Discover

Perspective

The societal impact of the metaverse

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Abstract

In the 1920s developed a new artistic and cultural movement called "Surrealism", which not only included the revolutionary paintings and sculptures, but also philosophical texts and novels. Around 100 years later, the arrival of the Metaverse with its independence of physical laws promises to bring Surrealism to a next level. On the other hand, the pure market power of some of the companies developing their concepts may limit this potential freedom for the users. As observed with social media platforms, inside the initial competition, various providers had to close their platforms, leading to today's oligopoly. This means less choice for the users and a stronger position of the providers to create solutions maximizing their economic benefit. Today, independent companies work on their visions of the Metaverse, but unequal starting positions may make it difficult for them to compete with the established competitors. Similar to the attractivity of social media, also the Metaverse requires a high number of active users and service providers (private companies, but also governmental offices), fostering the tendency to an oligopoly. Based on literature, economy, psychology, and art, this paper discusses the opportunities and risks of the Metaverse, including an outlook on a predicted societal impact, especially laying its focus on the holistic connections of the different points of view. As the Metaverse only appeared in smaller parts yet, academic papers are still lacking. One aim of this article is to start an academic discussion. So far, actual concepts had been widely inspired by popular science fiction novels, ignoring Ray Bradbury's thoughts: "It's 'prevent the future,' that's the way I put it. Not predict it, prevent it".

1 Introduction

The term "Metaverse" was originally coined by author Neal Stephenson for his 1992 novel "Snow Crash", describing a three-dimensional social platform [1]. It was not the first time that such a virtual reality had been described, as it was already earlier defined by Daniel F. Galouye in "Simulacron-3", here even as an economic (market research) project [2]. Most impact on modern pop culture had Ernest Cline's "Ready Player One" [3]. It presents a world marked by energy crisis, overpopulation, and climate change. The fictive eccentric tech-millionaire James Donovan Halliday created "The Oasis", very similar to today's concepts of the Metaverse.

Different experts present different outlooks what the Metaverse should be. This article uses the definition of the author and former Head of Strategy at Amazon Studios, Matthew Ball, as he defines the Metaverse as persistent, synchronous & live, providing each user with an individual sense of "presence", a fully functioning economy, bridging the digital and physical worlds, offering unprecedented interoperability of data, digital items & assets, and content. Comparable to today's social media created and operated by a high number of contributors, as shown by the provider of market and consumer data Statista [4]. Based on today's computer power, the Metaverse mostly manifests as 3D environment with user-controlled avatars. Even though, based on Ball's definition this is no mandatory requirement. The independent

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project "Online Town" presented a meeting platform based on retro 2D graphics [5]; and even a text only description of the environment would be possible. With that the Metaverse would circle back to 1980's roleplay games and text adventures, as described in "Ready Player One".

2 Two concepts of the metaverse

Various companies develop their approaches to the Metaverse, including that Linden Lab launched its platform "Second Life" already back in 2003. Animoca Brands works on the "The Sandbox". As the company comes from the video game market, it focuses strongly on the gaming-side. Engage develops a Metaverse platform with the target on companies and learning. Understanding that the laws of physics do not apply, its future platform "Engage Linked" presents floating gardens and offers all habitants to stay at the same apartment, like living in parallel worlds, before joining the different meetings, presentations and lectures [6]. In the following, this article focuses on the concepts of the two biggest players in the market, Meta Platforms and Microsoft. The first company's concept is a universal user platform, integrating a high number of services known from other websites and the physical world into the Metaverse to maximize the user's time spending on the platform. In difference to that, Microsoft focuses on professional usage, connecting companies, technologies, processes, and employees. Both concepts blur, as traditional work-life concepts broke up and still are in a flow.

