



Metaverse Navigator V1.0

created by Christoph Dröge

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1 Document on our own behalf

1.1 About me personally

My name is Christoph Dröge, I am 56 years old and have lived in Munich since 2003. I am the "inventor" of the Metaverse Navigator, an eBook in PDF format on the subject of the metaverse. I have been working on the creation of the PDF file since 2023. I registered with Gunnar Kessler and others, I immediately realized that I didn't need a homepage and didn't want to create a newsletter. I didn't want to sell anything. The Metaverse Navigator is therefore free of charge and can be redistributed at will. If you think that this document is valuable for you, you can transfer at least one Euro to my PayPal / IBAN account. You can leave me feedback via Gmail cdroege91@gmail.com. Have fun "browsing".



1.2 What is deep linking?

*In the context of the World Wide Web, **deep linking** is the use of a [hyperlink](#) to a specific, generally searchable or indexed [web content](#) on a [website](#).*

This eBook contains deep links to external websites over whose content the author of the eBook has no influence. Therefore, we cannot accept any liability for this external content. The respective provider or operator of the websites is always responsible for their content.

1.3 Copyright

The Metaverse Navigator version 1.0 may be distributed as desired. However, no changes may be made to the content. For this purpose, I have locked the document for changes with Adobe Acrobat. It is also possible to print this document.

1.4 Disclaimer

The Metaverse Navigator is an eBook in PDF format. Most of the hyperlinks are provided with citations. If someone wants to write a dissertation, diploma, master, bachelor or doctoral thesis, I would like to point out that this eBook does not meet the requirements for scientific work. At best, this document is suitable as a collection of material. Citation is at your own risk. Ask your professor what a proper citation concept might look like.

1.5 Target group

Who is this Metaverse Navigator aimed at? This eBook is intended for anyone who wants to find out more about the metaverse. This eBook can be distributed within the family. It can be sent to friends, fellow students, professors and colleagues at work. However, it is advisable to ask whether sending the eBook is generally desired.

1.6 Language variants

This eBook is available in German and English. The German version is converted into the English version with DeepL and then converted by Word into the PDF version. The PDF version is then protected against changes with Adobe Acrobat.

With DeepL, different language variants (e.g. French, Spanish, Italian) can be provided if required.

1.7 Download

Version 1.0 of the Metaverse Navigator is available in both German and English on the Facebook, Xing and LinkedIn portals.

2 Purpose of the document

This document is intended for the layperson who wants to get an overview of the metaverse. It is based on the book "The Metaverse - And how it will revolutionize everything" by Matthew Ball. My ideas have also been incorporated into the various sections. This document is provided as a PDF file. I call this document the "Metaverse Navigator" because it provides numerous HTML links for a quick start. The Metaverse Navigator serves as a complex guide. Its goal is to develop a common understanding of the Metaverse concept. Wikipedia - Quotations are emphasized (Times New Roman, 12pt, *italics*). The rest of the quotes are emphasized with Calibri, 12 pt, *italics*. My ideas and comments are formatted with Arial, 12 pt. The English-language HTML links were translated into German using the Google translator. The search results were determined using the web browsers Google and Bing.

3 Definition of the metaverse concept

3.1 Matthew Ball

"A massively scaled and interoperable network of real-time rendered 3D worlds that can be experienced synchronously and continuously by an effectively unlimited number of users with an individual sense of presence and continuity of data, such as identity, history, permissions, objects, communication and payments."¹ Source Matthew Ball

3.2 Wikipedia - DE

"The metaverse² is a concept in which a digital space is created through the interaction of virtual, augmented and physical reality. The main aspect here is to unite the various spaces of action on the internet into one reality. The concept is often described with a strong focus on virtual sociality; a future iteration of the internet in the form of persistent, shared, virtual 3D spaces that are connected to form a perceived virtual universe. These are intended to enable individualization and everyday activities on a comparable scale to physical reality.

Further developments for the metaverse are often linked to advances in virtual reality technology due to the desire for more immersion. Recent interest in the development of metaverses has been influenced by Web3, a concept for a new, decentralized generation of the Internet. Both the term Web3 and metaverse have seen increased use as buzzwords to exaggerate the development progress of various related technologies and projects for public relations purposes. Similar to the social media and video game industries, privacy, media addiction and user safety are considered heightened concerns within the metaverse." Source: Wikipedia

3.3 Wikipedia - EN

¹ Matthew Ball: The Metaverse - And how it will revolutionize everything, p.43

² Page "Metaverse". In: Wikipedia. The free encyclopedia. Edited on January 20, 2021 01:22 UTC, URL: <https://de.wikipedia.org/wiki/Metaversum> (Retrieved 12/30/2023, 17:00 UTC)

"The [metaverse](#)³ is a hypothetical iteration of the internet as a single, universal and immersive virtual world, enabled by the use of virtual reality (VR) and augmented reality (AR) headsets. In colloquial usage, a "metaverse" is a network of 3D virtual worlds centered on social and economic connections. The term metaverse originated in the 1992 science fiction novel Snow Crash as a portmanteau of "meta" and "universe". Metaverse development is often linked to the advancement of virtual reality technology due to increasing demands for immersion. Recent interest in metaverse development has been influenced by Web3, a concept for a decentralized iteration of the Internet. Web3 and metaverse have been used as buzzwords to exaggerate the development progress of various related technologies and projects for public relations purposes. Privacy, user addiction, and user security are concerns within the metaverse that stem from the challenges facing the social media and video game industries as a whole." Source: Wikipedia

4 Introduction: How did I become aware of the topic of metaverse?

I got started via a podcast published by the German computer magazine Computerwoche. The next step was to order the book "The Metaverse – And How It Will Revolutionize Everything" from Amazon [\[DE\]](#) / [\[EN\]](#) and read it in one go two days later. This book made a deep impression on me and changed my view of the world forever.

³ Page "Metaverse". In: Wikipedia, Free Encyclopedia, Date edited: December 03, 2023, 10:08 UTC, URL: <https://en.wikipedia.org/wiki/Metaverse> (Retrieved 12/30/2023, 17:19 UTC

5 The beginnings: October 28, 2021. Marc Zuckerberg and the company Meta

[Letters from the founder⁴](#) / [Connect 21⁵](#) :

"We are at the beginning of the next chapter for the internet, and it's the next chapter for our company too.

In recent decades, technology has given people the power to connect and express ourselves more naturally. When I started Facebook, we mostly typed text on websites. When we got phones with cameras, the internet became more visual and mobile. As connections got faster, video became a richer way to share experiences. We've gone from desktop to web to mobile; from text to photos to video. But this isn't the end of the line.

The next platform will be even more immersive — an embodied internet where you're in the experience, not just looking at it. We call this the metaverse, and it will touch every product we build.

The defining quality of the metaverse will be a feeling of presence — like you are right there with another person or in another place. Feeling truly present with another person is the ultimate dream of social technology. That is why we are focused on building this.

In the metaverse, you'll be able to do almost anything you can imagine — get together with friends and family, work, learn, play, shop, create — as well as completely new experiences that don't really fit how we think about computers or phones today. We made a film that explores how you might use the metaverse one day.

In this future, you will be able to teleport instantly as a hologram to be at the office without a commute, at a concert with friends, or in your parents' living room to catch up. This will open up more opportunity no matter where you live. You'll be able to spend more time on what matters to you, cut down time in traffic, and reduce your carbon footprint." Source: Meta

[Mark in the Metaverse⁶](#)

⁴ Page "Founders Letter, In: Meta, Last updated: October 28, 2021, URL: <https://about.fb.com/news/2021/10/founders-letter/> , (Retrieved 12/30/2023, 17:35 UTC)

⁵ Page "Facebook Connect 2021", In Facebook.com, URL: <https://www.facebook.com/facebook/videos/577658430179350/> , (Retrieved 12/30/2023 17:42 UTC)

⁶ Newton, Casey: Mark in the metaverse, In: The verge.com, Last updated: July 22, 2021 14:00 UTC, URL: <https://www.theverge.com/22588022/mark-zuckerberg-facebook-ceo-metaverse-interview> , (Retrieved 12/30/2023 17:57 UTC)

6 The SnowCrash book

"[Snow Crash](#)"⁷ is a science fiction novel by the American writer Neal Stephenson, published in 1992. Like many of Stephenson's novels, its themes include history, linguistics, anthropology, archaeology, religion, computer science, politics, cryptography, memetics, and philosophy.

*In his 1999 essay "In the Beginning... Was the Command Line", Stephenson explained the title of the novel as his term for a particular software failure mode on the early Macintosh computer. Stephenson wrote about the Macintosh "When the computer crashed and wrote gibberish into the bitmap, the result was something that looked vaguely like static on a broken television set—a 'snow crash'". Stephenson has also mentioned that Julian Jaynes' book *The Origin of Consciousness in the Breakdown of the Bicameral Mind* was one of the main influences on *Snow Crash*.*

Snow Crash was nominated for both the British Science Fiction Award in 1993 and the Arthur C. Clarke Award in 1994.

n the 21st century, an unspecified number of years after a worldwide economic collapse, Los Angeles is no longer part of the United States since the federal government has ceded most of its power and territory to private organizations and entrepreneurs. Franchising, individual sovereignty, and private vehicles reign supreme. Mercenary armies compete for national defense contracts, while private security guards preserve the peace in sovereign gated housing developments. Highway companies compete to attract drivers to their roads, and all mail delivery is by hired courier. The remnants of government maintain authority only in isolated compounds, where they do tedious make-work that is, by and large, irrelevant to the society around them. Much of the world's territory has been carved up into sovereign enclaves known as Franchise-Organized Quasi-National Entities (FOQNEs), each run by its own big business franchise (such as "Mr. Lee's Greater Hong Kong", or the corporatized American Mafia), or various residential burbclaves (quasi-sovereign gated communities). In this future, American institutions are far different from those in the actual United States at the time the book was published; for example, a for-profit organization, the CIC, has evolved from the CIA's merger with the Library of Congress." Source: Wikipedia

⁷ Page "Snow Crash". In: Wikipedia, Free Encyclopedia, Last updated: November 22, 2023, 22:55 UTC, URL: https://en.wikipedia.org/wiki/Snow_Crash , (Accessed 12/30/2023, 18:09 UTC)

How it all began

In my view, the company Blaxxun is the forerunner of the 3D Internet - based on 3D clients and server environments. Wikipedia describes blaxxun as follows:

"[Blaxxun](#) Interactive⁸ originally called "Black Sun Interactive", was one of the first companies to develop a 3D community platform designed for the Internet using VRML and highly scalable multi-user server environments." Source: Wikipedia

Unfortunately, Blaxxun Interactive did not survive the dot-com bubble of the 2000s. The movie Ready-Player-One describes OASIS as a virtual simulation, which comes very close to the concept of the metaverse - as defined by Matthew Ball.

