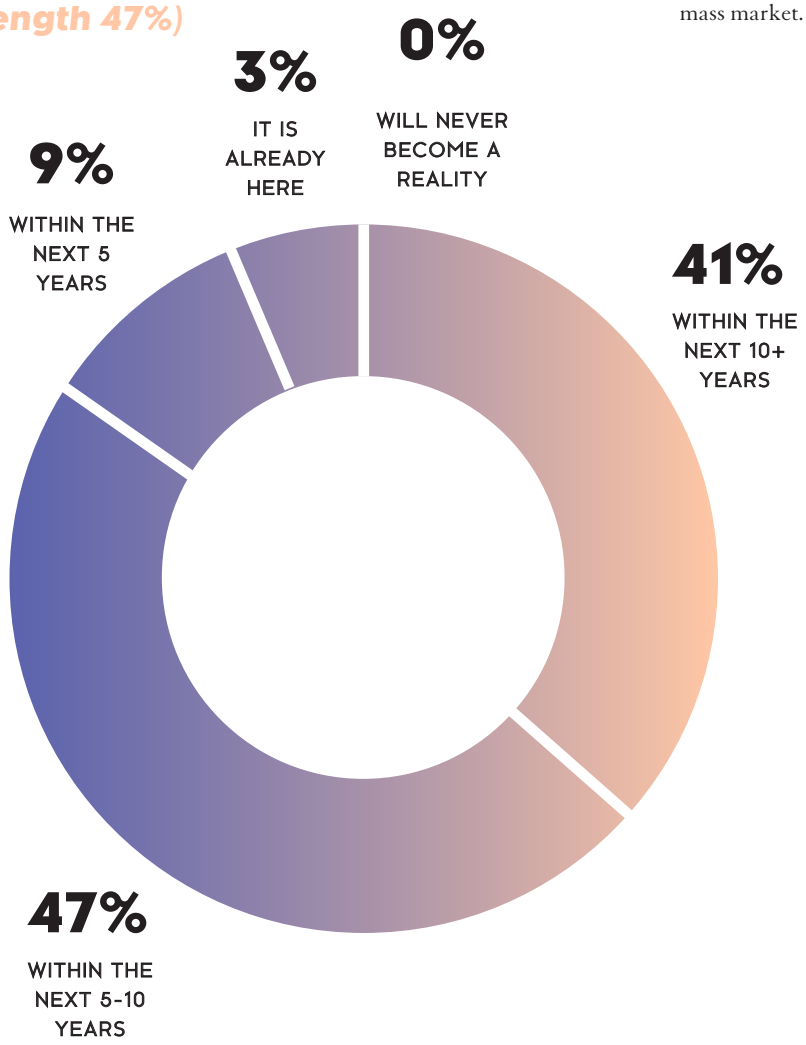
* According to Gartner, the development of the Metaverse from a technological point of view will follow three subsequent stages:
1) An emerging Metaverse,
2) an advanced Metaverse, and
3) a mature Metaverse.

The mature Metaverse relies on the maturation of adjacent technologies from the two earlier phases. Hence, a mature Metaverse will only be reached when these reinforcing technologies are fully developed, interoperable and adopted by the mass market.

## No consensus

***Panel consensus pick***

***(Consensus strength 47%)***



*"We're currently finetuning the blueprints for the metaverse. Computing power that allows for an unlimited amount of participants currently doesn't exist, nor does the seamless transitioning between worlds or the ability to move assets seamlessly across worlds/ virtual spaces exist at the moment. These fundamental features that currently lack are the foundations of the metaverse"*

**ENTREPRENEUR/ START-UP, THE NETHERLANDS, 31 - 40, MALE**

*"This will depend on where you live in the world. High speed internet access is needed, and much of the world does not have this."*

**BUSINESS/CORPORATE, SOUTH AFRICA, 31-40, FEMALE**

*"I don't believe that high-end VR/ AR/XR is a critical component of the metaverse. It is an important component which promotes values of metaverse and extends the immersion aspect greatly, but immersion can be achieved without it. We need to differentiate between full immersion and immersion; for the metaverse, full immersion is not required."*

**ENTREPRENEUR/ START-UP, SLOVAKIA, UNDER 30, MALE**

*"I do not believe in the Gartner three subsequent stages. Like the internet, the metaverse will never be finished and ultimately be transformed into other concepts in line with technology advancements and social changes."*

**ARTIST/WRITER/ THINKER, BELGIUM, 51 – 60, MALE**

*"We need to work towards self-sovereign identity solutions as well as sovereign wealth. Interoperability is key because the Metaverse is not a destination. It's an endless network of connected devices, platformsplatforms, and systems, all able to interact automatically via interoperability and security standards."*

**ARTIST/WRITER/ THINKER, AUSTRALIA, UNDER 30, FEMALE**

3% of panellists believe that a *mature* metaverse, as defined by Gartner, is already here, while 9% think we will get it within the next 5 years. The majority foresee a longer time horizon, with 47% believing we will have it between 5 and 10 years from now, while the remaining 41% believe that it will take more than 10 years.

Panellists believe that the metaverse will not be truly mature if people just use it for distinct activities, such as learning, playing, shopping or travel. It will only be mature when everyone uses it for all daily activities: when they socialise, shop, entertain, and learn in the metaverse as much as they physically do these things. This level of usage is only expected for the younger generations, Gens Z and Alpha, which embody the necessary mindset shift.

According to some panellists, the timeframe of the metaverse depends on how much big players decide to invest into it. A mature metaverse will require a defragmentation of the current corporate silos. Will the existing conglomerate easily accept that this fragmentation evolves to a coherent universe where all of them coexist on equal footing? There needs to be a significant shift in the capitalistic proprietary approaches to technology before this ideal of the metaverse can emerge.

The timeframe for the emergence of a mature metaverse depends on the pace of development, adoption, and integration of a wide range of technologies, such as virtual reality, augmented reality, artificial intelligence, blockchain, and the Internet of Things, among others. It is difficult to pinpoint a specific timeline as the development of such complex technologies and their integration with one another is an ongoing process. We still have a long way to go when it comes to the 'smoothness' of the metaverse. It is still clunky and requires special equipment that is not accessed on a broader level.

A lot of the immersion, spatial computing and other compute heavy applications can be severely delayed in scale and adoption because of supply chain issues in the chip market. There may be too many technical challenges to solve within 10 years, and too many stakeholders involved. Nor do we know the future extent and impact of the current recession, which may also delay the metaverse. It also depends on the establishment of a regulatory scaffolding and interoperability standards. Environmental factors, such as climate change, will also play a part in the trajectory of a mature metaverse and the development of the technology that will support it.

A mature metaverse doesn't just depend on technology but also on uptake. We are still learning how exactly to create the best user experience, user interface and functionality moving forward, and until that is achieved, advancement of the metaverse will take time, effort and thought. However, creative people have shown interest in exploring the metaverse and its opportunities. With creative people collaborating with technical people, the products will become more user friendly and advanced, which may hasten the adoption of the metaverse. Generative AI may also push the evolution of the metaverse into motion faster than many predict.

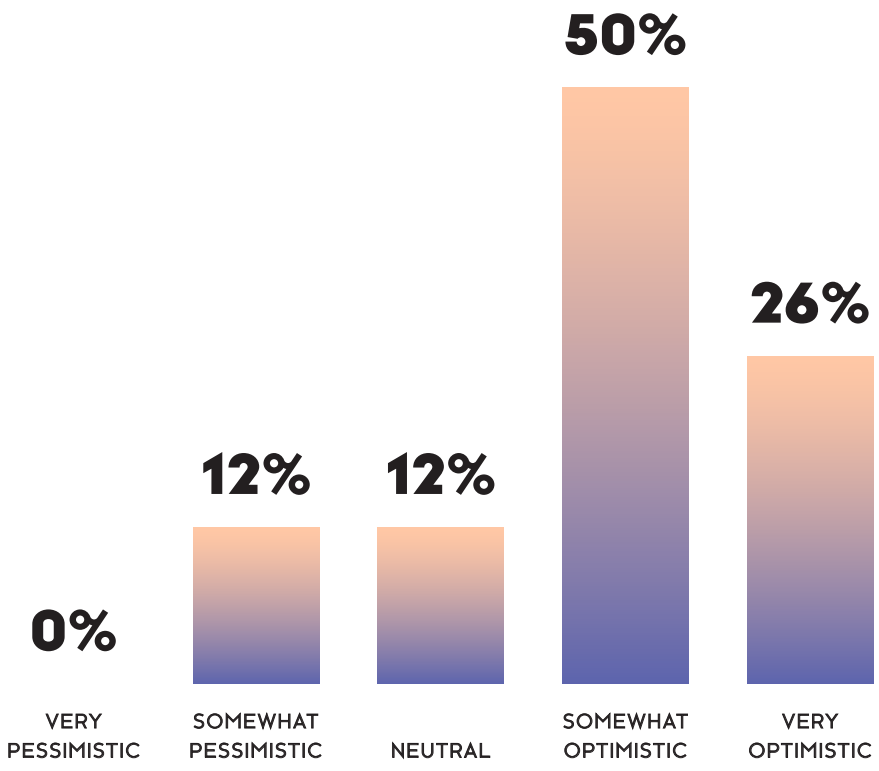
Question 4:

# When considering the nature of the metaverse's impact on society towards 2030, your overall attitude is

## Somewhat optimistic

***Panel consensus pick***

***(Consensus strength 76%)***



*"The Metaverse can be interpreted as humanity's greatest art project as it tests us a species and a society to reconfigure power structures, hierarchies and financial models where we place accessibility, democratisation, inclusivity, and diversity at the forefront of the Metaverse experience. The outcome of the Metaverse will ultimately reflect our values and philosophies of where we are at as a society."*

**ARTIST/WRITER/THINKER, AUSTRALIA, UNDER 30, FEMALE**

*"We already spend a lot of our time in an immersive and technological world. Having all of them in just one place for me it is positive because it will avoid distraction from such different initiatives."*

**EENTREPRENEUR/START-UP, BRAZIL, 51 – 60, FEMALE**

*"Social media gave us filter bubbles, the Metaverse will give us reality bubbles. By using generative AI everybody has the power to create its own alternative reality."*

**ARTIST/WRITER/THINKER, THE NETHERLANDS, 51 – 60, MALE**

*"To build a sustainable metaverse, we should focus a little less on realism and immersivity and more on decentralisation and value creation/disintermediation. Otherwise, the metaverse will be nothing else than The Sims on steroids. Still pretty cool, but pretty useless as well."*

**BUSINESS/CORPORATE, ITALY, 41 – 50, MALE**

*"I believe if you want to create a utopian society you have to start off with a utopian and optimistic mindset as well as taking on board and learning from the mistakes humanity has made in the past. In this respect, one of the things that makes me optimistic is web3. While not required to feature in any definition of the Metaverse, the association between the Metaverse and web3 is so ubiquitous that it is difficult to imagine a future where the two are not intertwined."*

**OTHER, INDIA, 31 – 40, FEMALE**

**"The Metaverse can be interpreted as humanity's greatest art project as it tests us a species and a society to reconfigure power structures, hierarchies and financial models where we place accessibility, democratisation, inclusivity, and diversity at the forefront of the Metaverse experience. The outcome of the Metaverse will ultimately reflect our values and philosophies of where we are at as a society."**

**ARTIST/WRITER/THINKER, AUSTRALIA, UNDER 30, FEMALE**

The panellist's overall attitude towards the metaverse is positive. 50% are optimistic, 26% very optimistic, with 12% being neutral and another 12% being pessimistic, though none are very pessimistic.

Panellists generally believe that the ability to engage in virtual space will highly benefit some people. There is a true opportunity to level the playing field and enable more people to engage and determine the structure and nature of our society more actively. With the emergence of a mature metaverse, we could see the emergence of more immersive and interactive experiences. The metaverse could be extremely engaging, more personalised, more friendly, and more fun. The metaverse could offer a wide range of opportunities for individuals and organisations to connect, create, and innovate in a virtual space, unlocking new possibilities for growth, social interaction, and communication. People suffering from dementia or Alzheimer's might get treatment via experiences in the metaverse. The open metaverse, if we can secure one, would enable us to be truly borderless, providing an opportunity for greater human interaction and integration. Crossing wide geographic boundaries and creating hybrid models of interaction would give us some resilience in the face of crises and provide us with opportunities to scale expertise and competence across these boundaries.

Ultimately, the metaverse has the potential to revolutionise the way we live, work, and play in the coming years. All this will fundamentally impact how society is constructed and operated and governed. However, until we can make this technology available for everyone, the effect is not going to be very profound. The real consequences of this technology will become obvious only once a generation raised in a world with a ubiquitous metaverse reaches productive age.

As with all technology, there will be some incredibly beneficial uses of the metaverse and some detrimental ones. The metaverse could be a massive divider between those who can afford it and those who cannot, widening the economic inequalities already present in many places. We should be concerned about the extreme power that metaverse platforms could have over the lives of consumers. The metaverse will allow large platforms and bad actors to track everything that their users do, say, see, and experience throughout their daily lives and then manipulate the world around them for various purposes. We do not want a repeat of web2 in terms of manipulative data harvesting, algorithmic filtration bubbles, and corporate greed. Without regulation, the metaverse could become the most powerful tool of persuasion and manipulation ever created. This makes it even more important with guidance, education and constant reflection with the responsibilities for regulators and builders.