Mark Zuckerberg underlined his perception of economic importance (including monetarization) of the Metaverse with rebranding Facebook Inc. into Meta Platforms, Inc. in 2021. As a first step he acquired the rights to the name "Meta" from a US bank for a cost of 60 million USD, [7] in the following other direct and non-direct costs applied. His vision/ aligns with Ball's definition, but also, he explained in the podcast "The Tim Ferris Show" that it is based on various science fiction novels, particular referencing "Snow Crash" and "Ready Player One" [8]. Halliday may had been inspired by Zuckerberg, while Zuckerberg seems to follow the steps of this fictive character, even if the Meta Platforms CEO concluded that all mentioned books describe dystopias, and not shiny utopias. Considering Ball's definition, not an evolution for Meta Platforms, but a continuous evolution, as Facebook's strategy includes maximizing the time its users stay on the platform. To achieve this, companies and other organizations have their pages and groups on the portal, including news outlets. Based on data by Statista, even if the average time a user spends a day on Facebook reduced from 39 min in 2017, to 33 min in 2022, this is still more than on any other platform [9].

A different Metaverse concept comes from Microsoft, less aiming at consumers but corporations, including the involvement of the existing Digital Twin environment and the company's communication platform Teams. The including of Digital Twins into the Metaverse offers the ability for learners to experiment with a test version of the actual machinery, learn the handling and study the impact on potential changes. The physical and digital world bridge, as employees can remotely operate a machine inside the Metaverse, while these changes also the performance of the physical twin. On the other hand, employees standing at the physical machine can via Augmented Reality glasses, or directly the smartphone, access the Metaverse to read manuals, write protocols, work with real-time data, and even interact with other avatars.

3 The market

US research company Gartner predicts that by 2026, 25% of the global population will spend at least one hour per day in the Metaverse. This includes many aspects of daily life, such as education, work, and leisure activities. In this prediction, 30% of the world's organization will offer products and services in and around the Metaverse [10]. Already today, acting in the Metaverse (including multi-player games) has comparable costs to the physical world. The owners of the different platforms sell real state, clothes have their price tags, and vehicles are not for free. Especially luxury brands discovered NFTs as a new potential business model. International copyright laws apply also inside the Metaverse to ensure the expansion from the physical to the virtual world.

In opposite to George Orwell's "Nineteen Eighty-Four" [11], no surveillance cameras are needed anymore. The complete motions of an avatar could be stored in its log, including small gestures and eye contacts. Similar happens in today's video games. Algorithms can use this information and assume on the person's character, needs, and wishes. Nevertheless, such direct conclusion is deceptive, as personal values do not directly trigger behavior, but other factors as social norms, beliefs and attitudes must be included. An algorithm would require a high amount of information about a person to conclude from its observed behavior to underlying values and attitudes. Considering the Overtrust into AI Bias, as for example identified in an emergency evacuation experiment by Robinette, Li, Allen, Howard and Wagner, conducted at the Georgia Institute of

Technology [12], paired with Tech Industry's optimism to solve all problems with Artificial Intelligence (AI), we can assume that such algorithms will be tried to develop and independent from their vulnerabilities, deployed by various companies.

4 Psychology

As everyone has different values, information, experience and sensors, everyone perceives its environment differently. As human sensors like eyes, ears, nose, tongue, and skin does not work without conscious or subconscious interpretation of the received data (through the brain, or also the coordination of the spine volume and cord); all individuals philosophically inhabit different worlds. An article by Harris, Carnevale, D'Amour, Fraser, Harrar, Hoover, Mander and Pritched concluded: "Before a unified perception of the world can be formed, sensory signals must be processed with reference to body representation. The various attributes of the body such as shape, proportion, posture, and movement can be both derived from the various sensory systems and can affect perception of the world." [13] The Metaverse offers the possibility to represent the individual's physical body, but also the user may choose a complete different one, up to fictive surreal creatures. If since early childhood people act in both, the virtual and physical reality, they perceive the combination as one reality. Interpretation of stimuli coming from the sensors may get interpreted through the experience of the various body representations, so that behavior in the physical world also depends on the learned in the Virtual Reality, and vice versa.

Humans are not continuously self-aware. Duval and Wicklund defined in their Objective Self-awareness theory a self-system consisting of a self (a person's knowledge of themselves) and standards (correct behavior based on own's values and attitudes). The scientists concluded that the individual aims for internal consistency, behavior; attitudes, and values must be aligned. If not, a change must occur, or self-focus must be avoided [14].