Wikipedia describes the movie as follows:

"[Ready Player One](#)⁹ is a 2018 American science fiction action film based on Ernest Cline's novel of the same name. The film was co-produced and directed by Steven Spielberg, written by Cline and Zak Penn, and stars Tye Sheridan, Olivia Cooke, Ben Mendelsohn, Lena Waithe, T.J. Miller, Simon Pegg, and Mark Rylance. The film is set in 2045, where much of humanity uses the OASIS, a virtual reality simulation, to escape the real world. A teenage orphan finds clues to a contest that promises ownership of the OASIS to the winner, and he and his allies try to complete it before an evil corporation can do so." Source: Wikipedia

7 Metaverse - Topics

7.1 Artificial intelligence and artificial neural networks

7.1.1 Oracle

The question I ask myself is: what role does artificial intelligence (AI) play in the metaverse? Artificial intelligence has the potential to threaten or even wipe out humanity. Especially when AI is used in the military sector, the threat is there. If the Americans and the Chinese use AI in the military sector, this is playing with fire and there is a possibility that this type of technology will be directed against humans. What is my position on the metaverse in connection with AI? AI has the role of an oracle that can answer queries. There will be several specialized oracles that provide expert knowledge for a specific area. For example, the oracles could provide expert knowledge on mathematics, physics, biology, history and other subjects. In my opinion, the most important (hardware) players in the field of artificial intelligence are Intel, AMD and Nvidia. The search queries related to "artificial intelligence", "neural network" and "hardware"

⁸ Page "Blaxxun Interactive". In: Wikipedia, Free Encyclopedia, Last updated: February 3, 2023, 06:17 UTC, URL: <https://en.wikipedia.org/wiki/blaxxun>, (Accessed 12/30/2023, 18:22 UTC)<https://en.wikipedia.org/wiki/blaxxun>

⁹ Page "Ready Player One". In: Wikipedia, Free Encyclopedia, Date edited: December 21, 2023, 23:00 UTC, URL: [https://en.wikipedia.org/wiki/Ready_Player_One_\(film\)#Cast](https://en.wikipedia.org/wiki/Ready_Player_One_(film)#Cast), (Accessed 12/30/2023, 18:35 UTC)

7.1.2 Intel

[HABANA AI](#): Powerful, highly efficient deep learning training and inference for the Large Scale Era

[Search | Intel - Metaverse](#)

[Search | Intel - Neural Network Hardware](#)

[Search | Intel](#)

7.1.3 AMD

[Xilinx](#)

[The "Zen" processor architecture](#)

[Search | AMD - Neural Network Hardware](#)

[Search | AMD](#)

7.1.4 Nvidia

[Search | Nvidia - Metaverse](#)

[Search | Nvidia - Neural Network Microprocessor](#)

[Search | Nvidia - Neural Network Hardware](#)

[Search | Nvidia](#)

7.2 Transhumanism and metaverse

"The word [transhumanism](#)¹⁰ comes from the Latin "trans": beyond, above, beyond and from the Latin "humanus": human.

It is generally a philosophical movement and school of thought that seeks to expand the biological limits of human capabilities (whether intellectual, physical or psychological) through the use of technological processes. Transhumanists believe that the next evolutionary stage of humanity will be achieved through fusion with technology. The technologies that we wear on our bodies today in the form of wearables will be inside us in the future. Cyborgs will take the place of humans.

Transhumanism can be divided into different currents, but in reality these are rarely clearly distinguishable from one another: Democratic transhumanism: a political philosophy that brings together liberal democracy, social democracy and transhumanism.

Singularitarianism: A movement based on the belief that a technological singularity - the creation of a superintelligence - is possible, and advocates deliberate action to bring it about in a safe form. This phase is seen as the transcendence of the human species.

The focus of the transhumanism movement is the application of new and future technologies. These include, among others:

Nanotechnology, biotechnology with a focus on genetic engineering and regenerative medicine,

Brain-computer interfaces, the uploading of human consciousness into digital memories,

Prosthetics: Improvement of the human body through prostheses,

Development of superintelligence, further development of cryonics." Source: Werner Eberwein

"The term technological singularity¹¹ is used to summarize various theories in futurology. It is predominantly understood as a hypothetical future point in time at which artificial intelligence (AI) surpasses human intelligence and thereby rapidly improves itself and makes new inventions, which would irreversibly accelerate technological progress to such an extent that the future of humanity would no longer be predictable after this event. The first

¹⁰ Page "What is transhumanism?", as of October 17, 2018 URL: <https://werner-eberwein.de/was-ist-transhumanismus/> , (Retrieved 12/30/2023, 21:25 UTC)

¹¹ Page "Technical singularity". In: Wikipedia, Free Encyclopedia, Last updated: September 15, 2023, 10:51 UTC, URL: https://de.wikipedia.org/wiki/Technologische_Singularit%C3%A4t, (Accessed 12/30/2023, 21:32 UTC)

superintelligence would thus be humanity's last invention, as later innovations would be developed by machines largely independently of human actors.

*The term was popularized by the 2005 book *The Singularity Is Near: When Humans Transcend Biology* (German title: "*Menschheit 2.0: Die Singularität naht*") by US computer pioneer and author Raymond Kurzweil, who estimates the date of the Singularity to be 2045.*

The predicted time of the singularity has been postponed several times by futurologists by decades into the future. However, it is likely that it will come as a surprise, possibly even for those involved in its development. The development of a seed AI describes one of these scenarios.

The term is closely associated with the theories and ideas of transhumanism. Some of its proponents believe that the associated technological progress could significantly increase human life expectancy or even achieve biological immortality." Source: Wikipedia

7.2.1 Humanity 2.0 / Singularity (Book by Ray Kurzweil - [DE](#) - [EN](#))

*"[Menschheit 2.0](#)"¹². *Die Singularität naht* is the German translation of Ray Kurzweil's classic of transhumanism *The Singularity Is Near. When Humans Transcend Biology*, which was published in 2005. This work focuses on the so-called technological singularity, a revolutionary event that the author estimates will occur in 2045, and the far-reaching consequences that this event will have for humanity.*

The central thesis of the book is that technological growth - contrary to our intuitive understanding - is not linear but exponential in all areas as soon as they are subject to information technology. Because information technology is penetrating more and more areas of knowledge and science, such as biology or neuroscience, our entire knowledge and therefore also our technical possibilities are growing exponentially. Exponential growth has a "kink in the curve", from which the seemingly slow and steady growth suddenly increases explosively. This kink is expected to be reached in 2045 and will lead to an explosive increase in human knowledge and technical possibilities. This event, which Vernor Vinge has called the "technological singularity" since the 1980s, will fundamentally change humanity." Source: Wikipedia

¹² Page "Humanity 2.0". In: Wikipedia, Free Encyclopedia, Last updated: February 1, 2023, 10:43 UTC, URL: https://de.wikipedia.org/wiki/Menschheit_2.0, (Retrieved 12/31/2023, 16:50 UTC)

7.2.2 Altered Carbon (Book by Richard Morgan - [DE](#) - [EN](#))

*"[Altered Carbon](#)"¹³ - The Immortality Program (original title: Altered Carbon) is an American cyberpunk and detective story television series created by Laeta Kalogridis. The series is based on the book *The Immortality Program* by Richard Morgan, which was published in 2002. The first season comprises ten episodes and was released for streaming on Netflix on February 2, 2018. In July 2018, it was announced that a second season had been ordered by Netflix. The eight-episode second season was released on Netflix on February 27, 2020. In August 2020, the series was canceled after two seasons.*

*In November 2018, Netflix announced a movie for the series. *Altered Carbon: Resleeved* was released on March 19, 2020. It is an anime that is intended to expand the story and the series universe.*

The series is set in the 24th century in a dystopian world in which it is possible to store one's consciousness and memories on a so-called cortical stack and have them transferred across galactic distances to other bodies (clones), called sleeves. Due to the potential immortality of consciousness, the killing of a body is only considered damage to property, only the destruction of a stack is murder. The extremely wealthy class in this society are referred to as Meths, alluding to Methuselah. They live in seclusion and are constantly buying or cloning new, young sleeves to prolong their lives. As they also regularly have a backup of their stack made, they are effectively immortal.

The plot centers on the renegade Slovakian-Japanese elite soldier Takeshi Kovacs, who, together with his sister, was part of the rebel group Envoy and is considered the last survivor of this group. The leader of the Envoys was Quellcrist "Quell" Falconer, the developer of the stacks, with whom Kovacs also had a relationship.

250 years after the death of his body, he is transferred to Earth in the body of a policeman. He receives an assignment from Meth Laurens Bancroft, who fears for his life as he has already been murdered and is only still alive thanks to his backup. During his investigation, Kovacs teams up with the AI Poe and the policewoman Kristin Ortega." Source: Wikipedia

¹³ Page "Altered Carbon - The immortality program". In: Wikipedia, Free Encyclopedia, Last updated: June 15, 2023, 22:24 UTC, URL: https://de.wikipedia.org/wiki/Altered_Carbon_%E2%80%93_Das_Unsterblichkeitsprogramm, (Retrieved 12/31/2023, 17:05 UTC)

7.2.3 Life 3.0 (Book by Max Tegmark- [DE](#) -- [EN](#))

"[Life 3.0](#)"¹⁴ : Being Human in the Age of Artificial Intelligence is a 2017 book by Swedish-American cosmologist Max Tegmark . Life 3.0 discusses artificial intelligence (AI) and its impact on the future of life on Earth and beyond. The book discusses various societal implications, what can be done to maximize the chances of a positive outcome, and potential futures for humanity, technology and combinations thereof.

The book begins by positing a scenario in which AI has exceeded human intelligence and become pervasive in society. Tegmark refers to different stages of human life since its inception: Life 1.0 referring to biological origins, Life 2.0 referring to cultural developments in humanity, and Life 3.0 referring to the technological age of humans. The book focuses on "Life 3.0", and on emerging technology such as artificial general intelligence that may someday, in addition to being able to learn, be able to also redesign its own hardware and internal structure.

The first part of the book looks at the origin of intelligence billions of years ago and goes on to project the future development of intelligence. Tegmark considers short-term effects of the development of advanced technology, such as technological unemployment, AI weapons, and the quest for human-level AGI (Artificial General Intelligence). The book cites examples like Deepmind and OpenAI, self-driving cars, and AI players that can defeat humans in Chess, Jeopardy, and Go.

After reviewing existing issues in AI, Tegmark then considers a range of possible futures that involve intelligent machines or humans. The fifth chapter describes a number of potential outcomes, such as altered social structures, integration of humans and machines, and both positive and negative scenarios like Friendly AI or an AI apocalypse.[5] Tegmark argues that the risks of AI come not from malevolence or conscious behavior per se, but rather from the misalignment of the goals of AI with those of humans. Many of the goals of the book align with those of the Future of Life Institute,[6] of which Tegmark is a co-founder.

The remaining chapters explore concepts in physics, goals, consciousness and meaning, and investigate what society can do to help create a desirable future for humanity" Source: Wikipedia

¹⁴ Page "Life 3.0". In: Wikipedia, Free Encyclopedia, Last updated: October 9, 2023, 3:53 UTC, URL: https://en.wikipedia.org/wiki/Life_3.0, (Accessed 12/31/2023, 17:15 UTC)

7.2.4 Chips in the brain (Movie: Johnny Mnemonic - [DE](#) - [EN](#))

"[Johnny Mnemonic](#)¹⁵ is a 1995 cyberpunk action film[6] directed by Robert Longo in his feature directorial debut. William Gibson, who wrote the 1981 short story, wrote the screenplay. The film, set in 2021, portrays a dystopian future racked by a tech-induced plague, awash with conspiracies, and dominated by megacorporations and organized crime. Keanu Reeves plays Johnny, a data courier with an overloaded brain implant designed to securely store confidential information. Takeshi Kitano portrays a yakuza affiliated with a megacorporation attempting to suppress the data; he hires a psychopathic assassin played by Dolph Lundgren to do so. Ice-T and Dina Meyer co-star as Johnny's allies, a freedom fighter and a bodyguard, respectively.