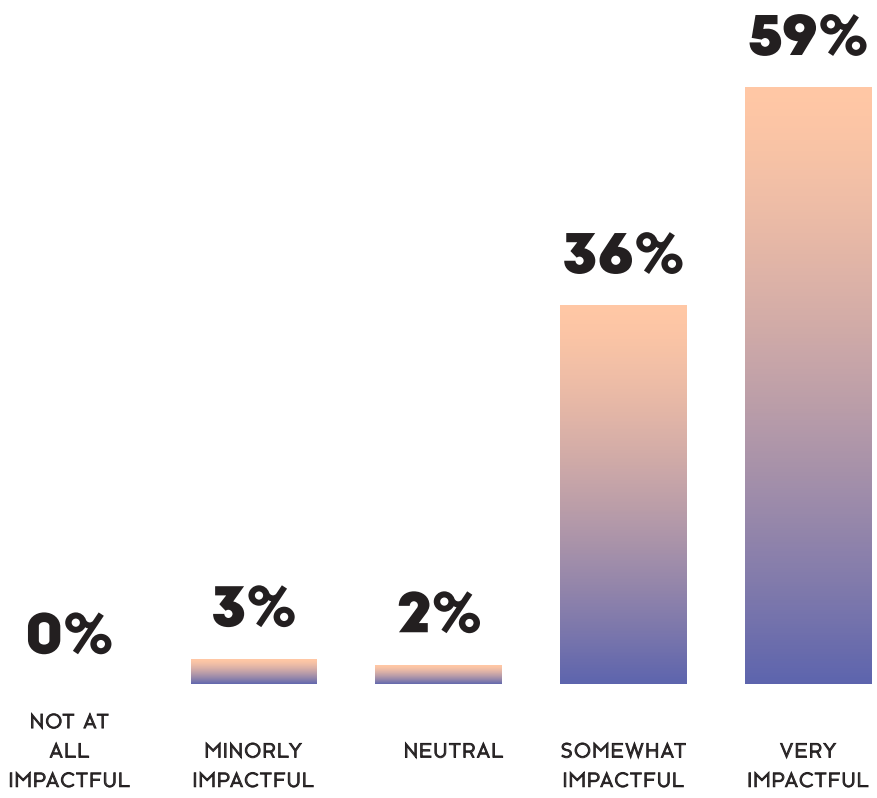
Question 5:

# When considering the degree of the metaverse's impact on society towards 2030, your overall attitude is

## Very impactful

***Panel consensus pick***

***(Consensus strength 85%)***



*"Fake news, post-truth, conspiracy theories made this siege possible. With the metaverse we are moving from post-truth into post-reality."*

**ARTIST/WRITER/ THINKER, THE NETHERLANDS, 51 – 60, MALE**

*"Everyone seems to suffer from "metaverse FOMO" right now. To a certain extent, it's like the mid-'90s all over again. During the internet boom, companies that added a '.com' suffix to their names (even though they had nothing to do with the Internet) experienced abnormal returns in terms of stock value. That's precisely what is happening with any brand with the words crypto, blockchain, metaverse, or Web3 attached to it."*

**BUSINESS/CORPORATE, ITALY, 41 – 50, MALE**

*"I hope that governments will establish roles and maybe virtual police within the next 10 years. I see many things moving especially in Crypto with the MiCA, and I was happy to see INTERPOL joining the space. But we need more than that. We must deliver to the masses a safe and inclusive space."*

**BUSINESS/CORPORATE, SWITZERLAND, 31 – 40, MALE**

*"Being isolated from reality and in a Virtual-Parallel that not only looks different from what we're used to, but also functions different, is a massive risk factor on individuals' mental health."*

**ENTREPRENEUR/ START-UP, LEBANON, UNDER 30, MALE**

*"The metaverse will massively impact our society. But this will only happen when we can seamlessly move between the metaverse and can seamlessly undertake daily activity. By this, I mean moving between physical and virtual will no interference, not dependence on good internet and good hardware. It will be a part of the fabric of society. When the internet becomes a utility - the same as water - the metaverse has an opportunity to be apart of the fabric of our society and when we secure this position we have an opportunity to address the inequalities that exist."*

**ENTREPRENEUR/START-UP, UK, 51 - 60, FEMALE**

Most panellists think the future impact of the metaverse will be significant by 2030. No less than 59% think it will be highly impactful, with another 36% think it will have some impact. In contrast, only 3% think the metaverse will only have minor impact, with none thinking it will have no impact at all by 2030, with 2% being neutral on the question.

While some panellists believe that the metaverse will be highly impactful on society by 2030, impacting everything from healthcare and education to shopping and entertainment, others think that we are unlikely to see a massive change of way of personal and work life already in 2030; rather, the metaverse will only start picking up exponential velocity around 2035-2040 when the generation growing up with first metaverse iterations reaches productive age.

The metaverse will massively impact our society, but this will only happen when we can seamlessly move between the physical and the virtual realms with no interference. Everything will transform into the metaverse. Travel, shopping, conferences, parties, medical examination, sports and many other daily activities will be in digital worlds and not in our physical reality. We'll be able to have realistic interactions with anyone on the globe. It will be easier for people to get services from government agencies (licenses, documents), medicine will become more accessible, new professions will arise, and it will be easier to get money.

VR will mean we can play with the laws of physics in our virtual worlds, freeing us from earthly constraints. We will be able to interact with objects in way we never have before, representing huge leaps for training, prototyping, and planning. The creator economy will unleash a new wave of communication, increased engagement, and new content.

Whether the outcome on society of the metaverse is positive or negative, it is undeniable that introducing new technological tools and ways of communication to large portions of the population is transformative to society – as is the degree that these tools and communication methods are available to different parts of society. When such tools are introduced, economic gaps between different cultural and geographic groups of humans can widen or narrow, but they very rarely stay the same. The state may try to control people and award them a social rating and, depending on the rating, give access to different levels in the metaverse.

Those that do have access are at greater risk of negative social impacts resulting from their interactions with technology - misinformation, bullying and hate speech, dopamine-reward-cycle addictions and other psychological and even physical disorders, disassociation with the natural environment, and the consequences thereof. However, rejection of technology due to concerns about the risks of the possible negative impacts is not the answer. The decisions we take now at this stage of building of the metaverse will determine the outcome on society, and we must guide these decisions by taking an optimistic and utopian mindset.

Question 6:

# What are the most important drivers for the development of the metaverse towards 2030

1. **Advancement & maturation of new tech expanding technical possibilities of the metaverse**

2. **Accessibility & affordability of new tech expanding access to the metaverse**

3. **Younger, more tech-savvy generations leading the way**

4. **Novel business opportunities (e.g., new ways for brands to build relations with users, to generate revenue)**

5. **Momentum to resolve trust issues (increased focus from regulators and industry players to protect of users and brands, e.g., IP rights and ownership)**

*"We have a young generation that is used to live their life in apps and on the internet growing up to adults and will demand new innovative ways to interact, evolved from the ones they already master."*

**BUSINESS/CORPORATE, SWEDEN, 41 – 50, MALE**

*"In my modest opinion, the metaverse is evolutionary, not revolutionary. It will unlikely replace the internet tout-court, but it will in the long term."*

**BUSINESS/CORPORATE, ITALY, 41 – 50, MALE**

*"The largest technology companies in the world see the metaverse as a battleground for products and services. This makes the metaverse a self-fulfilling prophesy over the next ten years. The current hype will likely settle down for a while, but competition among corporations will keep the investment aggressive."*

**ARTIST/WRITER/ THINKER, USA, 51 – 60, MALE**

*"MetaFi economy – the complex financial interplay between fungible and non-fungible tokens and their derivatives (Outlier Ventures)."*

**ARTIST/WRITER/ THINKER, AUSTRALIA, UNDER 30, FEMALE**

*"Ubiquitous Computing is driven by economics, where products utilising the most scaled technology will be cheapest to design, develop and produce. As mobiles and connected devices are the most scaled, all electronic devices will be connected and smart. Virtual Worlds are driven by the celebration and exploration of individual identity. Mixed Reality is driven by the complexities and demand of the other two. If smart physical environments with digital abilities and behaviours exist, then users need to be able immerse themselves in this physical-digital hybrid world in a tangible and very relatable way."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

Most panellists point to the importance of emerging tech: advances in immersive technologies such as AR/VR/XR headset hardware; improved body/face-capture technology; increasingly powerful and accessible computing power, enabling more complex and expansive virtual worlds to be created and experienced; improved network connectivity. The industry and investment driver for developing such technology is the expectation of long-term profits.

Many point to the range of parties interested in using the metaverse for things beyond simple social interaction: Urban planners, video game industry; e-commerce business; digital twins / smart city / smart workspace service providers; hybrid work demanding new ways to interact and collaborate; artists and other sellers that will provide content; educational institutions; institutions that educate or lobby for a certain cause.

Also brought up is the range of consumer demands for what they expect of the metaverse – especially. Gens Z and Alpha who are already being raised on immersive platforms: accessibility and affordability; openness, decentralisation, and interoperability as standards; an evolution of social and digital life allowing for more engaging experiences; improved design and user-friendliness to make the metaverse less nerdy; greater diversity in gender and culture.

Artificial intelligence is thought to play an important role: AI enables the development of fundamental backend elements, such as interoperability, data security, and financial transactions. Generative AI will create and breathe life into content in real time. AI automation could bring about the equivalent of an industrial revolution, this time in digital space. However, not all content can be created by AI; we also need an interdisciplinary approach to application development – bringing together artists, engineers, academics, etc. to truly co-create on metaverse platforms for content creation.

Access should be ubiquitous: deployment of internet and 5G in all living spaces and the open environment, including in developing countries, and broad and affordable access to technologies and products that helps make the metaverse possible, enabling global connectivity and making physical location play less of a role in work and social life.

An important requirement is the growth of internet regulation to set up rules that we can trust and that companies can be guided by to prevent a dystopian metaverse, making users feel safe and protected. This includes securing a high degree of privacy and accountability as well as secure and verified knowledge transfer to protect against scams and fake news.

Other drivers mentioned are sustainability, dissatisfaction with the status-quo of power held by the governments and corporations of the world, and the integration of financial transactions that are simpler than using crypto.

**"We have a young generation that is used to live their life in apps and on the internet growing up to adults and will demand new innovative ways to interact, evolved from the ones they already master."**

**BUSINESS/CORPORATE, SWEDEN, 41 – 50, MALE**

Question 7:

# What are the most important blockers for the development of the metaverse towards 2030

1. **Poorly designed user experiences leaving users disappointed**

2. **Lack of interoperability between technologies**

3. **Legal and regulatory barriers (e.g. GDPR, privacy concerns)**

4. **Trust and personal safety concerns in the metaverse (e.g. surveillance, lack of content moderation, harassment)**

5. **Concerns about the potential negative consequences of the metaverse (e.g., mental health, alienation, magnifying echo chambers)**

*"Unclear value proposition – meaning there is no clear definition of metaverse itself, or roles of participants in a business metaverse context."*

**ENTREPRENEUR/ START-UP, SLOVAKIA, UNDER 30, MALE**

*"We need a new tech-agnostic mindset if we don't want to be kept hostage of a dystopian, advertising-fuelled XR nightmare. Most metaverses provide immersive and fun experiences, but they also prevent users from escaping. They're 3D gilded cages, intentionally built to lock users in."*

**BUSINESS/CORPORATE, ITALY, 41-50, MALE**

*"Religions will fight the rise of metaverse, because the metaverse will reveal and finally prove that all religions are myths and that there are no gods other than us existing."*

**ENTREPRENEUR/ START-UP, GERMANY, 41 – 50, MALE**

*"Current metaverse companies like Meta are pushing cartoonish worlds with creepy avatars because that is what they can deploy right now, but that has turned off the public. Companies like The Sandbox and Decentraland have linked their metaverse ambitions to NFT speculation, which also has greatly turned off the public. The industry will suffer if additional companies botch their rollouts or link the metaverse to Web3 technologies that are not inherently related to the concept or benefits of the metaverse."*

**ARTIST/WRITER/ THINKER, USA, 51 – 60, MALE**

*"Since the metaverse is only loosely defined, groups are utilising the term and its popularity to drive their sometimes-detrimental narratives; for example, the attachment of NFTs, cryptocurrencies and blockchain to the metaverse with the goal to get more money into the crypto token ecosystem, while not providing any benefit to the metaverse discussion or development."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

**"We need a new tech-agnostic mindset if we don't want to be kept hostage of a dystopian, advertising-fuelled XR nightmare. Most metaverses provide immersive and fun experiences, but they also prevent users from escaping. They're 3D gilded cages, intentionally built to lock users in."**

**BUSINESS/CORPORATE, ITALY, 41-50, MALE**

Many panellists see competition blockage as an important blocker. Major tech companies want to develop each their own version of the metaverse that is incompatible with others – dividing instead of uniting, with too many proprietary platforms splitting audiences and leading to subscription fatigue. Power concentration in tech may prevent openness and interoperability, and for the metaverse to be successful, we need an agreed-upon set of standards and protocols used by all developers.