5 Surrealism

The Metaverse is surreal, not limited to the law of physics. The name "Surrealism" had been coined by André Breton and Philippe Soupault and defined inside the "Manifeste du surréalisme" (French for "Manifesto of Surrealism"): "Surrealism is based on the belief in the superior reality of certain forms of previously neglected associations, in the omnipotence of dream, in the disinterested play of thought." Surrealism is no absolute state, but temporary, as famous authors and artists switched between realism and surrealism [15], similar to today's user between physical and virtual reality. Surrealism requires the will and force to believe in it.

A typical cliché about Iceland is that half of its citizens believe in trolls and elves. This also related to a survey conducted by a local newspaper back in 1998. The results had been that around 50% of men and even 60% of women stated that they believe in these magical creatures. The survey gave the participants only two possible answers: "yes" and "no". Later polls had been more sophisticated and offered the participants more possibilities on how to answer. The updated results: only a smaller number of people stated to believe in elves and trolls. As these mythical beings are a strong part of the Icelandic culture, "people are unwilling to deny their existence", even if they not directly believe in them. In daily life this leads to the fact that in Iceland l places are considered to be supernatural, which also impact infrastructure projects [16].

Creating surreal worlds had been a topic already before computer technology. The poet and collector of surreal art, Edward James decided to mare surrealism real. In Las Pozas, Mexico, he created a 10,000-square meter garden around natural waterfalls, erecting massive sculptures, buildings, and steps into nowhere. Costs for this should had been around 5 million USD. Today it is a public garden, where visitors can experience Surrealism with all five main senses, something which the Metaverse still cannot offer [17].

6 An outlook into the future

The Metaverse may not only be differently interpreted by each user's brain, but it can also be differently manifest for each person. For example, the virtual 3D environment can be in divergent colors, virtual real estate can feature different architectural styles, up to that virtual cities are contrasting for each user, as buildings can be positioned differently, so that relevant places are near the user's home base. if avatars of different users meet inside the Metaverse, everyone will perceive the place differently, not only to the brain, but also as the algorithms may give each user different stimuli. Besides higher personalization, this approach could be also used to present the Metaverse in different levels of age restrictions.

Such technology is not free of risk, as it may get deployed for personalized advertising, which could be used for commercial and political purpose, but could also affect the user's health. With just small adaptions to brightness, colors and background sound, the algorithm might trigger the user's vulnerability to depression. The more information the platform has related the user, the higher the risk that inside the immersive experience it can manipulate the person.

According to Roberto Saracco, a Personal Digital Twin (PDT) includes its user's data and information, which can also feature its outer appearance and voice. If skills and knowledge get added, it evolves into a Cognitive Digital Twin (CDT) [18]. Connected to sensors and algorithm, such an PDT or CDT could semi or full autonomously act in a virtual environment, for example as a Digital Counselor, explaining the sophisticated Metaverse to the human. Due to hybrid work and home office, employees got used to spending more time with their pets, who as companion have the important function of stress relief. The Metaverse can mirror this, offering a companion to the user's avatar, this as emotional anchoring, but also in parallel function as interphase to the system and access to a knowledge database. Connected with the PDT, such a companion can filter the potentially relevant information, what reduces decision-making for the user.

Another question, what will do the avatars when the user is not connected? Disappear from the platform, freeze, or continue acting on the platform based on the user's observed past behavior? Maybe even connected with the user's CDT [17], to act as realistic as possible, as indicated by De Kerckhove, Henz and Saracco? The results would be a fully populated Metaverse, independent if the users are connected or not, not dissimilar from known computer games like "The Sims" [19]. The game's designer Will Wright received the inspiration for The Sims through his personal destiny, as he lost his home in the 1991 Oakland-Berkley Firestorm. His idea was to recreate his house virtually including its suburban lifestyle [20].