It was shot in Canada; Toronto and Montreal filled in for Newark and Beijing. The project was difficult for Gibson and Longo. After they struggled for years to finance a low-budget adaptation of Gibson's story, Sony greenlit Johnny Mnemonic with a \$26 million budget. When Reeves' previous film, Speed, unexpectedly became a major hit, Sony attempted to retool Johnny Mnemonic as a blockbuster. Longo experienced extensive creative differences with the studio, who forced casting choices and script rewrites on him. The film was ultimately recut without Longo's involvement, resulting in a version that he felt did not reflect his artistic vision. Described by Longo and Gibson as originally full of irony, it was edited into a mainstream action film and received negative reviews from critics.

A longer version (103 mins) of the film premiered in Japan on April 15, 1995, featuring a score by Mychael Danna and more scenes involving Kitano. The film was released in the United States on May 26, 1995. In 2022, a black-and-white edition of the film, titled Johnny Mnemonic: In Black and White was released, which Gibson characterized as closer to his original vision" Source: Wikipedia

¹⁵ Page "Johnny Mnemonic (film)". In: Wikipedia, Free Encyclopedia, edited on December 30, 2023, 0:18 UTC, URL: [https://en.wikipedia.org/wiki/Johnny_Mnemonic_\(film\)](https://en.wikipedia.org/wiki/Johnny_Mnemonic_(film)), (Accessed 12/31/2023, 17:20 UTC)

7.3 Standards / Guidelines

[Metaverse Standards Forum](#)¹⁶ : Standards Cooperation for an Open and inclusive Metaverse.

"The consensus of the group is that open [standards](#)¹⁷ are needed to successfully develop the metaverse. The Metaverse Standards Forum is intended to drive these efforts and ensure that consensus-based collaboration takes place. Neil Trevett, President of Khronos comments: "The Metaverse Standards Forum is a unique venue for coordination between standards organizations and the industry, with a mission to promote the pragmatic and timely standardization that is essential to an open and inclusive metaverse." Source Swiss IT Magazine

"[Metaverse Standards Forum](#)¹⁸ discussions have become commonplace among technology enthusiasts. The forum is vital to the future of the metaverse. And the metaverse itself is an essential part of our technological future. This relationship means that the forum is undoubtedly essential. And you will soon discover what it is, what it has achieved and what you can look forward to in the future." Source: Metamandrill

Concepts for a new version of the Internet can be found [here](#)¹⁹ .

Wikipedia says the following about Web 3:

"[Web3](#)²⁰ (sometimes spelled web3, often incorrectly referred to as Web 3.0 (see terminology)) is an idea for a new generation of the World Wide Web (not to be confused with the entirety of the internet) based on blockchain technology and thus built on concepts such as decentralization and token-based economy. The term was coined in 2014 by Gavin Wood, a co-founder of Ethereum. From around 2021, the idea attracted increased interest from cryptocurrency enthusiasts, large technology companies and venture capital firms.

¹⁶ Swiss IT Media GmbH: Metaverse Standard Forum: Tech giants define the standards for the metaverse (June 22, 2022), URL: https://www.itmagazine.ch/artikel/77417/Metaverse_Standard_Forum_Tech-Giganten_definieren_die_Standards_fuers_Metaverse.html, (Retrieved 12/31/2023, 17:54 UTC)

¹⁷ Trans4mation IT GmbH: The Metaverse Standards Forum (July 27, 2022), URL: <https://in4mation.blog/metaverse-standards-forum/>, (Retrieved 12/31/2023, 18:05 UTC)

¹⁸ Booker, Brien: Metaverse Standards Forum; What is it and why is it needed? (August 18, 2022), URL: <https://metamandrill.com/de/metaverse-standards-forum/>, (Retrieved 12/31/2023, 18:20 UTC)

¹⁹ WIN-Verlag GmbH & Co KG: Web3: 7 concepts for a new version of the Internet (10.11.2022), URL: <https://www.virtual-reality-magazin.de/web3-7-konzepte-fuer-eine-neue-version-des-internets/>, Retrieved 12/31/2023, 22:20 UTC)

²⁰ Page "Web3". In: Wikipedia, Free Encyclopedia, Last updated: October 16, 2023, 16:34 UTC, URL: <https://de.wikipedia.org/wiki/Web3>, (Accessed 12/31/2023, 22:28 UTC)

Some technologists and journalists have contrasted the ideas with the earlier buzzword Web 2.0, in which they say data and content are centralized primarily among a small group of companies sometimes referred to as "big tech." Source: Wikipedia

7.4 Infrastructure/networks

How will the infrastructure for the metaverse be designed? My idea is that Elon Musk's [satellite network Starlink](#)²¹ will be a backbone. There is also a satellite network from Amazon owner Jeff Bezos. The 5G network will not prevail. In individual cases, fiber optics will be used. The operating system for this backbone is Linux because it is open source. Basically, it can be said that the agreed standards and guidelines are open source and will run under the Linux operating system. The Linux operating system was chosen because it is manufacturer-independent. Windows 10 / 11 belongs to Microsoft, Apple's iOS belongs to Apple.

7.5 Darknet 3D

Just like the 2D Internet, the Metaverse as a 3D Internet will have an area that I call the Darknet 3D. This internet operates outside of legality. In this part of the metaverse, organ trafficking, sex, sex work, drug trafficking, slave trade with children, teenagers and adults will be possible. Businesses will be exposed to cyber threats. This is the area of organized crime. To protect this area, there will be a police force tasked with protecting the Metaverse user.

7.6 Intellectual property

How can intellectual property be protected in the metaverse? Wikipedia describes the term in the real world as follows:

"[Intellectual property](#)²² is a category of property that includes intangible creations of the human intellect. There are many types of intellectual property, and some countries recognize more than others. The best-known types are patents, copyrights, trademarks and trade secrets. The modern concept of intellectual property developed in England in the 17th and 18th centuries. The term "intellectual property" began to be used in the 19th century, though it was not until the late 20th century that intellectual property became commonplace in most of the world's legal systems.

Supporters of intellectual property laws often describe their main purpose as encouraging the creation of a wide variety of intellectual goods. To achieve this, the law gives people and

²¹ Page "Starlink". In: Wikipedia, Free Encyclopedia, Last updated: December 29, 2023, 11:18 UTC, URL: <https://de.wikipedia.org/wiki/Starlink>, (Accessed 12/31/2023, 22:35 UTC)

²² Page "Intellectual property". In: Wikipedia, Free Encyclopedia, Last updated: December 30, 2023, 23:23 UTC, URL: https://en.wikipedia.org/wiki/Intellectual_property, (Retrieved 12/31/2023, 22:40 UTC)

businesses property rights to certain information and intellectual goods they create, usually for a limited period of time. Supporters argue that because IP laws allow people to protect their original ideas and prevent unauthorized copying, creators derive greater individual economic benefit from the information and intellectual goods they create, and thus have more economic incentives to create them in the first place. Advocates of IP believe that these economic incentives and legal protections stimulate innovation and contribute to technological progress of certain kinds.

The intangible nature of intellectual property presents difficulties when compared with traditional property like land or goods. Unlike traditional property, intellectual property is "indivisible", since an unlimited number of people can in theory "consume" an intellectual good without its being depleted. Additionally, investments in intellectual goods suffer from appropriation problems: Landowners can surround their land with a robust fence and hire armed guards to protect it, but producers of information or literature can usually do little to stop their first buyer from replicating it and selling it at a lower price. Balancing rights so that they are strong enough to encourage the creation of intellectual goods but not so strong that they prevent the goods' wide use is the primary focus of modern intellectual property law." Source: Wikipedia

My idea is this: Virtual patent and trademark offices must be set up for products and trademarks in the metaverse. In addition, these goods must also be registered in the real patent and trademark office. Entries must be made in the virtual land register for houses and land in the metaverse. These entries function in accordance with German law.

7.7 Virtual reality

"Virtual reality"²³, or VR for short, is the representation and simultaneous perception of an apparent reality and its physical properties in a real-time, computer-generated, interactive virtual environment.

Virtual reality (VR) is a simulated experience that employs 3D near-eye displays and pose tracking to give the user an immersive feel of a virtual world. Applications of virtual reality include entertainment (particularly video games), education (such as medical, safety or military training) and business (such as virtual meetings). VR is one of the key technologies in the reality-virtuality continuum. As such, it is different from other digital visualization solutions, such as augmented virtuality and augmented reality.

Currently, standard virtual reality systems use either virtual reality headsets or multi-projected environments to generate some realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment. A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets consisting of a head-mounted display with a small screen in front of the eyes, but can also be created through specially designed rooms with multiple large screens.

²³ Page "Virtual reality". In: Wikipedia, Free Encyclopedia, Last updated: December 29, 2023, 02:42 UTC, URL: https://en.wikipedia.org/wiki/Virtual_reality, (Accessed 12/31/2023, 22:47 UTC)

Virtual reality typically incorporates auditory and video feedback, but may also allow other types of sensory and force feedback through haptic technology." Source: Wikipedia

7.8 Cryptocurrencies

You can find a first introduction to Metaverse and cryptocurrencies [here](#)²⁴ .
You can find the seven best Metaverse coins [here](#)²⁵ .

"The metaverse is a virtual world that, among other things, lets people interact with each other using digital avatars. And when people interact, business and money are a natural component.

Web3 has embraced the metaverse, and its tools are enabling the use of cryptocurrency in a world where traditional money can't function. In the metaverse, NFTs can be used to track digital property rights and cryptocurrency is used to fund platforms and reward users. This [article](#)²⁶ will dive into crypto's benefits, drawbacks, and uses in this climate, while answering the question: What is metaverse crypto? Also, be sure to read: what is the metaverse? for an intro to the metaverse." Source: Hedera

Top 7 Metaverse cryptocurrencies can be found [here](#)²⁷ .
You can find the 12 best Metaverse coins [here](#)²⁸ .

7.9 Interoperability

"Metaverse is taking us to a more immersive, augmented, and realistic digital world as it continues to blur the gap between our physical and the virtual world. Brands and enterprises actively seek ways to invest in the Metaverse and position their business into this virtual space to explore endless opportunities. However, some hurdles still create challenges for the Metaverse and impact its mass adoption.