It matters what the consumers think: people may get tech fatigue and develop a greater desire for real life and real contact or be sceptical of using VR/AR headsets for extended periods. The value proposition may not be great enough to justify the cost and effort. Consumers and authorities may fear addiction issues. The benefits of the metaverse may be overshadowed by fear of a dystopic future where we all live in a separate virtual world. If platforms adopt advertising business models, this could greatly turn off consumers and create similar problems that destroyed trust in the social media space. Gatekeeping and machismo of early evangelists may turn new users off.

Many technical challenges in hardware and software need to be overcome for the metaverse to reach its full potential. Issues such as latency and scalability will need to be addressed. Consumer-scale Mixed Reality requires fundamentally new types of lenses and more efficient batteries – which don't even exist yet as proof of concepts or prototypes. Insufficient high-bandwidth, low-latency services to support the metaverse, especially in developing countries, may prevent global adoption. There may also be a lack of 'killer apps' that can attract users – it is not enough to attract gamers. If the metaverse fails to live up to the hype, interest will die.

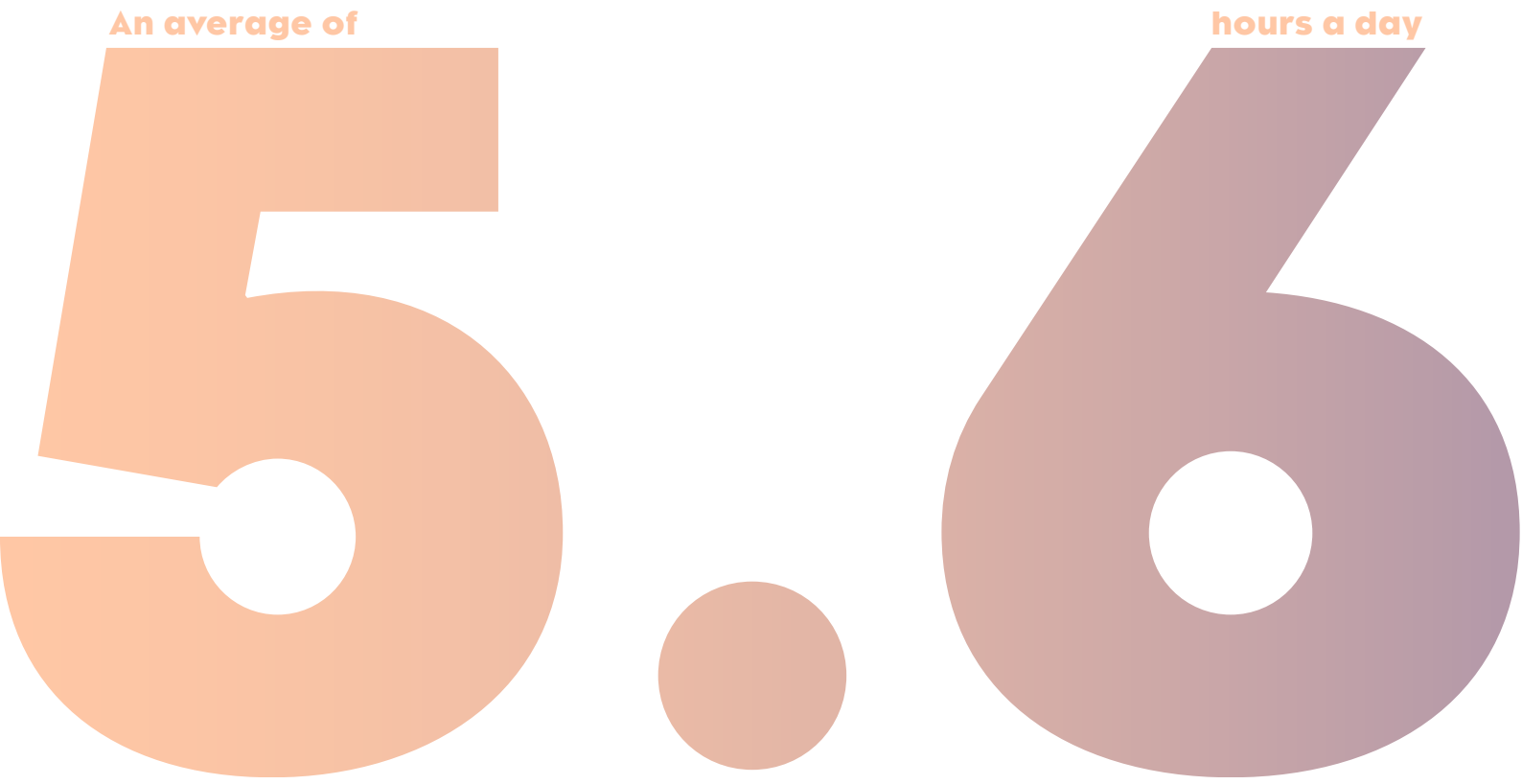
Economy issues: the cost of using the metaverse (devices and access) may be too high to make it mainstream. Developing and maintaining the metaverse will require significant financial resources, which could be a barrier to entry for smaller companies and less well-of individuals. A recession, a crypto crash or supply-chain issues may reduce investments and extend the timeline beyond consumer expectations. Lack of a fair creator economy may keep skilled content creators away.

The degree of regulation and control matters. Corporate or political regulation that seeks to control the metaverse, restrict crypto/blockchain or claim/control ownership of content may limit functionality, or may vary so much between regions that global interoperability becomes impossible. Banks will try to hinder the development of decentralised finance in the metaverse. Conversely, too little regulation may scare users away because of privacy, trust and security concerns and too many trolls and scams. Consumers that fear or experience bullying, invasions of privacy or theft or illicit use of personal content may stay away.

Question 8:

# In 2030, the average person will spend this number of hours a day in the metaverse

Panellists believe that people will spend between 1 and 17 hours a day in the metaverse, with an average between panellists of 5.6 hours. Only 10% of panellists believe that the average person will spend more than 10 hours a day in the metaverse, with 79% of the answers falling in the range of 2 to 8 hours daily. The median answer is 5 hours daily.



Question 9:

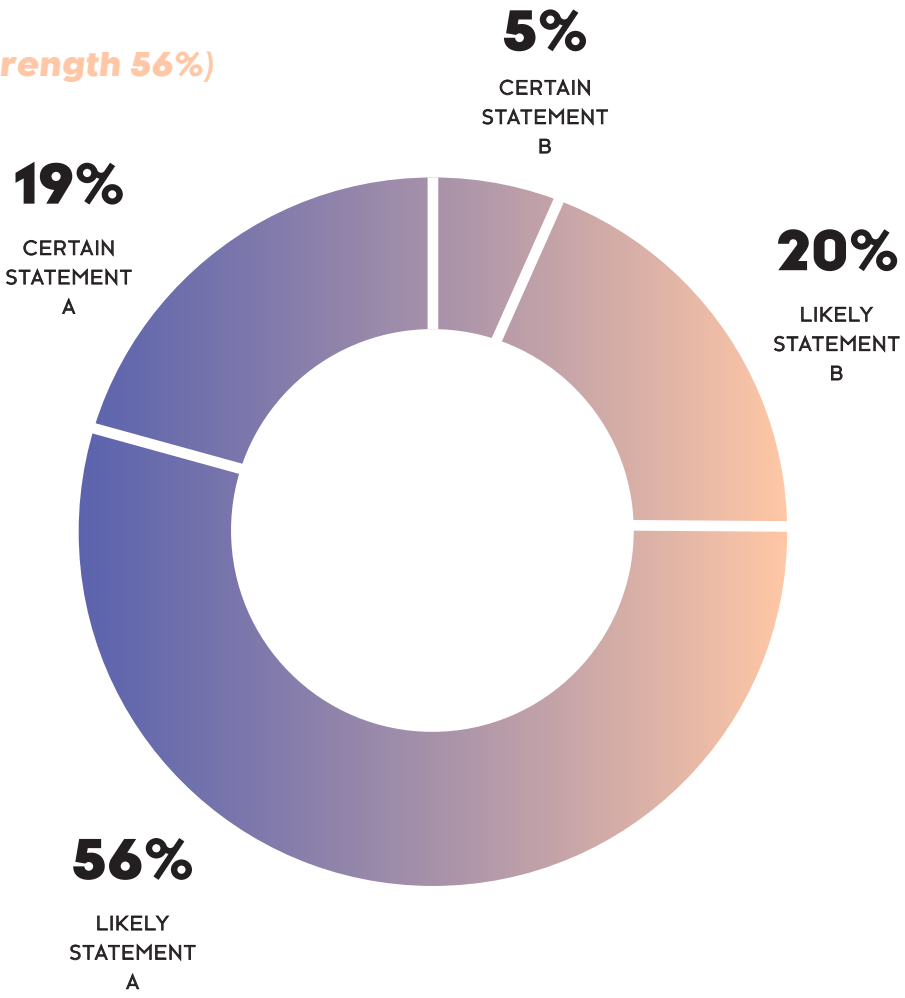
# Availability to the general public in 2030

- **STATEMENT A:** By 2030, the metaverse WILL be widely available to the general public, fully immersive, and considered useful enough to be integrated into daily life.
- **STATEMENT B:** By 2030, the metaverse WILL NOT be widely available to the general public, fully immersive, and considered useful enough to be integrated into daily life.

## No consensus

***Panel consensus pick***

***(Consensus strength 56%)***



*"Until we overcome our binary, analogue mental scheme, we'll never grasp the essence of the metaverse. If you have kids or nephews, you comprehend that, for them, playing in Roblox with an avatar 1,000 km away one day and hide-and-seek in the physical world the day after, is pretty much the same experience. At a closer look, reality is simply a form of consensus among individuals. But it'll take a few generations to get there."*

**BUSINESS/CORPORATE, ITALY, 41 – 50, MALE**

*"If we fail to deliver till 2030, we will have some other way bigger problems!"*

**ENTREPRENEUR/ START-UP, GERMANY, 41 – 50, MALE**

*"Already today we integrate technologies in almost every part of our daily life. If the experience and the usability improve through more immersion and the metaverse also provides better possibilities of digital interaction between individuals, I see it likely that we develop the according platforms and integrate it in our lives."*

**BUSINESS/CORPORATE, GERMANY, UNDER 30, MALE**

*"I do not believe it will be widely used in 2030 for healthcare, schooling, policing, government etc. – these slow and lumpy organisations take far longer to engage with innovation."*

**ACADEMIA, UK, 31 – 40, FEMALE**

*"Arguably, 'fully immersive' would also need to include haptic, olfactory and maybe even thermo-sensory immersion, which we don't have a clue how to achieve. That said, full immersion is NOT a requirement for the metaverse."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

**"Already today we integrate technologies in almost every part of our daily life. If the experience and the usability improve through more immersion and the metaverse also provides better possibilities of digital interaction between individuals, I see it likely that we develop the according platforms and integrate it in our lives."**

**BUSINESS/CORPORATE, GERMANY, UNDER 30, MALE**

Three quarters of panellists found Statement A most likely, with 19% being certain of it and 56% finding it likely. Conversely, only 5% found Statement B certain, while 20% found it likely.

Comments in favour of Statement A include that with the continued advancement of technology and the development of the metaverse, it will become widely available by 2030 – fully immersive and useful enough to be integrated – or if not fully realised, then well on the way. During and after the pandemic, people have become more used to carry out their daily tasks on the internet: With the metaverse being much more convenient than the platforms we have learned to use, and bringing them together in one place, the possibilities are truly limitless.

Many, however, are concerned that it could take longer to be mass adopted. It may take another ten years before we have advanced to the point where the metaverse has achieved the qualities required to meet its current definition. Non-Western nations may not be so quick to adopt this technology for everyday use, and its impact may be limited to select industries. As the metaverse is perceived as the natural evolution of the internet and spatial web, it is imperative that the wealth gap is closed so all nations around the world have fair access to participate, work, and earn in the metaverse. Just like social media was adopted primarily by younger generations first, with their parents slowly following in the years after, not everyone will use the metaverse by 2030, even if they can.

Comments in favour of Statement B argue that the metaverse now contains too much hype. We still lack the infrastructure to make it a seamless, enjoyable experience, and the technologies (hardware and software) needed to create the metaverse are not mature enough. It requires a fully immersive headset attractive to the public which does not exist yet, not even in prototype form. There will be need for confirmed use cases, easy user interface, low costs and Wi-Fi/cellular access to support mass adoption and daily interaction in the metaverse, which isn't likely by 2030 – certainly not on a global bases, but also not across the developed world.