If avatars would continue with their activities based on the user's profile and history log, users may analyze their behavior and conclude from this to their own personal values and attitudes. Besides showing a daily life in a "SimCity"-like [21] environment, this may also be used for learning purpose. Based on an employee database (including technical skills, experience, and psychology) companies can predict potential behavior in risky scenarios. Such information may get used to determine required training. Furthermore, the data can be used to program simulations. Here the employee can observe what would be the consequences of its predicted behavior, and due to this learn from the scene and potentially adapt values, attitudes and / or behavioral scripts. Humans are sophisticated units, for this prediction of preferences and behavior includes a high uncertainty factor. Especially the usage of unbalanced data and biased algorithms can lead consciously or subconsciously to wrong predictions, which nevertheless could be perceived by the user itself or other interested stakeholders (for example an HR department) as probable possibility.

Back in the Metaverse, if the predicted behavior in a daily routine would be unrecognizable altered, so that the user would not detect the deviation, new behaviors might appear from which the user would have the impression that it would be triggered by own values and attitudes, but in fact would have been the result of an algorithm. The user observing its avatar would conclude that behavior is still aligned with values and attitudes. If such alterations would unrecognizably continue, users may conclude that underlying values are different than they originally had been, meaning that these new values replace the original ones. Such techniques could be used for subliminal advertising and political propaganda, leading to manipulation, fake news on completely new level.

Nick Bostrom's simulation hypothesis [22] holds that we all are living inside a gigantic computer-generated simulation, as we know from "Matrix'" [23], setup by a higher intelligence or even go further that we are nothing more than software of our-self and so our whole existence is only virtually. As fantastic as this sounds, such simulations may become reality, not created by Aliens, but humans. Artificial Intelligence gets more sophisticated, and if aims to imitate human-like behavior, even experts have problems in distinguishing it from human beings. A Metaverse platform allows users from all over the world to connect. Due to this, most users do not know each other from outside the platform. The more the Metaverse extends, or even include parallel versions, the less the possibility for a user to meet other humans. The relative loneliness may not be perceived by the user, as there are numerous other characters to interact with, in most of the cases controlled by an AI, which could be directly by the platform or other organizations, like for example external companies, as an evolution of today's chat-bots.

Salvador Dali was one of the leading figures of the Surrealism movement. The Dali Museum in St. Petersburg, Florida, was one of the first institutions to work on a CDT. Based on existing materials like biography, audio and video material, programmers created an CDT, able to interact with the museum's visitors. Voice, appearance, and interaction create a perfect illusion that Dali lives on. Including in a next step this Dali CDT into the Metaverse would allow users from all over the world to interact with the artist, without having the requirement to travel to the physical museum [24, 17].

Besides accounts from companies, human influencers, pets, or friends & family, there are also various accounts on Instagram by virtual influencers. Such characters may not include any kind of AI but are the CGI-product of a marketing and graphics teams, often including a voice and motion capturing actor. Today, these virtual influences are mostly created

as young and female. Examples like Lil Miquela have more than 3 million followers on Instagram, and for the responsible company the advantage that these virtual characters are controlled by the company, and due to this, less vulnerable to scandals as human influencers. Thanks to Augmented Reality, such virtual characters can already today interact on photos or videos with humans [25]. The Metaverse is the logical next step, as these CGI characters can be equipped with an AI algorithm to act semi-autonomously inside the Virtual Reality and so, interact with their human fans.

7 Conclusion: societal impact

The Internet started as a military project, the Advanced Research Projects Agency Network (ARPANET) in 1966. In Cold War times it was important to have a decentralized network to keep it functional, even if some servers would get destroyed. In 1981, universities had been added to enhance the exchange between the different research projects. The graphic interface World Wide Web was invented in 1989 [26], the starting point for the commercialization of the internet in the 1990s. Since then, it developed into a more centralized concept, as most users frequently stayed on their known pages (for example social media platforms). The Metaverse requires costly investments, according to Forbes, Meta Platforms alone invested 10 billion USD in 2021 [27]. Such high investments are high market entry barriers, so that an oligopoly market with a small number of platforms can be predicted, with the risk of a later monopoly (as the fictive "The Oasis" or "Metaverse").