²⁴ Shirin, Jennifer / Wenz, Daniel: Metaverse Coins 2023: 10 NFT projects with potential (April 24, 2023), URL: <https://bitcoin-2go.de/wiki/die-besten-metaverse-coins-2023/>, (Retrieved 12/31/2023, 22:55 UTC)

²⁵ Ashmore, Dan: 7 Top Metaverse Coins (December 1, 2023 11:21), URL: <https://www.forbes.com/advisor/investing/cryptocurrency/top-metaverse-coins/>, (Retrieved 12/31/2023, 23:502 UTC)

²⁶ Hedera: What is the Metaverse Crypto and how is it used, URL: <https://hedera.com/learning/metaverse/metaverse-crypto>, (Retrieved May 31, 2024, 17:33 UTC)

²⁷ Today Digital Inc: Top 7 Metaverse Cryptocurrencies (May 10, 2022), URL: <https://www.xrtoday.com/mixed-reality/top-7-metaverse-cryptocurrencies/>, (Retrieved 12/31/2023, 23:13 UTC)

²⁸ Majithia, Yash: 9 Best Metaverse Crypto Projects to invest in 2023 (December 13, 2023), URL: <https://www.techopedia.com/cryptocurrency/best-metaverse-coins>, (Retrieved 12/31/2023, 23:18 UTC)

Lack of [interoperability](#)²⁹ is one of the major hurdles. It restricts users' access in the Metaverse, limiting their navigation to a specific project instead of allowing them to navigate freely across multiple virtual worlds integrated within the 3D horizon of Metaverse. Since the Metaverse depicts the real world, the sense of commonness and interoperability that we experience in our real world is equally important even when we dwell on the virtual space.

People in the real world can visit different places worldwide and take their physical assets from one place to another without any trouble. Users inside a Metaverse project seek the same interoperability and continuity. Their purpose of participating in the realm of the Metaverse is to experience a close-to-reality digital space with various interconnected virtual worlds where users can seamlessly switch any project and leverage the benefits.

Interoperability brings all these perceptions to reality and forms a globally interconnected Metaverse system in which diverse projects are integrated to form a rich and real digital world. Let's dive deeper to understand the importance of interoperability in the Metaverse." Source: LeewayHertz

"The [Metaverse Standards Forum](#)³⁰ is now an independent, non-profit industry consortium

Less than a year after its initial launch, the Metaverse Standards Forum™ announced that it is now incorporated as an independent, non-profit industry consortium. The Forum's mission remains unchanged: to enable, promote and foster collaboration and coordination on Metaverse-related interoperability between standards organizations, companies and universities.

In June 2022, the Forum was launched and operated by the Khronos® Group. Today, with over 2,400 members and several active working and exploratory groups focused on driving pragmatic advances in interoperability, the Metaverse Standards Forum has organized its own governance, finances and operations. Working group activities remain freely accessible to any member, while new paid membership levels allow members to be elected to leadership positions in the forum while funding forum projects." Source: Metamandrill - immersive technology

You can find the Industrial Metaverse [here](#)³¹.

²⁹ Takyar, Akash: INTEROPERABILITY AND THE FUTURE OF THE METAVERSE, URL: <https://www.leewayhertz.com/metaverse-interoperability/>, (Retrieved 05/01/2024, 21:17 UTC)

³⁰ Metaverse Standards Forum: URL: <https://metamandrill.com/de/metaverse-standards-forum-incorporates/>, (Retrieved 05/01/2024, 21:55 UTC)

³¹ Industrial Metaverse (April 2023) URL: https://www.plattform-i40.de/IP/Redaktion/DE/Downloads/Publikation/Industrial_Metaverse.pdf?__blob=publicationFile&v=5, (Retrieved 05/01/2024, 22:04 UTC)

Metaverse Insider can be found [here](#)³².

8 Metaverse - Technology

There are web browsers for today's internet, such as Google Chrome, Firefox, Safari and Microsoft Edge. These tools allow the user to navigate the internet (World Wide Web). HTML (Hypertext Markup Language) plays a key role in this. I refer to this technology as Internet 2D. What does the three-dimensional Internet of the future look like? My idea is this: the 2D web browser is extended by a VRML component. The VRML component is specified by the World Wide Web Consortium ([W3C](#)³³) and made available as open source technology. See also [here](#)³⁴.

"[The Web3D consortium](#):³⁵ Web3D is a nonprofit organization that develops and maintains the X3D, VRML, and HAnim international standards. These are 3D graphics file formats and run-time specifications for the delivery and integration of interactive 3D data over networks. Web3D Consortium members work together to produce open, royalty-free and ISO-ratified capabilities for the Web." Source: web3d.org

"[X3D](#)³⁶ X3D has a rich set of componentized features that can be tailored for use in engineering and scientific visualization, CAD and architecture, Geospatial, Human animation, 3D printing and 3D Scanning, AR/MR/VR. Today X3D has several applications in medical visualization, training and simulation, multimedia, entertainment, education, and more. The latest [X3D® version 4](#)³⁷ The X3D® version 4 (X3D4) Architecture Specification is a major upgrade to the Extensible 3D (X3D) Graphics International Standard that provides close support for the HTML5 Recommendation, Khronos glTF Physically Based Rendering (PBR), Web Audio API, and MIDI 2.0, along with numerous other features. Humanoid Animation 2.0 (HAnim2) is also fully supported, including BVH-style motion animation. Functionally identical copies are published by ISO and Web3D Consortium under each organization's respective copyright. This mature specification is a major update building on prior versions of X3D and Virtual Reality Modeling Language (VRML). This effort is driven by the X3D Graphics

³² Metaverse Insider (January 2024) URL: <https://metaverseinsider.tech/>, (Retrieved 05:January 2024, 22:12 UTC)

³³ Making the Web work (2024) URL: <https://www.w3.org/>, (Retrieved 05/01/2024 22:18 UTC)

³⁴ Havele, Anita: The Keys to an Open, Interoperable Metaverse (25.05.2022), URL: <https://www.web3d.org/blog/anitahavele/keys-open-interoperable-metaverse>, (Retrieved 05/01/2024 22:27 UTC)

³⁵ Web 3D Consortium - Open Standards for Real-Time Communication (2024), URL: <http://www.web3d.org/>, (Retrieved 05/01/2024 22:33 UTC)

³⁶ What is X3D? (2024) URL: <https://www.web3d.org/x3d/what-x3d>, (Retrieved 02/03/2024 21:16 UTC)

³⁷ Extensible 3D (X3D) Part 1: Architecture and base components (2022) URL: <https://www.web3d.org/specifications/X3Dv4Draft/ISO-IEC19775-1v4-CD1/Part01/Architecture.html>, (Retrieved 02/03/2024 21:20 UTC)

Working Group with many contributions from multiple working groups and daily community outreach. Additional assets include ISO Publication (with public-access zip) and Web3D Consortium. [X3D4](#)³⁸ version 4.0 specification is now ratified by ISO/IEC as an International Standard. This latest version continues the tradition of interoperability, long-term stability, and royalty-free use while providing powerful new graphics and multimedia capabilities. The Web3D Consortium's X3D® version 4.0 standard spans a cross-platform ecosystem, including other standards such as glTF, HTML, MIDI, and Web Audio API for interactive, composable worlds on the Web. These APIs are specified in the ISO standard suite of [X3D](#)³⁹."

Source: web3d.org

³⁸ Web3D Consortium - X3D Version 4.0 Standard Overview, URL: <http://www.web3d.org/x3d4>, (Retrieved 04/18/2024 16:18 UTC)

³⁹ X3D Version 4.0 Standard Overview (2024) URL: https://www.web3d.org/sites/default/files/The%20Keys%20to%20an%20Open%2C%20Interoperable%20Metaverse_3.pdf, (Retrieved 02/03/2024 21:27 UTC)

9 Metaverse - Use cases

9.1 Shopping malls / Fashion

[*TheMall*](#)⁴⁰ is the future of interactive social shopping

"TheMall is the world's largest virtual mall. At 100 floors, the virtual tower is 100 million square feet of retail and entertainment space, TheMall aims to be the #1 destination in the Metaverse.

TheMall is built using the MetaVRse Engine, a web-based, low-code 3D creation platform with enterprise-grade integration protocols to assure guest safety and security. We've partnered with Hedera to deliver virtual NFTs representing virtual floors and parcels of TheMall. It comes undeveloped, but can be developed by MetaVRse Studio or other 3D creative teams using the low-code MetaVRse Engine." Source: The Mall

"The mall in the Metaverse - Dubai develops a virtual shopping center

*Dubai has partnered with Decentraland to develop its own [*mall*](#)⁴¹ in the metaverse: a virtual shopping center. The mall will appeal to visitors "seeking an enhanced digital experience across retail, entertainment and leisure," according to a recent announcement at the World Government Summit.*

The mall in the metaverse will represent the well-known shopping mall chain Majid Al Futtaim , albeit in the Web3 space. Once development is complete, several tests will be conducted before the mall is opened to virtual customers. Visitors will be able to visit the mall with their Web3 avatars and shop there, where they will find top brands such as Carrefour, Samsung Store , VOX Cinemas, Ghawali and THAT Concept Store. More exciting features will be added over time, including the number of brands accessible.

At the moment, the virtual mall is still in the early stages of development while the team behind the project assesses the desires and expectations of potential customers. According to Khalifa bin Braik, CEO of Majid Al Futtaim Asset Management, the mall will be the leading retail and entertainment destination. Therefore, he expects it to be a "major attraction for customers who crave digital experiences with their favorite brands" Source: The Meta Space

⁴⁰ The Mall - The world's largest virtual mall - shopping made social (2023), URL: <https://themall.io>, (Retrieved 02/03/2024, 21:34 UTC)

⁴¹ The Mall in the Metaverse - Dubai develops a virtual shopping center (2023), URL: <https://the-metaspace.com/die-mall-im-metaverse-dubai-entwickelt-ein-virtuelles-einkaufszentrum>, (Retrieved 02/03/2024, 21:40 UTC)

"[Worldline](#)⁴² opens shopping mall in the Metaverse - Consorsbank is part of it

Worldline wants to make it easy for retailers, banks and service providers to enter the metaverse and has been operating a new shopping mall in Decentraland since March 8. The first nine stores include Consorsbank, the Swiss luxury hotel The Chedi Andermatt and Naked Life, an Australian producer of non-alcoholic spirits. The white-label solution is aimed at all companies that are developing a metaverse strategy and are looking for a cost-effective way to get started.

In the Worldline Shopping Mall, retailers, service providers and banks can set up a modular presence in Web 3.0 to test how their own community reacts and how the potential of the metaverse can be tapped. The starter package offers store tenants the payment function with or without cryptocurrencies as well as a set of advertising services. Optional additional packages - including target advertising, phygital products and augmented reality - are designed to help stores and products gain more visibility and create an innovative customer experience. The decision to open a shopping mall in the Metaverse was preceded by a one-year test run.