Question 10:

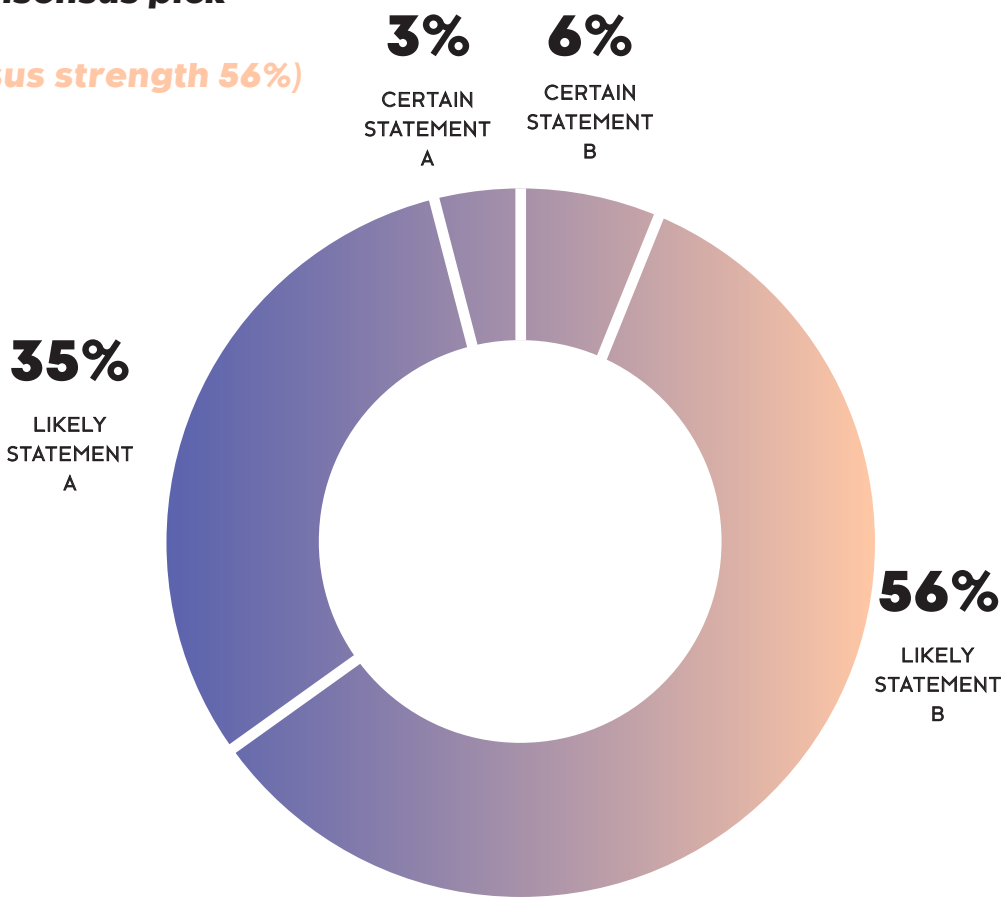
# Open and decentralised vs closed and proprietary metaverse

- **STATEMENT A:** By 2030, the metaverse will predominantly be created around open, decentralised, and democratised models.
- **STATEMENT B:** By 2030, the metaverse will predominantly be created as centralised and proprietary, with one or a few commercial players being dominant.

## No consensus

***Panel consensus pick***

***(Consensus strength 56%)***



*"I want to write that it is statement A – but I know that the mindset of the current majority of players who control regulation, and companies are centralised, not decentralised."*

**ENTREPRENEUR/ START-UP, UK, 51 – 60, FEMALE**

*"The only way the metaverse can be open and decentralised is if it's 100% produced and operated by an AI which can monetise users of that metaverse to make its business profitable."*

**ENTREPRENEUR/START-UP, SLOVAKIA, UNDER 30, MALE**

*"If we look at the scrutiny the tech giants are being placed under in today's times and the mounting pressure to break up monopolies, it is only a matter of time before we achieve a fairer system."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"As the pressures of climate change on humanity grows, humans will be looking for alternate systems to capitalism, as is our need for survival. We will see this reflected in the choices of the masses, and the dawn of the metaverse will surely encompass this sentiment, resulting in a largely decentralised structure."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"The notion that the metaverse will be based on decentralised platforms is based on zero evidence. It's a concept promoted entirely by Web3 enthusiasts who express it as an aspiration based on (a) half-baked concepts, and (b) no consideration for the reality of the corporate world. There is no chance that the metaverse will be decentralised by 2030."*

**ARTIST/WRITER/THINKER, USA, 51 – 60, MALE**

*"Interoperability and decentralisation are neither requirements for the metaverse, nor are they broadly desirable. This is like Mastodon, providing an open and decentralised approach to social media, which even now with the perfect preconditions (Twitter imploding), nobody cares about."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

This question divides the panellists, though a slight majority believe that the metaverse will be predominantly centralised and proprietary (Statement B). 56% consider this outcome likely, with 6% being certain of it. 35% consider an open metaverse (Statement A) likely, with 3% being certain of it. From the comments, a large majority favours the open version of the metaverse, but most consider the closed one more likely.

Panellists who believe in a closed metaverse argue that the commercial giants will make a strong movement to keep the metaverse environment under their control. While the preferred vision is that the metaverse will be decentralised, in practice it is already mostly centralised: "Just look at where the money comes from." Companies have nothing to gain by making their intellectual property open or decentralised, but they have a lot to lose – control over their assets, security of their systems, and their competitive advantage. Open source and collaboration can work when production and operating expenses are low to none, which for the metaverse most likely isn't the case.

Panellists who believe in an open metaverse argue that decentralised and open models tend to be more secure and resistant to manipulation than centralised and proprietary models, which makes them attractive to users who want to protect their data and privacy, as well as being inherently more democratic, and capable of supporting a wider range of user-generated content and applications. Open models also tend to be more cost-efficient and are likely to be more resilient over the long term, as they can more easily adapt to changing technologies and user needs. Some argue that the metaverse metaverse is inherently open and decentralised, because of its technology, and one company will not have the capacity to run it on its own.

Some believe in a hybrid between an open and a closed metaverse – more open than other networks today, but with big-tech players providing most infrastructure and commercial content. One perspective argues that a balance between open and closed will be required for the metaverse to exist, another that open versions will exist alongside closed, commercial ones, like "pirate radio vs major stations".

Others argue that though the metaverse may start out being mainly closed, it will move towards a more open, democratised model. History has shown us that revolution is a human reaction to overt control, despite the odds of success, time and time again. This desire for freedom and fairness is strong in humanity. The fact that web3 technologies have been conceived in the first place shows that the tech community has reacted to the current situation and already begun building the tools to take it down.

Question 11:

# The metaverse as the universal, dominant interface to online access

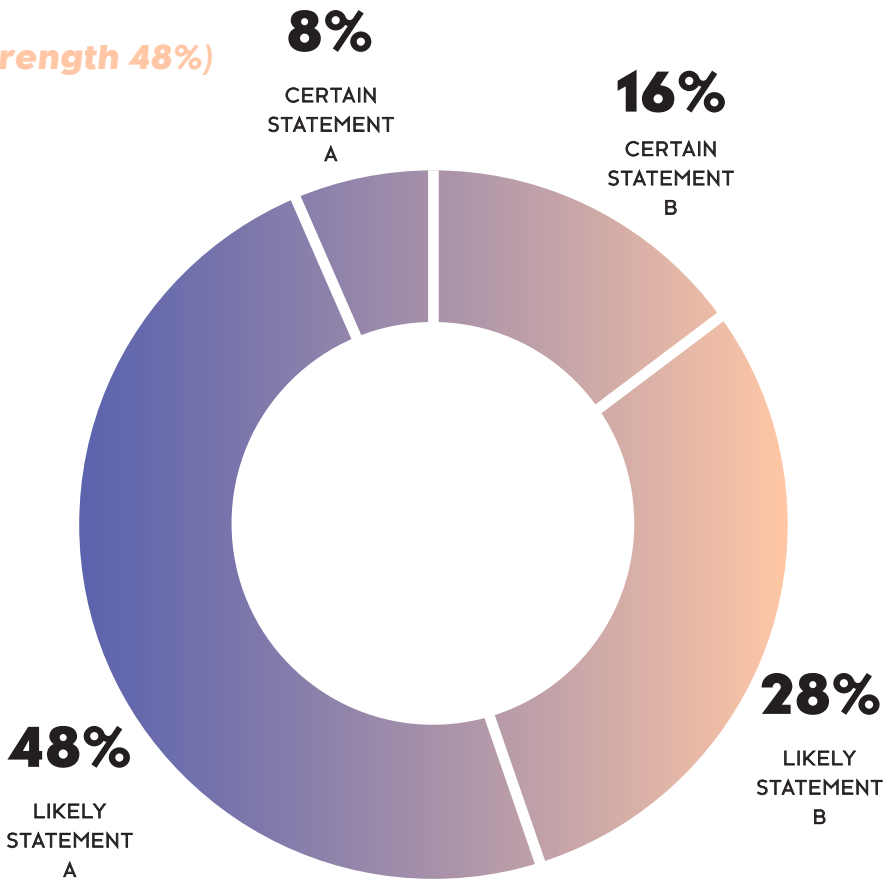
- **STATEMENT A:** By 2030, the metaverse WILL have grown to become the universal, dominant interface to online access with multiple immersive devices and haptic interfaces, increasingly replacing smartphones, screens and keyboards.

- **STATEMENT B:** By 2030, the metaverse WILL NOT have grown to become the universal, dominant interface to online access with multiple immersive devices and haptic interfaces, and will not have replaced smartphones, screens and keyboards.

# No consensus

***Panel consensus pick***

***(Consensus strength 48%)***



*"Regardless of your definition of the metaverse, I believe the metaverse adoption depends on infrastructure which simply won't be available worldwide by 2030. That's of course, unless Elon Musk makes StarLink available globally, for free, before 2030."*

**ENTREPRENEUR/START-UP, SLOVAKIA, UNDER 30, MALE**

*"100% for sure!"*

**ENTREPRENEUR/START-UP, GERMANY, 41 – 50, MALE**

*"From my perspective, by 2030 we will still have a mix between Web2 and Web3. Websites of many important companies worldwide will have an embedded Virtual Space where users can access and have an immersive experience. When affordable tools come on the market, we will probably see even small companies building up their own spaces, and at that point, we will have a dominant new interface of internet."*

**BUSINESS/CORPORATE, SWITZERLAND, 31 – 40, MALE**

*"Just as the internet and television have not replaced books, newspapers or radio, immersive devices are unlikely to replace traditional electronic means of accessing information and entertainment."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"I find this question to be difficult because it mixes the virtual metaverse and the augmented metaverse. They will be on different timelines, have different corporate players, and will replace different existing ecosystems. If this was broken out into two questions, one for VR and one for AR, I would have answered A for the augmented metaverse, and B for the virtual metaverse."*

**ARTIST/WRITER/THINKER, USA, 51 – 60, MALE**

**"Regardless of your definition of the Metaverse, I believe the Metaverse adoption depends on infrastructure which simply won't be available worldwide by 2030. That's of course, unless Elon Musk makes StarLink available globally, for free, before 2030."**

**ENTREPRENEUR/START-UP, SLOVAKIA, UNDER 30, MALE**

The panellists are roughly evenly split on this question. 48% think it likely that the metaverse will be the dominant online interface by 2030 (Statement A), while 8% consider it a certainty. Conversely, 29% think it likely that this will not be the case (Statement B), while 16% think it will certainly not be the case.

The panellists who think that the metaverse will be the dominant interface by 2030 believe that the technology – the devices and the underlying platforms – will be there, but not all believe that this means universal adoption of the technology. Some activities will be transferred entirely inside the metaverse, while others will take longer to translate from the current web. Others think that AR and haptics will be the primary means of accessing the internet, but don't believe that the metaverse will be 'a place to go' by 2030 – unless there is sufficient content to drive this.

Sceptical panellists think that it will take more than eight years to have a full conversion of internet interfaces with multiple immersive devices and haptic interfaces. The current cost of equipment is inaccessible, making a quick shift impossible – hinting at a time frame closer to 20 years. Some are unsure whether the metaverse with haptic interfaces will completely replace the internet at all. Smartphones, screens and keyboards are very unlikely to be replaced due to their utility and versatility. Fully immersive solutions, while offering a superior experience and presence in certain use cases, are a strictly worse experience if the user requires outside awareness. There are also health factors associated with using immersive devices all day.