Status June 6, 2022, Facebook's total value of company's shares was 516.31 billion USD [28]. Compared with grow domestic product (GDP) data provided by the World Bank for 2020, the company would be behind Belgium with a GDP of 521.81 billion USD and before Thailand with 501.64 billion USD [29]. Microsoft's total value of company's shares was 2.02 trillion USD [30]. With that, the company would be behind France with a GDP of 2.64 trillion USD and before Italy with 1.89 trillion USD [29].

In the physical world, cities with its public places belong to society, ruled by its government. For the Metaverse, this is different. Comparable to social media platforms or also physical commercial centers, they are and will be owned by companies, often tight to one single owner. As consequence, rules and regulations are tight to this organization. The culture embedded into the Metaverse may be different than the one from the user's geographical location. This can lead to cognitive dissonances, not only perceived by the single users, but also by governments. Big tech companies have higher annual turnovers than the budgets of many countries. This paired with higher levels of impunity may lead to developments that the Metaverse will force its rules to the physical world. In other cases, strong countries with effective execution of law can force their values on the companies, which will then enforce these regulations inside the Metaverse, not only for the users of the regarding country, but on global level. A risk that cultures from smaller or weaker regions may get under pressure. This effect is not only limited to conscious cultures, but also works on the subconscious levels, as values and attitudes can be included into the design of the platform itself, including colors, symbolic or behavior patterns by AI characters. Missing sensibility to such topics can lead to subconscious deviations to diversity and inclusion, in general, lead to all kind of deviations against fairness. The more immersive the experience, for example, with Virtual Reality (VR) glasses and / or touch sensitive gloves, the higher the risk of harm, as described by Egliston and Carter [31].

Even if a Metaverse platform will be used globally, users must comply with the laws from the physical region. This is important, as crimes occur also in the virtual reality, for example harassment, stalking, theft, eliminating or kidnapping of an avatar. If potential offender and victim are from different countries, laws may apply in addition to one another. This depending the strength of a country to expand its legal system internationally. The avatar may get perceived as a unique part of the user, any kind of violence against it, would have a relevant impact on the person, including if it would be committed while the user had been offline, and the avatar acted semi-autonomously. Perceived safety of the stay inside the Metaverse, but also in combination with consequences in the physical word, is imperative to attract users to stay. As described in "Ready Player One", it can be escapism, similar as the stay inside a well-protected commercial center.

So far, a new form of mass communication never completely replaced an earlier form. We can assume that the Metaverse will not replace existing social media platforms but reduce their usage. The change from social media to Metaverse depends on various factors, as for example, costs, content, and the promotion by perceived influencers. Physical and virtual worlds must compete for the user's time. The fading away of physical shops and commercial centers may accelerate the Metaverse. Internet can connect people from different regions and social levels, but also it can divide society, as we saw with social media, but even more, it may establish a new hierarchy, as individuals with sufficient budget may enjoy physical experiences like holidays, concerts, and cars, while lower level may experience this only on the Metaverse. According to Deloitte, an effect which could be fostered by the circumstances that Generation

Y and Z, grew up with internet, but struggle with finances, while earlier Generations achieved in general a higher level of financial safety [32].

Despite these risks, the Metaverse may attract everybody, as the decision is mostly not between physical and virtual experience, but both may add to each other. For example, before visiting a museum, users can prepare virtually, then visit the location, and after this, keep in contact with the institution's content via the Metaverse. An opportunity for both, as museums typically only display a minor part of its inventory. If a virtual museum could connect with the user's PDT, this figure may lead the individual through the museum's virtual basement and showing exact the pieces, which interest the user.

If we understand today's time used on social media and inside multiplayer games as base, we can conclude that virtual and physical reality will be perceived as one reality, but it will be far away from a 50:50 mixture, as besides all technical temptations, humans spend most of their time in the physical world. Due to this, the Metaverse will be an addon to the physical reality, perceived by the people as a part of one reality.

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