"We are delighted to be one of the first banks in Europe to open a location in the Worldline Mall in the Metaverse. As a pioneer in digital direct banking in Germany, it is our aspiration to be curious and take innovative paths in contact with our customers and to adapt and try out modern technologies at an early stage. It is therefore a logical step to be present in the Metaverse together with Worldline as a technology provider," says Svenja Weith, Head of Tribe Banking at Consorsbank." Source: Worldline

9.2 Conducting meetings in 3D

"[Regus](#)⁴³ : Metaverse technology is poised to take remote and hybrid working to the next level. With companies like the aptly named Meta investing \$10 billion in its metaverse last year, it's clear the technology is set to play a key role in the coming years. But what will work really feel like in the metaverse? And what opportunities will this new immersive technology bring?" Source: Regus

"Rooom ⁴⁴ helps companies to take their daily work with digital and immersive content to a new level. The all-in-one platform for creating, managing and sharing impressive 3D, AR and VR experiences opens up completely new possibilities for various areas. These include

⁴² Worldline opens shopping mall in the Metaverse - Consorsbank is part of it (2023), URL: <https://www.kreditwesens.de/cards/ergaenzende-informationen/karten-meldungen/worldline-eroeffnet-shopping-mall-metaverse-consor-id86612.html>, (Retrieved 02/03/2024, 21:50 UTC)

⁴³ How Metaverse Technology can boost hybrid working (August 10, 2022), URL: <https://www.regus.com/en-gb/hybrid-working/how-metaverse-technology-can-boost-hybrid-working>, (Retrieved 02/03/2024, 22:20 UTC)

⁴⁴ Why room? URL: <https://www.rooom.com/de/>, (Retrieved 05/31/2024, 18:26 UTC)

marketing, sales, education, collaboration, events and entertainment. We specialize in enterprise metaverse solutions, digital showrooms, 3D product presentations and virtual events." Source: rooom

9.3 Concerts and events

"If the Metaverse already has nearly everything the real world has—clothing, grocery shopping, landlords—it makes sense that music will figure into its future too. While the technology is still in its relative infancy, there are already major artists who have performed in the Metaverse and begun venturing into the great digital unknown. With tours halted and the world sheltering in place in the spring of 2020, the Metaverse became an increasingly attractive option for artists who were looking for unconventional ways to connect with their audience. But still, even with artists back on the road, [Metaverse concerts](#)⁴⁵ are here to stay. Here are 12 artists who have performed in the Metaverse and brought the future of music into the present." Source: ONE37 PM

"A [virtual concert](#)⁴⁶ is a performance that takes place in the metaverse or a virtual world in which a virtual avatar's likeness is projected onto a virtual stage within virtual reality, synced to pre-recorded music. It's a way for fans to experience their favorite musicians in a new and exciting way, especially under the impact of covid, this seems like a new development.

In the Metaverse, virtual humans are no longer bound by physical limitations. An artist can quickly change outfits in a virtual concert or create a new stage by changing the environment in the virtual world. With more people venturing into the Metaverse and more virtual pop stars entering our world, the lines between reality and virtuality become increasingly blurred each day." Source: Event X

"According to Morning Consult, 45 percent of the public said they were interested in attending a [virtual concert](#)⁴⁷. 61 percent of late millennials and Gen Zers would be interested in attending a metaverse concert and having a digital avatar represent them. Such statistics show that interest in virtual concerts is definitely increasing. Here are the metaverses that make it possible." Source: Hypebot.com

⁴⁵ Tien-Dana, Jack: 12 Major Artists Who Have Performed in the Metaverse (June 5, 2023), URL: <https://www.one37pm.com/music/ten-major-artists-who-have-performed-in-the-metaverse>, (Retrieved 02/08/2024 22:16 UTC)

⁴⁶ Chen, Harry: Virtual Concert In The Metaverse: The Future of the Musical Industry (June 20, 2022) URL: <https://www.eventx.io/blog/virtual-concert-in-the-metaverse-the-future-of-the-musical-industry> (Retrieved 02/08/2024 22:24 UTC)

⁴⁷ Borg, Janelle: 5 metaverse concert platforms you need to pay attention to, URL: <https://www.hypebot.com/hypebot/2022/07/5-metaverse-concert-platforms-you-need-to-pay-attention-to.html> (Retrieved 02/08/2024 22:29 UTC)

"The metaverse is a massive trend at the moment, with news and promises about the power of the metaverse splashed across social media and all the biggest media headlines. The metaverse is the next evolution of the internet, where you can use technology like augmented and virtual reality to immerse yourself in a vibrant digital world.

Curious about how entertainment like music, theme parks, video games, and movies are incorporating immersive technology and living up to the promise of the metaverse?

[Here](#)⁴⁸ are some of the biggest examples of how the metaverse is already shaking up the entertainment world." Source: Forbes

"[Concerts](#)⁴⁹ taking place within the Metaverse are the next step in the evolution of the music industry. The coronavirus forced many artists to play virtual concerts in lieu of their live on-stage performances in 2020. While this may seem like a new development, virtual pop stars like Hatsune Miku have been selling out both offline and online concert venues for years. Virtual artists' human counterparts are only just beginning to understand the untapped potential of virtual concerts.

In the Metaverse, virtual humans are no longer bound by physical limitations. An artist can instantly change outfits in a virtual concert or transform the stage from an outer space realm to an underwater world. As more humans enter the Metaverse and more virtual pop stars enter our world, the lines between physical and virtual reality become increasingly blurred each day.

Today we uncover how both human and virtual music artists are changing the music industry with virtual concerts. Let's start with the basics first." Source: Virtual Humans

"[Concerts](#)⁵⁰ in Metaverse, however, seem to be the latest fad. Not only is it the next big building block in the Metaverse, but it is also the next step in the evolution of the virtual music industry. Even though we have seen a plethora of artists conducting their business and holding virtual shows on the internet, they were largely answerable to human limitations.

In the Metaverse, the leather jacket can instantly turn into a peacock-feathered tutu skirt. This is not a commentary or what-to-expect manual on Metaverse fashion, but the range of possibilities open to the virtual concerts.

⁴⁸ Marr, Bernard: The World Of Metaverse Entertainment: Concerts, Theme Parks, And Movies (July 27, 2022), Forbes, URL: <https://www.forbes.com/sites/bernardmarr/2022/07/27/the-world-of-metaverse-entertainment-concerts-theme-parks-and-movies/?sh=154074bc6531>, (Retrieved 02/08/2024 22:34 UTC)

⁴⁹ Rasmussen, Makena: Touring The Musical Metaverse: Virtual Concerts are Here to Stay (September 7, 2021) Virtual Humans: URL: <https://www.virtualhumans.org/article/touring-the-musical-metaverse-virtual-concerts-are-here-to-stay>, (Retrieved 02/08/2024 22:49 UTC)

⁵⁰ Concerts in Metaverse are Popping Up! URL: <https://blogs.airdropalert.com/concerts-in-metaverse-are-popping-up/>, (Retrieved 02/08/2024 22:53 UTC)

But concerts in Metaverse were proven publicly and unquestionably possible with Travis Scott's concert in the Fortune Videogame space. Over 2 million people in their avatars showed up for the concert.

The show was reportedly spectacular, with Travis' avatar roofing over the audience in the size of a skyscraper and interacting so directly with the audience that it quickly stopped being just virtual reality and became as real as could be.

There was something very futuristic about Travis Scott's concert in Metaverse, primarily due to the element of mobility. He moved around the space, occupying his entire space on the Metaverse forcing people to snap out of the idea that these concerts are merely experimentation of a futuristic concept." Source: Airdrop Alert

"In recent years, significant global events have tilted the events industry. The covid 19 pandemic implicated an unprecedented need for events to be experienced from home safety. Artists have pivoted at break-neck speed to be able to provide virtual acts and global clients have embraced [virtual entertainment](#)⁵¹ in a way never seen before." Source: ScarlettEntertainment.com

9.4 Support for medical operations

" The recent announcement of Facebook's rebranding to Meta took the internet by storm, making everyone curious about the Virtual Reality-based metaverse and its impact on our lives. However, it's important to know that Facebook is just one amongst hundreds of key players who have contributed to making the metaverse a reality. Today, many people are unaware of how the metaverse can revolutionize multiple industries, including the healthcare sector. The foundational technology of the metaverse, Virtual Reality (VR), has shown promising results in its [healthcare](#) applications⁵² ." Source: eLearningIndustry.com

" If you haven't yet learned about the metaverse, it's time to take note. The metaverse is about to explode and could be an \$800B market by 2024[1]. This next evolution of the internet is taking hold across industries, and healthcare is no exception. In fact, some are calling it the mediverse, as its promise for healthcare is transformational.

Let's be clear, it is not a gaming solution or a pair of virtual reality glasses. The metaverse enables us to move beyond browsing to participating and/or inhabiting a shared experience that spans the spectrum of our real world to a fully virtual world—and in between. When we

⁵¹ Victoria Helen: How The Metaverse Will Impact Live Entertainment (August 25, 2022) - Scarlett Entertainment, URL: <https://scarlettentertainment.com/blog/how-the-metaverse-will-impact-live-entertainment>, (Retrieved 02/08/2024 23:01 UTC)

⁵² Khan, Omaid: How Will The Metaverse Drastically Transform The Healthcare Industry? (June 8, 2022) eLearning Industry, URL: <https://elearningindustry.com/how-will-the-metaverse-drastically-transform-the-healthcare-industry>, (Retrieved 08/02/2024 23:04 UTC)

consider its effects, they are and will continue to be far-reaching, dramatically influencing [healthcare](#)⁵³ access, experiences and outcomes.” Source: accenture

“It’s happening without a lot of attention or fanfare, but the metaverse is spurring a transformation in [healthcare](#)⁵⁴. Innovative companies backed by substantial funding are achieving a rare trifecta—increased access, better outcomes, and lower costs—in areas such as medical and surgical imaging, mental health, and medical training.

Even though the metaverse is still in its early stages of development, most areas of health care are already experiencing its impact. Rapidly advancing technology and increasing adoption suggest significant disruption to come. Providers and payers need to determine now how they will engage with these developments. They should start with an understanding of the range of use cases already in the market, as well as those under development, and then define their vision for how these next-generation technologies can benefit them and their patients. On that foundation, they can decide where to invest strategically and how to prioritize their own use case development so they can evolve with the market rather than follow it.” Source: Boston Consulting Group

⁵³ Want to improve healthcare? Step into the metaverse (November 14, 2022) Accenture, URL: <https://www.accenture.com/us-en/blogs/insight-driven-health/healthcare-in-the-metaverse>, (Retrieved 02/08/2024 23:08 UTC)

⁵⁴ Adigozel, Ozgur / Mérey, Tibor / Mathews, Madeline: The Health Care Metaverse Is More Than a Virtual Reality (January 19, 2023), Boston Consulting Group, URL: <https://www.bcg.com/publications/2023/reaping-the-benefits-of-the-healthcare-metaverse>, (Retrieved 02/08/2024 23:18 UTC)

"Metaverse involves the convergence of three major technological trends, which all have the potential to impact healthcare individually. Together, though, they could create entirely new channels for delivering care that have the potential to lower costs and vastly improve [patient outcomes](#)⁵⁵. These are telepresence (allowing people to be together virtually, even while we're apart physically), digital twinning, and blockchain (and its ability to let us create a distributed internet)." Source: Forbes

"Already, there are several ways in which the [metaverse can be used in healthcare](#)⁵⁶, including training, surgical procedures, patient experience and digital twins. Let's take a look at two areas that could be the most widespread: training and digital twins.

Combined, the emergence and adoption of virtual reality (VR) in medical education, augmented reality (AR) in surgery and the wide adoption of cloud gaming technology could enable healthcare professionals and students to train wherever they are in the world. They could practice procedures together or with a virtual patient. Medical students in remote parts of the world could share the same virtual training facilities as students at the most prestigious medical schools and teaching hospitals.