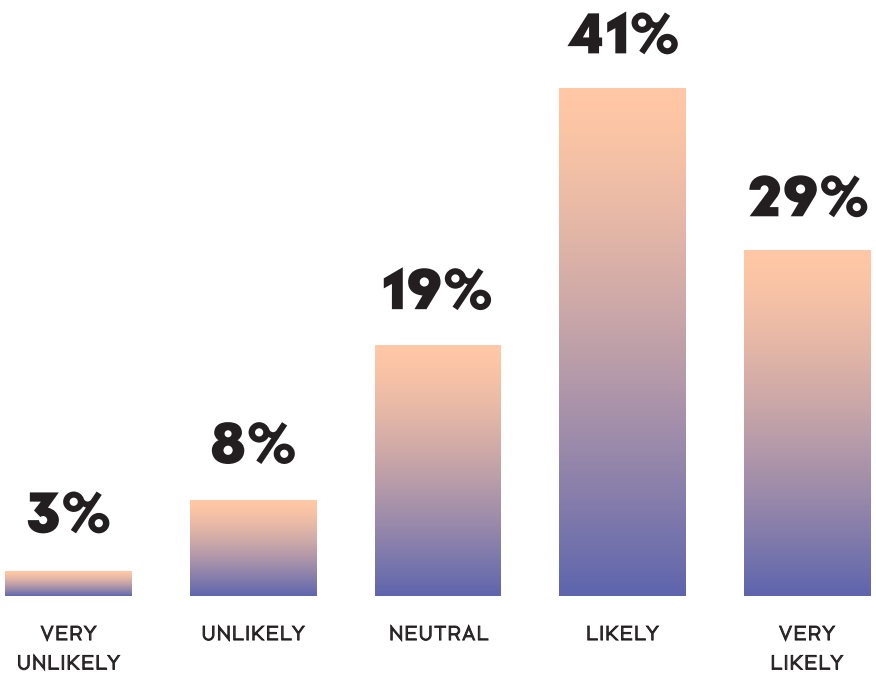
Question 12:

# By 2030, our virtual and physical worlds have merged in a way that we freely navigate between them in our daily lives

## Likely

***Panel consensus pick***

***(Consensus strength 73%)***



*"Even if we take the most bleeding edge generation of immersive devices like Varjo HMDs, they are still only supporting auditory and visual interfacing. In my opinion, complete merge of digital and physical would require full immersion: interfacing all human senses including touch, smell, and taste, and then even more – simulating rotation and movement to bridge over discrepancy between middle ear and other senses or simulating temperature changes."*

**ENTREPRENEUR/ START-UP, SLOVAKIA, UNDER 30, MALE**

*"It is not only the utility provided by this merging of physical and digital, but also the enriching entertainment experiences and opportunities for expression and creativity enabled by technology that will be the drivers for this shift."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"I don't think real humans will want to constantly navigate in a digital world. I think we will have to distinguish clearly between the two worlds and be very conscious every time we enter the digital world and leave it again in order not to let them meld together."*

**ARTIST/WRITER/ THINKER, DENMARK, 51 – 60, FEMALE**

*"A more interesting question might be if there can be another level of quality between that merger, and my answer would be 'likely yes' – the moment when virtuality becomes inseparable from reality for society. Arguably this might already be the case."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

**"The internet of things is becoming more prevalent and could potentially provide a bridge between the two worlds."**

**ARTIST/WRITER/THINKER, DENMARK, 31 – 40, MALE**

Most panellists agree with this statement. 41% consider it likely and 29% very likely. Only 8% find it unlikely and 3% very unlikely, with the remaining 19% being neutral.

Even today, most people can digitally access most of their daily life functions, whether for school, leisure or work. There is no current sense of online/offline. We merged these realms years ago; our devices of access are just not embodied yet. We already have a good understanding of how to merge physical and virtual experiences, such as augmented reality and virtual reality, and many of these technologies are becoming more accessible and affordable. The market will be more comfortable and confident with immersive digital experiences, allowing these interactions to become part of the daily life of at least a portion of the population.

Self-sovereign digital identity and digital avatar twins infused with AI/ML transactional permissions are already in development. Tech such as AR, VR and XR will all have developed enough that the blend between physical and digital becomes less concrete and more integrated into our everyday lives. The commercialisation, democratisation and accessibility of augmented reality glasses will catalyse the seamless and symbiotic integration between both the digital and physical realms.

As with the previous question, sceptics believe it will take several more years for this merge between digital and physical to be fully achieved. We will still face supply chain issues for hardware, a recession that will limit investment, and a population to whom the leap might be too long. We'll be on the way, but not yet quite there. There will be attempts, but not seamless enough for people to really go for it. By 2030, some metaverse applications will allow easy transition between virtual and real, but others will still experience issues. Not everyone goes at the same speed.

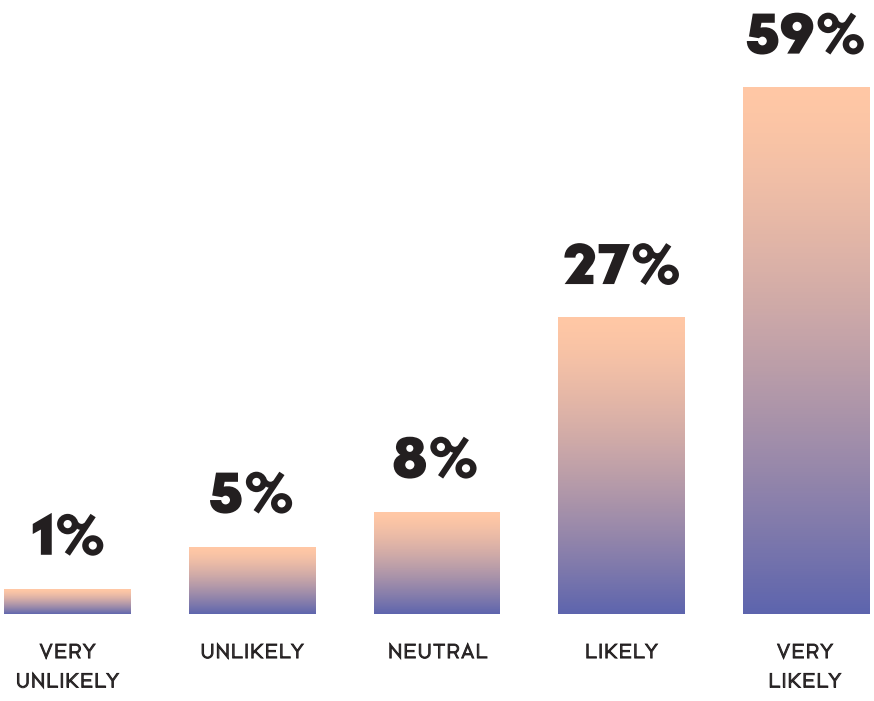
Question 13:

# In 2030, it will be the norm that individuals are using the metaverse to express and represent themselves in new ways that are unimaginable today

## Likely

***Panel consensus pick***

***(Consensus strength 79%)***



*"Communicating as an avatar, in virtual worlds, not bound by physical locations, this is going to be the norm"*

**BUSINESS/CORPORATE, THE NETHERLANDS, 51 - 60, MALE**

*"Creators have an amazing opportunity to represent themselves freely without even doxing themselves. This amazing thing metaverse empowers people to change their names, personalities, professions and ways of how they earn money!"*

**ARTIST/WRITER/ THINKER, LITHUANIA, 31 – 40, FEMALE**

*"In the metaverse, everybody has the tools, by using generative AI, to create their own reality. It means the democratisation of creativity. By entering the correct words in the command prompt, anyone can be a painter, a cartoonist, a poet, a writer, a musician, a singer, an actor, a cameraman, a sound engineer or a director. Words are the new paintbrush."*

**ARTIST/WRITER/ THINKER, THE NETHERLANDS, 51 – 60, MALE**

*"Decentralised wallets will be the new frontier of social media. They will represent the image of ourselves we want to provide the world."*

**BUSINESS/CORPORATE, ITALY, 41 – 50, MALE**

*"The average user will be surprised by the depth and difficulty of questions that await them still, for example around identity fluidity, transferred biases, and identity collapse."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

*"Metaverse won't be seamless enough for people to really go for it. There will be groups exploring and using it, but the vast majority will still prefer what they know today."*

**OTHER, DENMARK, 31 - 40,WOMAN**

**"Generation Z and Alpha believe that how you present yourself online is more important than offline. They also feel more comfortable in expressing themselves online than offline. We have to look at these two generations to fully understand how the Metaverse will evolve. Online identity, (CGI) influencers, avatars, virtual YouTubers, virtual humans show the path forward."**

**ARTIST/WRITER/THINKER, THE NETHERLANDS, 51 - 60, MALE**

The panellists are very much in agreement with this statement. No less than 59% consider it very likely, with another 27% thinking it likely. 5% consider it unlikely and 2% very unlikely, while 8% are neutral.

Panellists agree with the general statement, but most disagree that the new ways of expression are "unimaginable". Given current trends in technology, it is likely that individuals will increasingly use virtual and augmented reality to express and represent themselves in the future. As technology continues to advance, it is likely that new creative ways will emerge. We might see 3D-printed and robotic fashion developed in collaboration with AI to represent a coherent identity across the virtual and material, as well as many other related examples with brain interfaces, wearables, and so forth. Communicating as an avatar, in virtual worlds not bound by physical locations, is going to be the norm.

If we look at the ways the internet is being used today by individuals to represent and express themselves, it is logical that given more tools and platforms, individuals will take advantage of them for self-expression. According to a recent study published by Roblox, 40% of respondents claimed that self-expression (via clothing and accessories) in the digital world was already more important than expressing themselves in the physical world. Content creators, artists, and influencers will have a realm in which they can benefit from their talents, thoughts, and creations in a decentralised manner. This is obvious with the emergence of NFTs.

Sceptics argue that the metaverse won't be seamless enough in 2030 for this to materialise. There will be groups exploring and using it, but the vast majority will still prefer what they know today. While new and valuable use cases will arise, they will not be in commonplace usage by 2030.

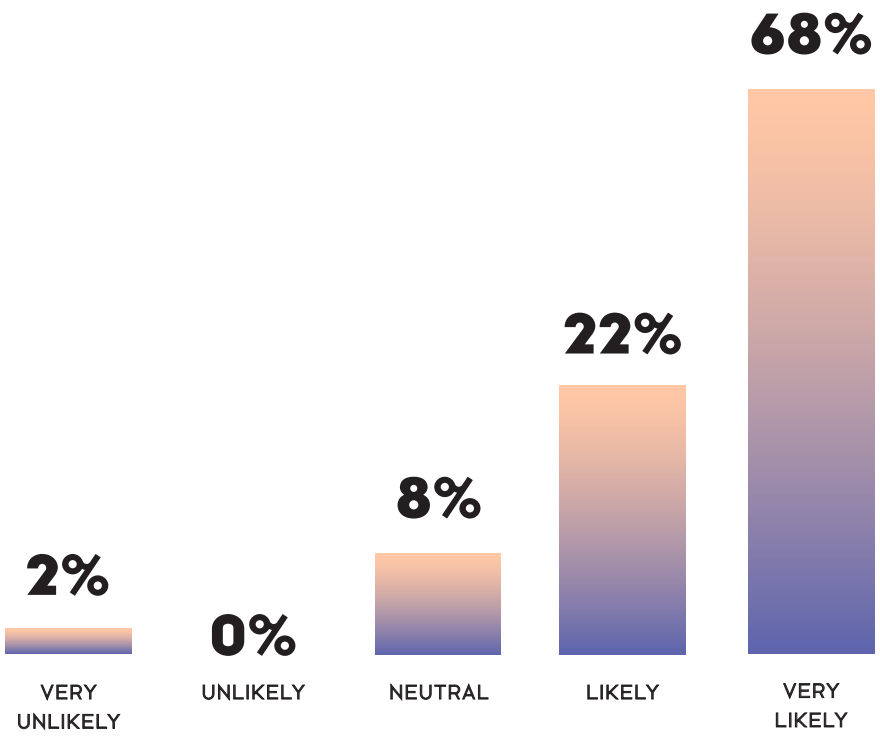
Question 14:

# By 2030, it will be as essential for commercial brands to have a presence in the metaverse as it is to have a webpage today

## Very likely

***Panel consensus pick***

***(Consensus strength 83%)***



*"Brands and businesses are key to a wider adoption, but we should be careful of these gatekeepers."*

**ARTIST/WRITER/ THINKER, NIGERIA, UNDER 30, MALE**

*"Not yet. From my perspective, by 2030 many brands will be present in the space, but Web 2.0 will still be important."*

**BUSINESS/CORPORATE, SWITZERLAND, 31 – 40, MALE**

*"It's likely but I would love if it just didn't happen. Would be nice if commercial brands could also adapt and evolve to be something other in the future of the metaverse than the rather horrible way they now use our data and try to sell us things we don't need and don't want."*

**BUSINESS/CORPORATE, DENMARK, 31 – 40, FEMALE**

*"Brands that are early, and match presence, strategy and expectations in a way that align with the early adopters, will have a competitive advantage. But it's a competitive advantage that comes with risk and cost. Risk because there are no best practices yet. Cost because most things have to be custom built, things change quickly, there are no tools to abstract away complexity (because there are no best practices to base tools on)."*

**BUSINESS/CORPORATE, NORWAY, 31 – 0, MALE**

*"Companies must rethink how they will govern their IP in all these alternative realities. Will they forbid internet users to play with their IP, or will they embrace the stories/ worlds internet users create with their IP?."*

**ARTIST/WRITER/ THINKER, THE NETHER-LANDS, 51 - 60, MALE**

*"Brands that are early, and match presence, strategy and expectations in a way that align with the early adopters, will have a competitive advantage. But it's a competitive advantage that comes with risk and cost. Risk because there are no best practices yet. Cost because most things have to be custom built, things change quickly, there are no tools to abstract away complexity (because there are no best practices to base tools on)"*

**BUSINESS/CORPORATE, NORWAY, 31 – 40, MALE**

**"The reason why brands entered the Internet was not to have a "presence on the web", but to use the new digital capabilities to improve or create a certain line of business. Likewise, all brands and organisations will look towards the Metaverse and use Metaverse technologies to improve their business."**

**BUSINESS/CORPORATE, GERMANY, 41-50, MALE**

Most panellists agree with this. 68% find this very likely, and another 23% consider it likely. 8% are neutral, while the remaining 2% find it very unlikely.

Panellists believe that e-commerce as we know it today will change completely with a more immersive experience. It will be like in the 1990s, when it was discussed if companies should have a website. Brands that don't offer immersive experiences will lose out significantly. It is already essential for them to start to think about it, if not already act upon it. The deciding factor for how much they will pivot and invest will be based on what the shape of the metaverse is by 2030. Most companies will have representative offices in the metaverse or separate digital offices. Government agencies may even conduct the reception of citizens in the metaverse.

KPMG estimates that 70% of brands will have a presence in the metaverse by 2027; if so, it is very likely that we will see a complete shift in 2030. In a study conducted by McKinsey, it was expected that more than 15% of corporate revenue in the next five years would come from the metaverse.

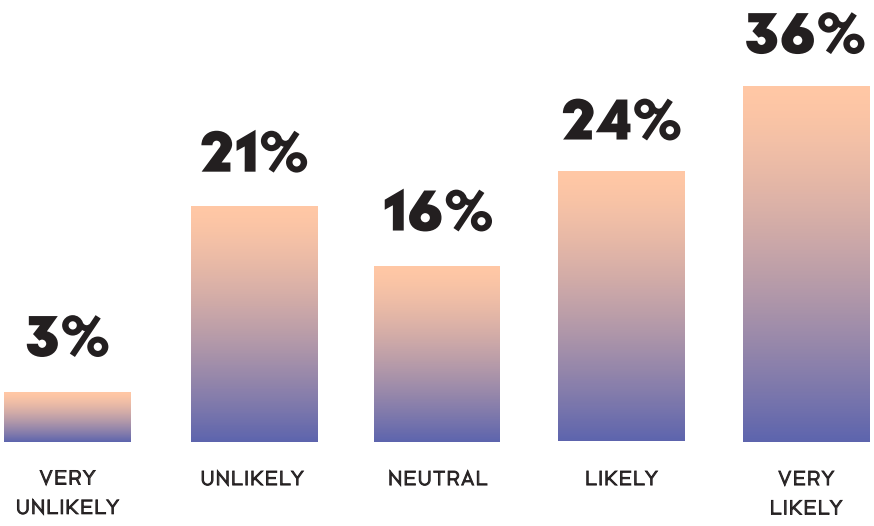
Question 15:

# By 2030, virtual assets in the metaverse will be considered just as valuable (or even more valuable) for most individuals as physical alternatives

## No consensus

***Panel consensus pick***

*(Consensus strength 59%)*



*"The main argument against digital assets being of value is that they currently have little to zero utility outside the platforms where they reside. As we see interoperability between platforms become a reality, the value of digital assets will go up."*

**OTHER, INDIA, 31-40, FEMALE**

*"Some people already believe that "Fake is worth more than real". Think about the Gucci bag that has been sold to an avatar in the world of Roblox. The virtual item is worth more than the physical counterpart. And think about Gen Z and Alpha they are used to pay for swords, clothes and magical items."*

**ARTIST/WRITER/ THINKER, THE NETHERLANDS, 51 – 60, MALE**

*"I'm afraid so. I don't find this appealing."*

**BUSINESS/CORPORATE, UK, 51 – 60, FEMALE**

*"Utility as opposed to cosmetic value is key when considering the demand for any asset, physical or digital. The main argument against digital assets being of value is that they currently have little to zero utility outside the platforms where they reside. As we see interoperability between platforms become a reality, the value of digital assets will go up."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"There will certainly be some virtual and digital assets that are highly valuable. However, I don't anticipate it to be commonplace in 2030."*

**OTHER, USA, 41 – 50, FEMALE**

*"You cannot live in the metaverse. You cannot eat in the metaverse. You cannot drink in metaverse. It has its limits. Food / warmth / nutrition / sustenance / home - these cannot be provided digitally."*

**ACADEMIA, UK, 31 – 40, FEMALE**

*"Our lives right now exist in a joint state of real and virtual. For example, your credit or debit cards are physical representations of your wealth that lives in virtuality. Public transportation or event tickets live in smartphones only. Personal digital augmentation lives in social media or work portals. All these digital aspects are already as valuable for most individuals as physical alternatives."*

**BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE**

**"The main argument against digital assets being of value is that they currently have little to zero utility outside the platforms where they reside. As we see interoperability between platforms become a reality, the value of digital assets will go up."**

**OTHER, INDIA, 31-40, FEMALE**

Most panellists think this likely (24%) or very likely (37%), but many consider it unlikely (21%) or very unlikely (3%). 16% are neutral.

Panellists argue that for certain demographics, this is already starting to become true. Values are shifting. Many people understand that there is no difference between physical possession and virtual possession. Digital knives are sold for thousands of dollars in FPS games, people invest in virtual Nike shoes to their avatars, etc. Virtual assets can provide access to new worlds, experiences and opportunities that are not possible in the physical world, and digital assets are easily transferred and are not impacted by geopolitical events like natural disasters or war. We have seen digital assets with astronomical value attached to them.

Digital asset creators are coming up with enhanced utilities for digital assets, some of which surpass what is possible with physical goods. Tokenised membership to DAOs, providing owners with voting rights, is a new mechanism that gives joint ownership over digital platforms, with the potential to have huge influence over our daily lives.

While not everyone will care about dressing their avatar in owned, branded virtual clothing, some panellists argue, many more will care about ownership of something more valuable – their personal data. If this data sits on a tokenised asset instead of the server of a corporation, only able to be exposed at the owner's choice, we can see these types of assets as extremely valuable with no real physical equivalent.

Sceptics argue that although digital assets will increase in value, people will still need physical goods and services to perform their lives. Traditional assets where value is not mainly driven by hype or non-essential needs will still dominate. There is insufficient infrastructure to make a strong virtual market possible by 2030, and virtual assets may also be heavily regulated.

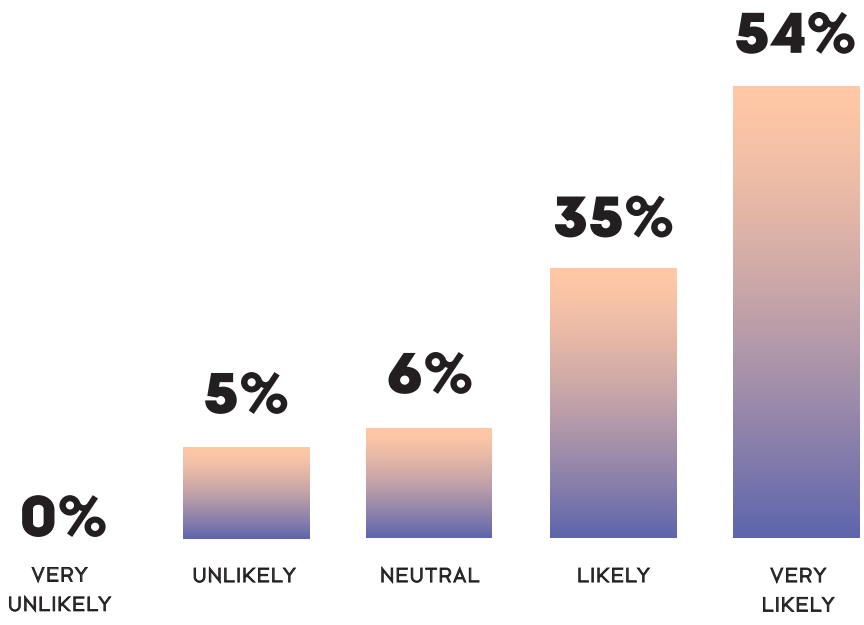
Question 16:

# In 2030, it will be the norm that higher education institutions have made an entry to the metaverse by delivering education on a virtual campus

## Likely

***Panel consensus pick***

***(Consensus strength 81%)***



*"I am already planning a course that will take place fully in virtual reality for a class that has a headset for each student."*

**ARTIST/WRITER/ THINKER, DENMARK, 31 – 40, MALE**

*"Young people are already educating themselves in the worlds of Fortnite, Roblox, Minecraft and TikTok. Why read a book if you can be taught in immersive worlds?."*

**ARTIST/WRITER/ THINKER, THE NETHER-LANDS, 51 – 60, MALE**

*"Education institutions are still mostly funded by government (unlikely to change) and anything pertaining to government tends to move slowly. I do think it will become the norm, but it will be much later, when the metaverse is a commercial norm already adopted by market leaders."*

**ENTREPRENEUR/ START-UP, SLOVAKIA, UNDER 30, MALE**

*"I can't help but think of the fiction novel Ready Player One and the protagonist's positive experience of virtual education and how much I would have preferred it to my own traditional, physical education. I am sure I am not alone in this opinion as someone that had limited access to quality education and social aspects like bullying and inequality were factors that affected the quality of the experience."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"Having been in academic for 15+ years ... I know how slow these things are. SOME institutions may try to move into digital world more and provide SOME courses in this fashion. But what is far more likely is new institutions emerging designed to do this and this alone. The METAUNIVERSITY doesn't need to adapt current practices – it can invent its own"*

**ACADEMIA, UK, 31 – 40, FEMALE**

**"Young people are already educating themselves in the worlds of Fortnite, Roblox, Minecraft and TikTok. Why read a book if you can be taught in immersive worlds?"**

**ARTIST/WRITER/THINKER, THE NETHERLANDS, 51 – 60, MALE**

The overwhelming majority believe in this statement, with 54% finding it very likely and 35% likely. 6% are neutral about the question, while 5% find the idea unlikely. None find it very unlikely.

Increasingly, education will integrate immersive experiences through travelling, visiting international exhibitions, practicing among different people from different regions. We already see examples of institutions locating their campuses in Decentraland. The potential of interaction and collaboration across geographies is immense, including the ability to create immersivity of remote training, including gamification of classes with real-time quizzes, exercises and labs. It makes the experience of remote studies more convenient. As platforms get more democratised and drive down cost of implementation, we will see more and more institutions going this route. By 2030, most educational institutions will conduct training or lectures in metaverses. It will be easier for students to study the material, as they will be able to work with it internally, rather than observe from the outside.

A huge number of studies now demonstrate the value of virtual and augmented reality as educational components that enhance learning. When these technologies become more sophisticated and achieve mainstream adoption, it stands to reason that they will benefit a large share of the population. Virtual education has the potential to democratise the experience to some degree. Today, geographical, socio-economic and accessibility factors prevent a large part of the population from having access to quality education. If the facilities of a world-class institution are available virtually, then many more people could in theory have access to those facilities, no matter where they live or if they are fully able-bodied, and potentially at a much lower cost.

Several panellists think that while virtual campuses can supplement physical campuses, they can't replace them. Physical presence at school is and will remain very important. Education will be a mixture of the physical and the virtual.

Question 17:

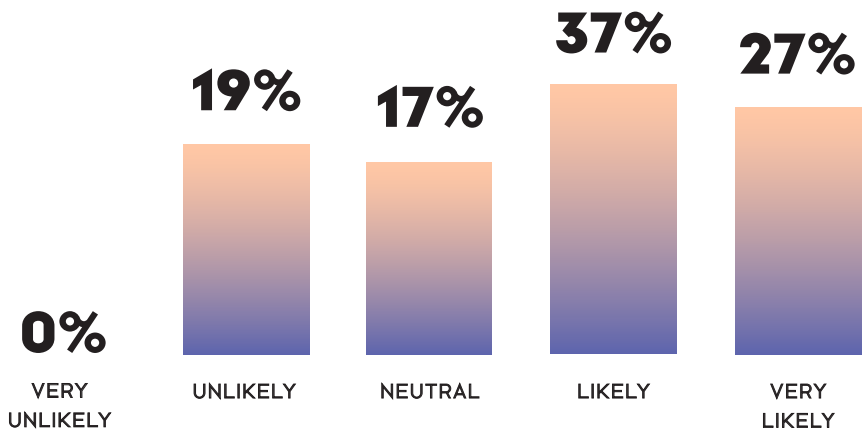
# By 2030, most of the content in the metaverse will consist of AI-generated content

*(Such as Generative AI we see today with GPT-3, ChatGPT and DALL-E 2)*

## Likely

***Panel consensus pick***

***(Consensus strength 71%)***



**"AI generated content is the only way to build the metaverse at scale. There will be human guidance and intervention but AI will be central to the process."**

ARTIST/WRITER/THINKER, USA, 51-60, MALE

Most panellists consider this likely (37%) or very likely (27%). 17% are neutral, 19% think it is unlikely, but none find it very unlikely.

Generative AI is seen as one of the drivers behind the metaverse, enabling the move from Web 2.0 to Web3. AI-generated content is the only way to build the metaverse at scale. More advanced AI is key for the technological advancement and success of the metaverse because broader uptake depends on getting a more seamless experience. There will be human guidance and intervention, but AI will be central to the process.

AI could also democratise metaverse development. Users will use AI to augment their own creations. This will enable more people to create more and express themselves freely.

Sceptics argue that we have had generative content for decades, called procedural generation. It is a great tool for some types of games and some types of challenges but doesn't work the way most people think. The fact that generative content gets better graphics or dialogue doesn't change that. Content will still be fuelled and driven by data captured from physical things, processes and objects, potentially augmented by AI. Most of the basic and generative content will be produced with AI support, but high-level quality content and physical life-based scenarios will still be produced by humans. We must rely on the creativity of individuals to influence the pattern for the whole. Art will still have a place; people will always value human art above AI art.