The benefits of training through the metaverse include simulations with a much higher resolution of the human anatomy, greater levels of complexity for procedures and opportunities for seamless collaboration between centers of excellence, bringing the possibility of developing new groundbreaking surgical procedures on photo realistic models of real patients.

Even the way we conduct research and test new devices at Emergo by UL could change. For example, one day the metaverse could connect us with hard-to-reach patient groups. It could allow us to see how a participant uses a device in a multitude of settings, environments and scenarios within a single test session.

This brings us to digital twins. Your digital twin is not simply your metaverse avatar, but an accurate digital representation of your health based on all the existing data and new data as it becomes available. In medicine, digital twins could present huge amounts of patient scan data (e.g., MRI, CT, ultrasound scans) taken over time and displayed into one view. Not only could this show an accurate digital version of a patient, but through the use of historical scans, this could show how the patient's physiology has changed over time. In many cases, prototypes and replicas of the human body, hospital systems or entire hospitals are already in use. Babylon Health has already released a digital twin that uses data collected from

⁵⁵ Marr, Bernard: The Amazing Possibilities Of Healthcare In The Metaverse (February 23, 2022) Forbes, URL: <https://www.forbes.com/sites/bernardmarr/2022/02/23/the-amazing-possibilities-of-healthcare-in-the-metaverse/?sh=30d39e209e5c>, (Retrieved 02/08/2024 23:22 UTC)

⁵⁶ The Future of Healthcare in the Metaverse (December 14, 2022), URL: <https://www.emergobyul.com/news/future-healthcare-metaverse>, (Retrieved 02/08/2024 23:30 UTC)

wearables, in-app assessments and health records to help you understand your current health state and how it might change in the future.

In the future, a doctor may meet a patient for a routine check-up within the metaverse using a digital twin to demonstrate how a procedure will be carried out, or to visualize the impact their lifestyle choices could have on the health of their body.

What's next, and when will I be able to visit a "metaverse hospital?"

While its widespread adoption and impact is anticipated, we're still a while away from the metaverse's all-pervasive, glittering virtual reality. There are still hurdles to be overcome to consolidate multiple technologies into one seamless world. While that happens, here are a few opportunities to start considering:

Gimmick or meaningful experience? Consider how metaverse features could be implemented in a way that benefits the user and improves patient outcomes. Ask what you want to achieve from the metaverse and how it could be used to solve current problems.

Consider how the metaverse will integrate with existing systems within healthcare and plan services so they complement one another and do not become a battle of competing worlds and systems users must now manage independently." Source: emergobyul.com

"The metaverse, a collective virtual space that encompasses digital and augmented realities, is transforming industries, including [healthcare](#)⁵⁷. In this blog post, we'll explore 15 ways the metaverse is revolutionizing healthcare by enhancing the patient experience, streamlining medical procedures, and driving innovations. We'll also delve into real-world examples and discuss their impact." Source: capsule sight

⁵⁷ 15 Examples of the Use of Metaverse in Healthcare (May 1, 2023), URL: <https://capsulesight.com/metaverse/15-examples-of-the-use-of-metaverse-in-healthcare/>, (Retrieved 02/08/2024 23:33 UTC)

9.5 Role-playing games with avatars

9.5.1 Roblox

"[Roblox](#)⁵⁸ is an online game platform and game creation system developed by Roblox Corporation that allows users to program and play games created by themselves or other users. Created by David Baszucki and Erik Cassel in 2004 and released in 2006, the platform hosts user-created games of multiple genres coded in the programming language Lua. For most of Roblox's history, it was relatively small, both as a platform and as a company. Roblox began to grow rapidly in the second half of the 2010s, and this growth has been accelerated by the COVID-19 pandemic.

Roblox is free to play, with in-game purchases available through a virtual currency called Robux. As of August 2020, Roblox had over 164 million monthly active users, including more than half of all American children under 16. Although Roblox has received generally positive reviews from critics, it has faced criticism for its moderation, microtransactions, and allegations of exploitative practices toward children." Source: Wikipedia

9.5.2 Minecraft

"[Minecraft](#)⁵⁹ is a 2011 sandbox game developed by Mojang Studios and originally released in 2009. The game was created by Markus "Notch" Persson in the Java programming language. Following several early private testing versions, it was first made public in May 2009 before being fully released on November 18, 2011, with Notch stepping down and Jens "Jeb" Bergensten taking over development. Minecraft has become the best-selling video game in history, with over 300 million copies sold and nearly 140 million monthly active players as of 2023. Over the years following its release, it has been ported to several platforms, including PC, mobile and various consoles.

In Minecraft, players explore a blocky, pixelated, procedurally generated, three-dimensional world with virtually infinite terrain. Players can discover and extract raw materials, craft tools and items, and build structures, earthworks, and machines. Depending on their chosen game mode, players can fight hostile mobs, as well as cooperate with or compete against other players in the same world. Game modes include a survival mode (in which players must acquire resources to build in the world and maintain health), creative mode (in which players have unlimited resources and the ability to fly), spectator mode (in which players can fly, go through blocks, and enter the bodies of other players and entities), adventure mode (in which players have to survive without being able to build and place blocks), and hardcore mode (in which the difficulty is set to Hard and dying causes the player to lose their ability to play on that world). The game's large community also offers a wide variety of user-generated content,

⁵⁸ Page "Roblox". In: Wikipedia. The free encyclopedia. Edit status: February 7, 2024, 16:59 UTC, URL: <https://en.wikipedia.org/wiki/Roblox>, (Retrieved 02/08/2024 23:43 UTC)

⁵⁹ Page "Minecraft" In: Wikipedia. The free encyclopedia. Edit status: February 5, 2024, 18:32 UTC, URL: <https://en.wikipedia.org/wiki/Minecraft>, (Retrieved 02/08/2024 23:47 UTC)

such as modifications, servers, skins, texture packs, and custom maps, which add new game mechanics and possibilities.

Minecraft has received critical acclaim, winning several awards and being cited by some as one of the greatest video games ever created; social media, parodies, adaptations, merchandise, and the annual Minecon conventions played prominent roles in popularizing the game. The game has also been used in educational environments to teach chemistry, computer-aided design, and computer science. In 2014, Mojang and the Minecraft intellectual property were purchased by Microsoft for US\$2.5 billion. Several spin-offs have also been made, including Minicraft, Minecraft: Story Mode, Minecraft Earth, Minecraft Dungeons, and Minecraft Legends." Source: Wikipedia

9.5.3 World of Warcraft

"[World of Warcraft](#)⁶⁰ (WoW) is a massively multiplayer online role-playing game (MMORPG) released in 2004 by Blizzard Entertainment. Set in the Warcraft fantasy universe, World of Warcraft takes place within the world of Azeroth, approximately four years after the events of the previous game in the series, Warcraft III: The Frozen Throne. The game was announced in 2001, and was released for the 10th anniversary of the Warcraft franchise on November 23, 2004. Since launch, World of Warcraft has had nine major expansion packs: The Burning Crusade (2007), Wrath of the Lich King (2008), Cataclysm (2010), Mists of Pandaria (2012), Warlords of Draenor (2014), Legion (2016), Battle for Azeroth (2018), Shadowlands (2020), and Dragonflight (2022). Three further expansions, The War Within (planned for 2024), Midnight, and The Last Titan, were announced in 2023.

Similar to other MMORPGs, the game allows players to create a character avatar and explore an open game world in third- or first-person view, exploring the landscape, fighting various monsters, completing quests, and interacting with non-player characters (NPCs) or other players. The game encourages players to work together to complete quests, enter dungeons and engage in player versus player (PvP) combat, however, the game can also be played solo without interacting with others. The game primarily focuses on character progression, in which players earn experience points to level up their character to make them more powerful and buy and sell items using in-game currency to acquire better equipment, among other game systems.

World of Warcraft was a major critical and commercial success upon its original release in 2004 and quickly became the most popular MMORPG of all time, reaching a peak of 12 million subscribers in 2010. The game had over one hundred million registered accounts by 2014 and by 2017, had grossed over \$9.23 billion in revenue, making it one of the highest-grossing video game franchises of all time. The game has been cited by gaming journalists as the greatest MMORPG of all time and one of the greatest video games of all time and has also been noted for its long lifespan, continuing to receive developer support and expansion

⁶⁰ Page "World of Warcraft" In: Wikipedia. The free encyclopedia. Edit status: 30 January 2024, 17:18 UTC, URL: https://en.wikipedia.org/wiki/World_of_Warcraft, (Retrieved 02/10/2024 20:46 UTC)

packs over 15 years since its initial release. In 2019, a vanilla version of the game titled *World of Warcraft Classic* was launched, allowing players to experience the base game before any of its expansions launched, with versions of *Classic* for future expansions being released subsequently, with minor changes. In 2022, Blizzard and NetEase cancelled an unannounced *World of Warcraft* mobile spin-off game." Source: Wikipedia

9.5.4 Call of Duty

*"[Call of Duty](#)⁶¹ is a military video game series and media franchise published by Activision, starting in 2003. The games were first developed by Infinity Ward, then by Treyarch and Sledgehammer Games. Several spin-off and handheld games were made by other developers. The most recent title, *Call of Duty: Modern Warfare III*, was released on November 10, 2023. The upcoming title, *Call of Duty: Black Ops 6*, is scheduled to be released in October 2024.*

*The series originally focused on a World War II setting, with Infinity Ward developing *Call of Duty* (2003) and *Call of Duty 2* (2005) and Treyarch developing *Call of Duty 3* (2006). *Call of Duty 4: Modern Warfare* (2007) introduced a modern setting, and proved to be the breakthrough title for the series, creating the *Modern Warfare* sub-series; a *Modern Warfare* remastered version released in 2016. Two other entries, *Modern Warfare 2* (2009) and *Modern Warfare 3* (2011), were made. The sub-series received a reboot with *Modern Warfare* in 2019, *Modern Warfare II* in 2022, and *Modern Warfare III* in 2023. Infinity Ward have also developed two games outside of the *Modern Warfare* sub-series, *Ghosts* (2013) and *Infinite Warfare* (2016).*

*Treyarch made one last World War II-based game, *World at War* (2008), before releasing *Black Ops* (2010) and subsequently creating the *Black Ops* sub-series. Four other entries, *Black Ops II* (2012), *Black Ops III* (2015), *Black Ops 4* (2018), and *Cold War* (2020) were made, the latter in conjunction with Raven Software. Sledgehammer Games, who were co-developers for *Modern Warfare 3*, have also developed three titles, *Advanced Warfare* (2014), *Call of Duty: WWII* (2017), and *Vanguard* (2021). They are also the lead developer for *Modern Warfare III* (2023), the third entry in the *Modern Warfare* reboot sub-series.*

*As of October 2023, *Call of Duty* has sold over 425 million copies. The series is verified by the Guinness World Records as the best-selling first-person shooter game series. It is also the most successful video game franchise created in the United States and the fourth best-selling video game franchise of all time. Other products in the franchise include a line of action figures designed by Plan B Toys, a card game created by Upper Deck Company, Mega Bloks sets by Mega Brands, and a comic book miniseries published by WildStorm Productions,"*
Source: Wikipedia

⁶¹ Page "Call of Duty" In: Wikipedia. The free encyclopedia. Edit status: 9 February 2024, 00:04 UTC, [URL:https://en.wikipedia.org/wiki/Call_of_Duty](https://en.wikipedia.org/wiki/Call_of_Duty) (Retrieved 10/02/2024 20:48 UTC)

9.5.5 Legend of Zelda

"The [Legend of Zelda](#)⁶² is an action-adventure game franchise created by the Japanese game designers Shigeru Miyamoto and Takashi Tezuka. It is primarily developed and published by Nintendo, although some portable installments and re-releases have been outsourced to Flagship, Vanpool, and Grezzo. Its gameplay incorporates action-adventure and elements of action RPG games.

The series centers on the various incarnations of Link, a courageous young man of the elf-like Hylian race, and Princess Zelda, a magical princess within the bloodline of the goddess Hylia, as they fight to save the magical land of Hyrule from Ganon, an evil warlord turned demon king, who is the principal antagonist of the series. Ganon wishes to use the Triforce, a sacred relic left behind by the three goddesses that created Hyrule, to remake the world in his own dark image. When gathered together, the power of the Triforce can grant any wish its user desires; however, if someone with a heart that does not possess a balance of the three virtues of Power, Courage, and Wisdom attempts to touch the Triforce, it will split into three triangles and bond with three people whose hearts embody the required virtue.

Although their personalities and backstory differ from game to game, the incarnations of Link and Zelda often have many traits in common, such as Link often being left-handed and clad in green, and Zelda being associated with wisdom, light, and prophesy. While the conflict with Ganon serves as a backbone for the series, some games have featured other settings and antagonists, with Link traveling or being sent to these other lands in their time of need.

Since the original Legend of Zelda was released in 1986, the series has expanded to include 20 entries on all of Nintendo's major game consoles, as well as a number of spin-offs. An American animated TV series based on the games aired in 1989 and individual manga adaptations commissioned by Nintendo have been produced in Japan since 1997. The Legend of Zelda is one of Nintendo's most successful franchises; several of its entries are considered among the greatest video games of all time." Source: Wikipedia

⁶² Page "The Legend of Zelda" In: Wikipedia. The free encyclopedia. Edit status: 6 February 2024, 20:12 UTC, [URL:https://en.wikipedia.org/wiki/The_Legend_of_Zelda](https://en.wikipedia.org/wiki/The_Legend_of_Zelda), (Retrieved 10/02/2024 20:53 UTC)

9.5.6 Second Life

"[Second Life](#)⁶³ is an online video game that allows people to create an avatar for themselves and then interact with other users and user-created content within a multi-user online virtual world. Developed and owned by the San Francisco-based firm Linden Lab and launched on June 23, 2003, it saw rapid growth for some years and in 2013 it had approximately one million regular users. Growth eventually stabilized, and by the end of 2017 the active user count had declined to "between 800,000 and 900,000". In many ways, Second Life is similar to massively multiplayer online role-playing games; nevertheless, Linden Lab is emphatic that their creation is not a game: "There is no manufactured conflict, no set objective."

The virtual world can be accessed freely via Linden Lab's own client software or via alternative third-party viewers. Second Life users, also called 'residents', create virtual representations of themselves, called avatars, and are able to interact with places, objects and other avatars. They can explore the world (known as the grid), meet other residents, socialize, participate in both individual and group activities, build, create, shop, and trade virtual property and services with one another.

The platform principally features 3D-based user-generated content. Second Life also has its own virtual currency, the Linden Dollar (L\$), which is exchangeable with real world currency. Second Life is intended for people ages 16 and over, with the exception of 13–15-year-old users, who are restricted to the Second Life region of a sponsoring institution (e.g., a school)." Source: Wikipedia

9.5.7 Fortnite

"[Fortnite](#)⁶⁴ is an online video game and game platform developed by Epic Games and released in 2017. It is available in six distinct game mode versions that otherwise share the same general gameplay and game engine: Fortnite Battle Royale, a free-to-play battle royale game in which up to 100 players fight to be the last person standing; Fortnite: Save the World, a cooperative hybrid tower defense-shooter and survival game in which up to four players fight off zombie-like creatures and defend objects with traps and fortifications they can build; and Fortnite Creative, in which players are given complete freedom to create worlds and battle arenas, Lego Fortnite, an open world survival game, Rocket Racing, a racing game, and Fortnite Festival, a rhythm game.

⁶³ Page "Second Life" In: Wikipedia. The free encyclopedia. Edit status: 29 January 2024, 04:20 UTC, URL: https://en.wikipedia.org/wiki/Second_Life, (Retrieved on 02/10/2024 20:56 UTC)

⁶⁴Page "Fortnite" In: Wikipedia. The free encyclopedia. Edit status: 6 February 2024, 05:45 UTC, URL: <https://en.wikipedia.org/wiki/Fortnite>, (Retrieved 10/02/2024 21:00 UTC)

Save the World and Battle Royale were released in 2017 as early access titles, while Creative was released on December 6, 2018. While the Save the World and Creative versions have been successful for Epic Games, Fortnite Battle Royale in particular became an overwhelming success and a cultural phenomenon, drawing more than 125 million players in less than a year, earning hundreds of millions of dollars per month. Fortnite as a whole generated \$9 billion in gross revenue up until December 2019, and it has been listed among the greatest games of all time.

Save the World is available for macOS,[c] PlayStation 4, Windows, and Xbox One, while Battle Royale and Creative were released for all those platforms as well as Android and iOS devices[c] and Nintendo Switch. The game also launched with the release of the ninth-generation PlayStation 5 and Xbox Series X/S consoles. Furthermore, Lego Fortnite, Rocket Racing and Fortnite Festival are available on all platforms." Source: Wikipedia

9.6 Virtual offices

"Regus⁶⁵ recently commissioned the biggest survey yet of company leaders and office workers to gauge their views on working in the metaverse. Respondents were very enthusiastic, with 71% of business leaders saying that the metaverse will open up new opportunities, and 65% already considering it as part of the next step in the evolution of the virtual world and hybrid working." Source: Regus

9.7 Virtual Campus / Further education

9.7.1 ThinkML - How to build a virtual campus in the metaverse?

"Virtual reality is a trending topic, with organizations investing in virtual classrooms to accommodate students better. This article will cover the benefits of building a virtual building via the Metaverse, a popular online universe of thousands of designers, developers, educators and learners.

[Virtual campuses](#)⁶⁶ and educational experiences have been developed by institutions, corporations, and individual instructors on virtual worlds like Second Life for years. Virtual campuses have gained more attention and popularity as a result of COVID's contributions to the rapid development of online education and the widespread dissemination of "the metaverse" as a well-known term. In addition, we have reached a tipping point in terms of our global technical infrastructure, making it possible to employ virtual campuses to greatly

⁶⁵ Regus, How metaverse technology can promote hybrid working. August 10, 2022, URL: <https://www.regus.com/en-gb/hybrid-working/how-metaverse-technology-can-boost-hybrid-working> (Retrieved 5/31/2024 19:55 UTC)

⁶⁶ How to build a virtual campus in the metaverse? (November 22, 2022), URL: <https://thinkml.ai/how-to-build-a-virtual-campus-in-the-metaverse/>, (Retrieved 02/10/2024 21:13 UTC)

improve the educational experience and outcomes for students and teachers everywhere."
Source: ThinML.ai

9.7.2 Axon Park

"[Axon Park](#)⁶⁷ started in January 2019 with the mission to radically enhance education using new technology. We believe that interactive 3D virtual worlds, along with advanced AI, are unlocking a radically new paradigm in digital learning — A paradigm that will make digital education far more engaging, effective, and fun for students and educators worldwide."
Source: Axon Park

9.7.3 Times Higher Education

The [Metaversum](#)⁶⁸ is much more than a virtual copy of your campus.

⁶⁷ Build your virtual campus, URL: <https://axonpark.com/metaverse-campus/>, (Retrieved 02/11/2024 00:04 UTC)

⁶⁸ Miah, Andy: The Metaverse is much more than a virtual copy of your campus (June 15, 2022), URL: <https://www.timeshighereducation.com/campus/metaverse-much-more-virtual-copy-your-campus>, (Retrieved 02/11/2024 00:07 UTC)

9.7.4 Business School in the Metaverse

“Educators and business experts believe that the vision of a metaverse, built on fast-developing virtual technology and augmented reality, has the potential to transform business education. Consider a European [business school](#)⁶⁹ sending students on a tour of five factories across Asia, Europe, and the United States to interview managers and analyze day-to-day operational efficiencies and best practices—all experienced via virtual reality (VR) headsets, 3D videos, and avatars.

Or consider that by wearing VR headsets, 30 MBA students in the United States can visit the homes and follow the daily lives of four families in southwest India to assess consumer needs in the healthcare and wellness sector. In yet another example, French business school students attend classes from any country, not having to interrupt their core program work while they do international internships or conduct research abroad. Via a personalized avatar, students can access a fully virtual campus’s classrooms, social activities, and services 24/7.” Source: Harvard Business Publishing Education

9.8 Virtual worlds / cities (Westworld / Futureworld)

I recently watched the movies Westworld and Futureworld on Amazon Prime. What struck me was the fact that they are about worlds. When it comes to whether there are different metaverses, I answer: “There will be metaverse (virtual) worlds. Every game platform is a metaverse (virtual) world. Each of these “worlds” can be assigned to certain categories. Games, business, industrial, for example, can be these categories.

9.9 Car configurator

One use case for the automotive industry is the car configurator. Every automotive supplier would like to have this application on offer. There is a company in the Metaverse that takes on this task. This company offers the same service to all car manufacturers in the world. It develops special 3D models for different manufacturers using standardized software. I call this company Global Automobile Industries SE.

10 Metaverse - Gaming platform (Best of Breed)

There are a number of game platforms that are self-contained and not interchangeable. This means, for example, that avatars can only be used in one game platform. An exchange is not possible in most cases. Digital goods (NFTs) cannot be taken from one platform to another either. In my view, three areas need to be standardized. Firstly, the design and configuration of avatars. For this purpose, the implementation that is most widely used should be used. Since I don't know any

⁶⁹ Govindarajan, Vijay: Business School in the Metaverse: Part 1 (November 11, 2022), URL: <https://hbsp.harvard.edu/inspiring-minds/business-school-in-the-metaverse>, (Retrieved 02/11/2024 00:12 UTC)

better, I suggest adopting the avatar implementation of "World of Warcraft" as the standard. This implementation is based on a 3D VRML - Linux - technology that can be understood by all games and worlds. Secondly, the use of digital goods will also be standardized. The concepts that have proven themselves in the past will be adopted. Thirdly, there is a concept called the Metaverse wallet. Digital currencies and goods are collected in this digital wallet. The metaverse wallet is also standardized. This metaverse wallet can be used to pay (like Pay Pal) in all role-playing games. It is also possible to pay with the "electronic wallet" in shopping arcades. The Metaverse wallet is a stand-alone app that can be used to pay anywhere. The cryptocurrency Ethereum is used as a means of payment.