## Quotes:

*"AI generated content is the only way to build the metaverse at scale. There will be human guidance and intervention but AI will be central to the process."*

ARTIST/WRITER/THINKER, USA, 51-60, MALE

*"I am already using GPT-3 and MidJourney to help create content for lots of my work – even this survey. And seeing the improvements from MidJourney v3 to v4 is just wild!"*

ARTIST/WRITER/THINKER, DENMARK, 31 – 40, MALE

*"With more creators joining the space, I see the need of a good story. AI can't provide the needed social aspect to people who buy stories of other people."*

ARTIST/WRITER/THINKER, LITHUANIA, FEMALE

*"As an artist that leverages AI tools in my art, I have considered the debate on if AI will take the work of artists away. Like many others, I have concluded that AI will only enhance human creativity by allowing for fast conceptualisation and visualisation of ideas, automation of mundane tasks and other amazing creative tools. In this respect, the use of AI is likely to increase the amount of generated content. However, I have found that human intervention is cases necessary for the final output, and this affects the definition of if an artwork or piece of content is AI-generated or not."*

OTHER, INDIA, 31 – 40, FEMALE

*"What AI platforms are doing is simplifying our daily lives, but in reality, the effect of this simplification is a decrease in creativity and potentially a decrease in the need for human imagination."*

ENTREPRENEUR/START-UP, LEBANON, UNDER 30, MALE

*"As more AI generated output will become available to everybody, their value will tend towards zero."*

BUSINESS/CORPORATE, GERMANY, 41 – 50, MALE

Question 18:

# Rank your top 5 areas in which the metaverse will play a significant role towards 2030

## 1. Social interaction

## 2. Gaming

## 3. Entertainment

## 4. Education

## 5. Work

The panellists were asked to choose and rank five categories from a selection of eleven that were selected from an initial survey for this question.

The most common first-ranked answers among panellists are, in order, "social interaction", "gaming" and "entertainment". "Education" scores highest among answers ranked second and is the also the fourth most common answer overall, followed by "work", "outreach for brands and organisations" and "sports". Only a few believe among the panellists believe that the metaverse will play a significant role in the remaining four categories, "searching for new information", "travel", "financial industry" and "news".

Question 19:

# Rank your top 3 technologies you believe will be key in opening the metaverse for the masses

## 1. Augmented Reality (AR)

## 2. Artificial Intelligence (AI)

## 3. Virtual Reality (VR)

The panellists were asked to choose and rank three technologies from a selection of seven that were selected from an initial survey for this question.

Most panellists by far name "Augmented Reality (AR)" as their first rank, and this is also the most popular answer overall. In second and third rank, "Virtual Reality" is the most popular answer, and it is also the second-most popular answer overall. In third place comes "Artificial Intelligence (e.g., generative AI)". Of the remaining four technologies, "Spatial computing" is the most popular, with more than two out of three panellists having this in their top 3.

The three remaining technologies, "Holograms", "Spatial sound" and "Brain Machine Interface (BMI)" are the least popular choices, though each are named in the top two ranks of four panellists (of 63 for this question), with one to four more having them in third rank.

**Question 20:**

# What are your perspectives on what actions need to be taken in order to ensure a positive, healthy culture in and around the metaverse

Many panellists stress the importance of maintaining the physical world as the core of human essence, which allows real people to interact in a virtual world. This can be achieved by using augmented reality as opposed to its virtual counterpart, as it keeps us connected with our real environments.

Many speak of the need for a truly decentralised, interoperable metaverse, where users aren't locked into siloed walled gardens which don't enable interoperable sovereign wealth. Systems should be accessible by and equal to all members of society, regardless of race, gender, sexuality, ability, etc.

Safety is a common concern. Protections must be built into the metaverse's structure, ensuring that individuals and their private places are kept safe – as in our physical life. Regulation, policy, laws and safety bills need to be in place to allow user protection and recourse. Linking users' online presence with their real identities, even when using pseudonyms, and keeping users accountable, will limit the unhealthy interactions we see today on traditional social media. Toxic online environments already prove this: The more anonymous, the more toxic. Age restrictions need to be applied to certain environments.

We must build an accessible, inclusive, democratic and bias-free metaverse, with clear and transparent terms and conditions and an industry code of conduct and ethics, creating a strong consent culture. Moderation of and by AI may play a part. Standards need to be developed that are supported and agreed upon by developers and users. We should not just rely on big tech companies to guarantee safety in the metaverse. The EU should tell companies how to act and not leave it up to them to self-regulate. This needs to be done now. Everyone who develops metaverses should already be working with the audience, creating rules. We need all the companies to be more transparent in what they are building, with a foundation of trust being built between the platforms, government, corporates, creators, consumers, and brands.

*"Already too late. Think only about deepnudes, conspiracies, deepfakes, fake news, virtual rape, online harassment, cancel culture, free speech, privacy, surveillance capitalism, addiction etcetera. If we couldn't solve these issues in the current internet, what makes you think we can solve in the metaverse?."*

**ARTIST/WRITER/THINKER, THE NETHERLANDS, 51 – 60, MALE**

*"Find a decentralised way to govern such an open ecosystem that is excluding centralised players (FB, Google, ...) from steering the direction it is taking. A self-governed approach is the best way."*

**ENTREPRENEUR/START-UP, FRANCE, 31 – 40, MALE**

*"It's important that we are all able to recognise positive experiences when we see them in the metaverse(s). Seeing as how not all experiences are created equal, I think there should be a rating system for general users to rate positive experiences. It can be as simple as a star system."*

**BUSINESS/CORPORATE, USA, 41 – 50, FEMALE**

*"Health Care and Patient Experience was not considered as an option for this question. It will be one of the driving factors of mass adoption and will drastically change the process between diagnosis, doctors, hospitals and treatment."*

**ENTREPRENEUR/START-UP, ITALY, UNDER 30, MALE**

*"We will need to first look at the state of our current internet and what is broken in terms of biases, diversity, toxic cultures around social media platforms, privacy, accessibility, governance etc and ensure we don't repeat the same mistakes. We have a chance to start from a near-blank canvas."*

**OTHER, INDIA, 31 – 40, FEMALE**

*"The spread of misinformation is often at the root of radicalisation, along with other forms of psychological manipulation by bad actors. We can put failsafes in place to prevent these root causes of negative and dangerous behaviours, but then the issue appears of who decides what behaviours are negative and dangerous, so we must tread very carefully."*

**OTHER, INDIA, 31 – 40, FEMALE**

We need to teach and train media literacy, including metaverse literacy, from primary school onwards. People need to be educated in what the metaverse is, what it can be and how to behave there. If people consider their identity, values, purpose, and priorities, then it is a lot easier for them to use a new technology in a way that is meaningful for them and for those they interact with. We especially need to educate and guide early adopters of a mature metaverse on empathy, fact checking and inclusive mindset.

Academia can play a part. It is important to research the psychological impact of the metaverse on different demographics, to understand what can and will happen and how to counter any undesired outcomes. We should invest in research and innovation piloted on a model that bridges the gap between science, society, and policy. Policy needs to stay ahead of product, and much work needs to be done on looking at potential unintended consequences. We have decades of research around the core technologies and aspects of the metaverse: virtual worlds, ubiquitous computing, mixed reality, etc. This includes insights around technology, social dynamics, governance, accessibility and limitations. The first step is to acknowledge and use this.

**"We need to come up with ethical frameworks for how to protect user data in the Metaverse which is connected to our self-sovereign identity. This includes privacy and general ethics around XR, VR, MR and AR, fundamental neural rights, intimate biometric and physiological data. Eye tracking reveals subconscious intent and shouldn't be allowed. In terms of a digital footprint, users should have the right to privacy and right to be forgotten so they don't surrender their rights in the Metaverse."**

**ARTIST/WRITER/THINKER, AUSTRALIA, UNDER 30, FEMALE**

# CIFS REMARKS

***"The metaverse may be virtual, but the impact will be real."*** **Even though the metaverse will most likely develop the way Meta or other tech giants are predicting, this delphi study underlines the possible impacts and the need to take the metaverse seriously.**

**The current state of the metaverse is something that is being continuously debated. Even though 63% of the expert panellists believe that the metaverse already exists in some form, we believe it is still too early to say that we are in the metaverse as we define it (see introduction). In our opinion, the metaverse is in its very infancy, and we are only experiencing fragments of what it might eventually become – fragments that we refer to as 'betaverses' and 'metaspaces'. This is of course very difficult to assess in a coherent way, due to the many different and divergent views of what the metaverse is and what it encompasses.**

**Some think that just being connected to the internet is enough to be in the metaverse, while others believe that the metaverse requires technology that doesn't exist yet and won't for many years to come. This makes it necessary to look at the qualitative comments made by the panellists to get a clearer feeling of what the real consensus (or lack thereof) is.**

**While most panellists agree on what the metaverse can be and what its impact will be, there is more disagreement on the timeframe: How soon will we have a mature metaverse (as defined by Gartner), and how quickly will users adopt it and adapt to it? Optimism bias may play a role here, with panellists enthusiastic about the metaverse underestimating the time, funding, and technology required to develop and build it. For this reason, CIFS leans towards a moderately longer timeframe than the consensus reached by the panel.**

# Issues to be considered

When advancing the dialogue on the future of the metaverse there are still a plethora of issues to be considered and addressed.

Overall, the delphi study shows that there is an immediate need to establish a common vocabulary for comprehending the metaverse to kickstart and advance the dialogue. We need to be clearer on what precisely we mean by "the metaverse", what precisely the technological requirements are for a mature metaverse, and what the success criteria – including use level and user demographics – are for determining when we have reached the metaverse.

**Overall, the delphi study shows that there is an immediate need to establish a common vocabulary for comprehending the metaverse to kickstart and advance a dialogue**

A strong majority of panellists want the metaverse to be open and democratic rather than owned and controlled by commercial interests – but a majority fear that the latter will be true. This could suggest that if the development of the metaverse is left to big tech companies, it may not turn into the kind of metaverse that most people desire (if the desires of the panellists reflect the desires of future users). If so, measures to ensure the openness and democratisation of the metaverse need to be widely discussed and implemented. A major issue in this regard is the ability of users to move their created or purchased content between metaspaces and competing platforms.

A lot of panellists are worried about user security: Will user data be harvested without users' knowledge or approval? Will they retain rights to the content they create? Will they be targeted by scammers or cyberbullies? Will children and teens be targets of ill-intentioned individuals posing as others? Is addiction an issue that needs to be addressed? It is likely a good idea to address these and other predictable security issues before they arise, either through regulation by authorities or industry self-regulation. In order to establish security, it may be required for users to provide evidence of their physical-world identities; however, this may come at the cost of decentralisation. The global nature of the metaverse may make this difficult to achieve in all jurisdictions, and users should possibly (if technically possible) be warned about connecting to unsafe nodes or jurisdictions.

Another common concern is the availability of access to the metaverse. Will the cost of necessary equipment – including broadband internet connection – exclude many potential users? Will rural regions, especially in developing countries, be left out of the loop? What can be done to ensure equal opportunities for all in the metaverse? Should access to the metaverse perhaps be a human right, or will it just be a playground for the global middle class with no real impact on real-world opportunities?

With the emergence of the metaverse, a new kind of literacy has become necessary. The panel mentions the need to educate both users and regulators about the nature of the metaverse and its inherent dangers. Education in 'Metaliteracy' could be a way forward. Metaliteracy is a framework for understanding the new dynamics and the need for critical thinking in the digital age.

The term Metaliteracy is not yet completely defined, but it challenges the conventional skill-based approaches to information literacy by incorporating the emerging technologies such as immersive technologies, artificial intelligence and social media.

Education in Metaliteracy should start already in public school, and parents of young children should also be made aware of dangers like abuse and misinformation. Universities should actively share their research with decision makers to prevent decisions being made on an uninformed basis, and the role of public service media could be to assure that the users learn to navigate the increasingly complex media landscape.

# Contributors for the Metaverse Delphi Study

Aditya Mani, Founder, YOLOgram Style Private Limited

Alex Zhukevich, Founder, NFT Moon Metaverse

Alison Alexander, Co-Founder & Director of Ethics & Social Policy , Metacampus.ai

Alistair Pernigo, Synaesthetic Technologies Visionary, SMILLE

Andrea Lorini, Head of Collabs & Head of NFTs, Metaverse and Gaming

Andy Fidel, XR Creative Producer

Bosco Bellinghausen, CEO, alissia

Camille Merré, International Innovation Manager, former Chief Metaverse Officer

Caroline Stedman Mishra, Creative Technologist & Consultant

Dauda Sulaimon Abiola

Diana Velasco, Artistic Director, Museum of Nordic Digital Art - MoNDA

Dr. Dirk Lueth, Co-founder & Co-CEO Uplandme, Inc.

Dr Mark van Rijmenam, Strategic Futurist & Founder, The Digital Futures Institute

Dr. Vanessa Julia Carpenter, PhD, Chief Innovation Officer, Gagarin, Director and Interaction Designer, Kintsugi Design

Dirk Songuer

Esther O'Callaghan, OBE, Founder, hundo.xyz

Fatemeh Monfared, Chief Metaverse Architect & Founder, Spaces DAO

Felix Lück, Senior Project Manager Metaverse, HUGO BOSS AG

Gem Barton, Futures lead, Royal College of Art

Grace Zakka, Senior Project Manager, EBU - European Broadcasting Union

Invest in Denmark, Ministry of Foreign Affairs of Denmark

I. Ozkan, Founder & CEO, METAZO

Jakob la Cour, performing artist and immersion designer

Jakub Motyl

JoAnn Holmes, Digital Assets & Intellectual Property Attorney, Holmes@Law, LLC

Josephine Eyre

Juan Fuentes, Delegate in the Nordic countries, LaLiga

Kadine James, CEO & Founder, The Immersive KIND

Kavya Pearlman, Founder & CEO, XR Safety Initiative (XRSI)

Kevin Abanto, Studio Kevin Abanto

Krishna Bhawanidin

Laura Ellis, Head of Technology Forecasting, BBC

Lina Survila, Head of Marketing and Public Relations, Droffo, Vroomway, The Wearables Daily

Lisa M. Lum, Founder, Friends of the Metaverse

Louis Rosenberg, VR / AR Pioneer

Luca Lupattelli, Digital Project Manager, Hexagon Geosystems

Lucy Kueng

Lumo Media Lab

Marcus Bläsche, CEO & Co-Founder, Rumble League Studios

Martha Boeckenfeld, Dean & Partner, Metaverse Academy

Martin Berg, CEO, DX

Michelle Cortese, Design Lead Manager at Meta, Adjunct at NYU

Mônica de Carvalho Pereira, CEO & Founder, Love4u Academy

Noam Levavi, ByondXR

Oliver Anton, Project Manager & Spokesperson, Ungdomsbureauet (The Youth Bureau)

Patrik Löwendahl, Global Head of Metaverse Service Hub, Avanade

Pernille Tranberg, Co-founder, DataEthics.eu

Rafael Pagés, CEO & Founder, Vologrames

Remco Sikkema

Salman Wasim Saeed Halawi, Founder, Metadesignerz

Samantha Tauber, Founder, Director, Chief Metaverse Officer, VNCCII Pty Ltd

Sander Duivestein, Author of "Real Fake"

Sarah Stevenson, Founder, Unseen

Sasha Wallinger, Founder

Saskia Groenewegen, Solution Lead XR, Ordina

Sidarttha Bezbora, CEO & CPO, Metavoax Tech Inc

Simon Lajboschitz, Co-Founder, Khora.com

Simone Puorto, Travel Singularity, Hospitality Net

Soh Wan Wei, Founder, IKIGUIDE Metaverse Collective

Stina Gustafsson, Freelancer

Tim Walther, Metaverse & NFT, Volkswagen AG

Wouter Quartier, Head of Digital, Transformation and Platforms, EBU - European Broadcasters Union

***The remaining contributors prefer to stay anonymous.***

# METAVERSE GLOSSARY

**Sources:**
Merriam-Webster Dictionary
Metaliteracy.org
Copenhagen Institute for Futures Studies

**For video explainers on selected terminologies see 'A Futurist's Guide to the Metaverse' bit.ly/guidemetaverse**

# A

## Augmented Reality (AR)

Augmented Reality is an enhanced version of physical reality created by using technology to overlay digital information on an image of something being viewed through a device. Some examples of AR technology at use include Instagram filters, Snapchat's lenses and Pokémon Go.

## Avatar

An avatar is a virtual character that represents an individual in the virtual environment. Avatars can be static or animated, and many of us will already have some experience with them as images on social media or characters in games.

## Betaverse

Today, we see fragments of what will eventually become the metaverse – fragments that we call 'betaverses'. We believe there exists a confusion of these 'betaverses' with 'the metaverse', wherein individuals and companies believe the fragments we see today are true metaverses. The betaverse is something we 'dial into', not a metaverse that we automatically log into whenever we use the internet.

# B

## Blockchain

A blockchain is a platform that allows a network of computers, rather than a central authority, to maintain and update a shared database of proof of ownership and verified data. A blockchain can also be described as distributed ledger technology (DLT). This distributed ledger uses cryptography to confirm, carry out, and secure actions and transactions.

# C

## Creator Economy

The creator economy is a software-facilitated economy allowing creators to earn revenue from their creations. Examples of creator economy software platforms include YouTube, TikTok, Instagram, Facebook, Twitch, Spotify, Substack, and Patreon. Virtual worlds in the metaverse are set to depend largely on content creation by creators (both by humans and AI), who will contribute content and experiences for other users to interact with.

# D

## Decentralised Autonomous Organisation (DAO)

A DAO is an organisation constructed by rules encoded as a computer program that is often transparent, controlled by the organisation's members and not influenced by a central government – they are member-owned communities without centralized leadership. Blockchain technology, digital protocols and smart contracts are used to enforce the DAO's rules, governance structure, and decision-making process. Currently, an increasing number of metaverse initiatives use DAOs to provide users with voting rights and influence over the project's development, thereby making the metaverse more participatory and community driven.

## Digital Asset

A digital asset is anything that exists only in digital form and comes with a distinct usage right. Types of digital assets include, but are not exclusive to photography, logos, illustrations, animations, audio-visual media, digital paintings, text documents, electronic mails, websites, and a multitude of other digital formats and their respective metadata.

## Diminished Reality (DR)

Diminished reality is a form of computer-assisted reality that enables you to remove, conceal, or delete physical objects or sounds from your environment via

the use of technology. Information from your environment is then replaced with seemingly believable backgrounds, objects, or sounds.

## Extended Reality (XR)

Virtual and augmented reality, as well as mixed reality, are all included under the broad term 'extended reality', referring to all physical-and-virtual combined environments and human-machine interactions generated by computer technology and wearables. By bringing all of this together, extended reality may offer a wide range of new possibilities in both real and virtual worlds like the metaverse.

E

## Generative AI

Generative AI is a term used for artificial intelligence that creates content for virtual reality and other purposes. Image- and text-generating AI services like ChatGPT and Midjourney are examples of generative AI, but generative AI can also be used to create detailed virtual environments, as in the game No Man's Sky, where 18 quintillion planets are created by AI with details down to individual animals, plants and rocks.

G

## Haptic Technology

Haptic technology, or haptic interfaces, refers to any technology that can create an experience of touch or manipulation of virtual features by applying forces, vibrations, or motions to the user. These technologies can be used to create virtual objects in a computer simulation, to control virtual objects, to enhance remote control of machines and devices or to experience physical feedback from virtual experiences. Simple haptic devices are common in the form of game controllers and joysticks but can also be experienced in haptic suits. The word haptic, from the Greek: ἁπτικός (haptikos), means *"tactile, pertaining to the sense of touch*."

H

## Interoperability

Interoperability is a characteristic of a product or system to work with other products or systems. In the metaverse it applies for the ability for identities, digital assets, and virtual experiences to travel unchanged across platforms or metaspaces.

I

## Internet of Things (IoT)

The Internet of Things refers to physical items that are equipped with sensors or other forms of technology that can communicate with other devices and systems using the internet or other forms of electronic communication.

## Metaliteracy

Metaliteracy promotes critical thinking and collaboration in a digital age, providing a framework to participate in social media and online communities. Metaliteracy challenges traditional skills-based approaches to information literacy by recognising related literacy types and incorporating emerging technologies.

M

## Metaspace

Virtual worlds and digital layers augmented on top of our physical world. We believe that in any version of the metaverse, a user will be able to access one or more home spaces with ways to be connected to selected private or public digital environments – metaspaces – for all sorts of purposes.

## Metaverse

In our view, the current understanding of what the metaverse stands for is the seamless convergence of our physical and digital lives. A core aspect of this convergence will be a set of interoperable virtual spaces where we can work, play, learn, relax, socialise, communicate, interact, transact, and own digital assets.

These spaces will create a sense of belonging – bringing people, spaces, and things together in virtual or augmented digital worlds. The term was first coined by Neal Stephenson in his 1992 science fiction novel *Snow Crash*.

### Metawashing

A term used to describe companies that claim to be part of the metaverse based on a simple immersive or blockchain-based initiative that cannot be considered a real metaverse, as we define it.

### Mixed Reality (MR)

In mixed reality, virtual components are anchored to matching physical elements in your surroundings, or vice versa; you may still physically interact with things and surfaces, but their look and responsiveness may be augmented virtually or reproduced in virtual environments. Mixed reality experiences are neither purely physical nor purely virtual, but rather a combination of the two. Extended reality (XR) is more of an umbrella term (see definition).

### Non-Fungible Token (NFT)

A Non-Fungible Token is a digital certificate of authenticity of ownership of any given digital asset secured on a blockchain. It is used to certify authenticity and ownership, as the data of each NFT can be tied to digital files like images, music, collectibles, avatars, and more. NFTs are unique and non-interchangeable (non-fungible). An NFT can also carry additional rights and benefits with it, often referred to as a utility NFT. An NFT can be transferred by its owner, allowing NFTs to be sold and traded. Because NFTs are uniquely identifiable, they differ from cryptocurrencies, which are fungible, and many Web3 believers see NFTs as the new pathway to having true ownership over digital assets.

### Social Token

A social token is a form of cryptocurrency used to monetise a brand. It can be personal (a creator tokens) or a community token. Social Tokens provide creators with way to be compensated via the sale of tokens, with buyers receiving special perks such as meet-and-greets with the creators. The rewards associated with each token are determined by the creator and gives holders a sense of belonging to a certain community.

### Virtual Reality (VR)

Virtual reality (VR) is an immersive, interactive, computer-generated environment. The word 'virtual' refers to a digital copy or simulation of a physical object that exists on a computer or computer network. Users can be fully immersed in these simulated realities with the help of dedicated VR headsets, haptic devices, and even environmental feedback, enabling a virtual three-dimensional 360-degree view in a virtual world that people can experience and interact with.

### Web3

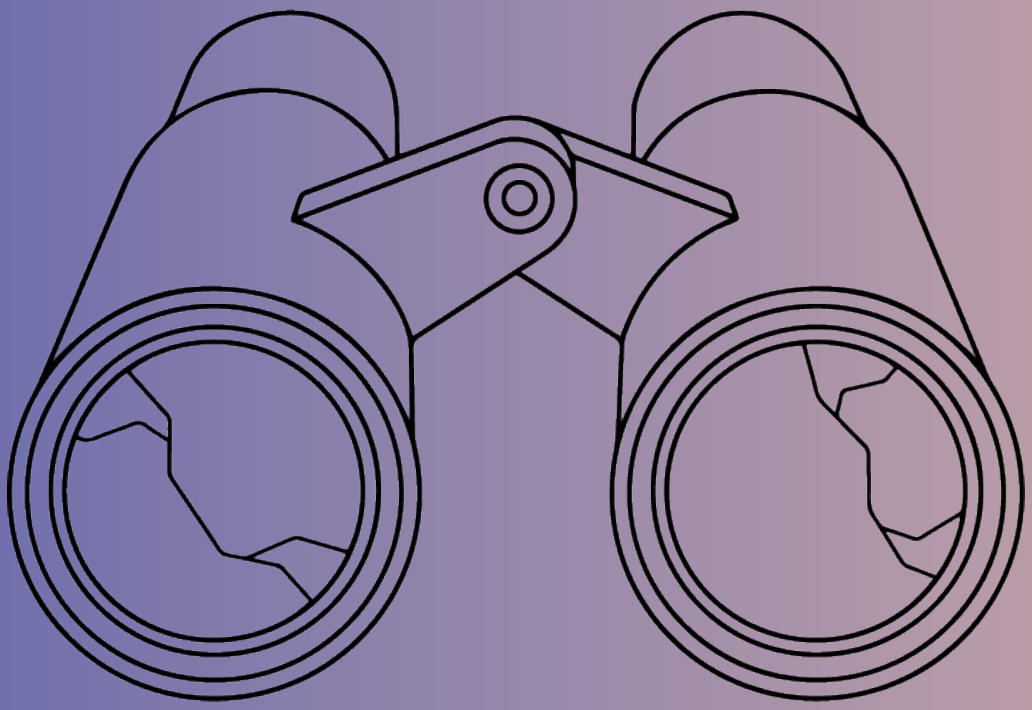
Web3 (also known as Web 3.0) is a proposed new iteration of the World Wide Web based on blockchain technology, which incorporates concepts such as decentralisation and token-based economics. Web3 has been associated with the rise of technological advancements like blockchain, NFTs, decentralised autonomous organisations (DAOs) and the metaverse, ushering in a new form of the internet based on peer-to-peer transactions, transparency, and data democracy. The term was coined in 2014 by Ethereum co-founder Gavin Wood.

N

S

V

W



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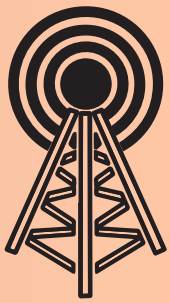

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## Feel free to reach out

*Contact Futurist, Senior Advisor and Head of Media, Sofie Hvitved, shv@cifs.dk.*

## Read more about the future of the metaverse

*cifs.dk/metaverse*