11 Metaverse - People

11.1 Matthew Ball (CEO of EpyllionCo)

Matthew Ball⁷⁰ was Global Head of Strategy at Amazon Studios from 2016 to 2018 and has written for the New York Times, The Economist and Bloomberg, among others. His self-published essays on the metaverse have been read millions of times and cited by executives at Epic Games, Facebook, Tencent and Coinbase.

11.2 Mark Zuckerberg (CEO of Meta / Facebook)

"[Mark Elliot Zuckerberg](#)⁷¹ (born May 14, 1984) is an American businessman. He co-founded the social media service Facebook, along with his Harvard roommates in 2004, and its parent company Meta Platforms (formerly Facebook, Inc.), of which he is chairman, chief executive officer and controlling shareholder.

Zuckerberg briefly attended Harvard University, where he launched Facebook in February 2004 with his roommates Eduardo Saverin, Andrew McCollum, Dustin Moskovitz and Chris Hughes. Zuckerberg took the company public in May 2012 with majority shares. In 2008, at age 23, he became the world's youngest self-made billionaire. He has since used his funds to organize multiple donations, including the establishment of the Chan Zuckerberg Initiative."
Source: Wikipedia

11.3 Jensen Huang (CEO of Nvidia)

"[Jen-Hsun "Jensen" Huang](#)⁷² (born 17 February 1963) is an American businessman, electrical engineer, and the co-founder, president and CEO of Nvidia. He co-founded Nvidia in 1993 at age 30 and in June 2024, it became the largest company in the world by market capitalization. As of June 2024, Forbes estimated Huang's net worth at \$115 billion, making him the 12th richest person in the world.

Huang was born in Tainan, Taiwan on February 17, 1963. His family moved to Thailand when he was five years old. When he was nine, he and his older brother were sent to the United States to live with an uncle in Tacoma, Washington. When he was ten, he lived in the boys' dormitory with his brother at Oneida Baptist Institute while attending a separate public

⁷⁰ Matthew Ball: The Metaverse - And how it will revolutionize everything (Verlag Franz Vahlen Munich, 2022)

⁷¹ Page "Mark Zuckerberg". In: Wikipedia. The free encyclopedia. Edit status: June 14, 2024 09:03 UTC, URL: https://en.wikipedia.org/wiki/Mark_Zuckerberg, (Retrieved 06/20/2024, 15:43 UTC)

⁷² Page "Jensen Huang". In: Wikipedia. The free encyclopedia. Edit status: February 8, 2024 19:26 UTC, URL: https://en.wikipedia.org/wiki/Jensen_Huang, (Retrieved 06/20/2024, 15:48 UTC)

school, Oneida Elementary school, in Oneida, Kentucky—his uncle had mistaken what was actually a religious reform academy for a prestigious boarding school." Source: Wikipedia

11.4 William Gibson (author of Neuromancer)

*"[William Ford Gibson](#)⁷³ (born March 17, 1948) is an American-Canadian speculative fiction writer and essayist widely credited with pioneering the science fiction subgenre known as cyberpunk. Beginning his writing career in the late 1970s, his early works were noir, near-future stories that explored the effects of technology, cybernetics, and computer networks on humans, a "combination of lowlife and high tech" — and helped to create an iconography for the information age before the ubiquity of the Internet in the 1990s. Gibson coined the term "cyberspace" for "widespread, interconnected digital technology" in his short story "Burning Chrome" (1982), and later popularized the concept in his acclaimed debut novel *Neuromancer* (1984). These early works of Gibson's have been credited with "renovating" science fiction literature in the 1980s." Source: Wikipedia*

11.5 Tim Sweeney (CEO and Co-Founder of Epic Games)

"[Timothy Dean Sweeney](#)⁷⁴ (born 1970) is an American video game programmer and businessman. He is the founder and CEO of Epic Games, and the creator of Unreal Engine, a game development platform..

Sweeney was raised in Potomac, Maryland, the youngest of three brothers. At a young age, he became interested in tinkering with mechanical and electrical devices, and stated he had taken apart a lawnmower as early as five or six, and later built his own go-kart. He became interested in arcade games when they began to become popular in the late 1970s, knowing that like the mechanics devices he took apart and repaired, there were those that had programmed the games in the machines. Though the family got an Atari 2600, Sweeney was not as interested in the games for that, outside of Adventure, and later said he had not played many video games in his life and very few to completion.

At the age of 11, Sweeney visited his older brother's new startup in California, where he had access to early IBM Personal Computers. Sweeney spent the week there, learning BASIC and establishing his interest in programming; while he had had a Commodore 64 before, Sweeney was much more taken by how easy the IBM PC was to use. When his family got an Apple II, Sweeney began in earnest learning how to program on that, trying to make Adventure 2 in the spirit of the Atari 2600 game. Sweeney estimated that between the ages of 11 and 15, he spent

⁷³ Page "William Gibson". In: Wikipedia. The free encyclopedia. Edit status: June 6, 2024 06:28 UTC, URL: https://en.wikipedia.org/wiki/William_Gibson (Retrieved 06/20/2024, 01:12 UTC)

⁷⁴ Page "Tim Sweeney". In: Wikipedia. The free encyclopedia. Edit status: March 18, 2024 00:40 UTC, URL: [https://en.wikipedia.org/wiki/Tim_Sweeney_\(game_developer\)](https://en.wikipedia.org/wiki/Tim_Sweeney_(game_developer)) (Retrieved 06/20/2024, 01:12 UTC)

over 10,000 hours teaching himself how to program using information on online bulletin boards, and completed several games, though never shared these with others. He also learned from his brothers concepts of entrepreneurship. As a teenager, he made a good deal of money by offering to mow lawns of wealthy residents in the area for half the price of professional services." Source: Wikipedia

11.6 Neal Stephenson (author of Snow Crash)

"[Neal Town Stephenson](#)⁷⁵ (born October 31, 1959) is an American writer known for his works of speculative fiction. His novels have been categorized as science fiction, historical fiction, cyberpunk and baroque.

Stephenson's work explores mathematics, cryptography, linguistics, philosophy, currency, and the history of science. He also writes non-fiction articles about technology in publications such as Wired. He has written novels with his uncle, George Jewsbury ("J. Frederick George"), under the collective pseudonym Stephen Bury.

Stephenson has worked part-time as an advisor for Blue Origin, a company (founded by Jeff Bezos) developing a spacecraft and a space launch system, and is also a cofounder of Subutai Corporation, whose first offering is the interactive fiction project The Mongoliad. He was Magic Leap's Chief Futurist from 2014 to 2020.

Stephenson's breakthrough came in 1992 with [Snow Crash](#), a cyberpunk or postcyberpunk novel fusing memetics, computer viruses, and other high-tech themes with Sumerian mythology, along with a sociological extrapolation of extreme laissez-faire capitalism and collectivism. Stephenson at this time would later be described by Mike Godwin as "a slight, unassuming grad-student type whose soft-spoken demeanor gave no obvious indication that he had written the manic apotheosis of cyberpunk science fiction." In 1994, Stephenson joined with his uncle, J. Frederick George, to publish a political thriller, Interface, under the pen name "Stephen Bury"; they followed this in 1996 with The Cobweb." Source: Wikipedia

11.7 John Riccitiello (CEO of Unity)

"[John Riccitiello](#)⁷⁶ is an American business executive. Previously, he was chief executive officer, chief operating officer and president of Unity Technologies, Electronic Arts, and co-founded private equity firm Elevation Partners in 2004. Riccitiello has sat on several company boards, including those of the Entertainment Software Association, the Entertainment Software Rating Board, the Haas School of Business and the USC School of Cinematic Arts.

John Riccitiello was born in Erie, Pennsylvania. He earned his Bachelor of Science degree from the University of California, Berkeley's Haas School of Business in 1981.

Early in his career, Riccitiello worked at Clorox and PepsiCo, and was managing director of the Häagen-Dazs division of Grand Metropolitan, during which time he spearheaded an

⁷⁵ Page "Neal Stephenson". In: Wikipedia. The free encyclopedia. Edited on June 17, 2024 23:57 UTC, URL: https://en.wikipedia.org/wiki/Neal_Stephenson, (Retrieved 06/20/2024, 01:28 UTC)

⁷⁶ Page "John Riccitiello". In: Wikipedia. The free encyclopedia. Edited on May 25 9, 2024 14:09 UTC, URL: https://en.wikipedia.org/wiki/John_Riccitiello, (Retrieved 06/20/2024, 01:38 UTC)

advertising campaign which successfully broke Häagen-Dazs into the European market. He was named president and chief executive officer (CEO) of Wilson Sporting Goods, as well as chairman of MacGregor Golf, in late 1993. He then was president and CEO of Sara Lee Corporation's Sara Lee Bakery Worldwide unit Riccitiello joined the video game company Electronic Arts (EA) in October 1997 and was initially President and Chief Operating Officer until 2004. He left the company to co-found Elevation Partners and serve as a partner. A private equity firm specializing in entertainment and media companies, along with Roger McNamee and Bono, Riccitiello returned to EA to serve as CEO from February 2007 to March 2013, when the board accepted his resignation due to the company's financial performance. After EA, he worked as a consultant for startup companies and became an early investor in Oculus VR.

Riccitiello became the CEO of Unity Technologies in late 2014, having previously consulted for and joined the technology company's board in November 2013. During his tenure, he has overseen two fundraising rounds, raising \$181 million in 2016 and \$400 million in 2017. He has also worked to get Unity's game engine into Oculus's software development kit. Riccitiello has led efforts to develop the use of Unity's software tools beyond gaming, in industries such as automotive design, construction, and filmmaking." Source: Wikipedia

11.8 Kenichiro Yoshida, (CEO of Sony)

"[Kenichiro Yoshida](#)⁷⁷ (born 20 October 1959) is a Japanese businessman who has been the chief executive officer of Sony[1] since April 2018,[2] succeeding Kazuo Hirai, prior to which Yoshida was the company's chief financial officer.

Yoshida was born in Kumamoto in 1959, where his father, a court judge, was posted at the time. Immediately after graduating from the University of Tokyo with a B.A. in economics in 1983, Yoshida joined Sony, and worked across the company's subsidiaries in the US and Japan.

In the year 2000, he worked for Sony subsidiary So-net, which he took public in 2005. He rejoined Sony in 2013 as deputy chief financial officer and was promoted to chief financial officer the following year.[1] In his role as CFO, he was credited with pushing the company through an extensive restructuring which turned around Sony's losses from consumer electronics." Source: Wikipedia

⁷⁷ Page "Kenichiro Yoshida". In: Wikipedia. The free encyclopedia. Edit status: June 16, 2024 04:00 UTC, URL: https://en.wikipedia.org/wiki/Kenichiro_Yoshida, (Retrieved 06/20/2024, 01:42 UTC)

11.9 Phil Spencer (CEO of Microsoft Gaming)

"[Phil Spencer](#)⁷⁸ (born January 12, 1968) is an American business executive and the CEO of Microsoft Gaming. Starting his career at Microsoft as an intern in 1988, Spencer has worked in various sectors within the company, including developing Microsoft's first CD-ROM-based titles. He joined the Xbox team in 2001.

Spencer joined Microsoft in 1988 as an intern and has worked in a number of technical roles, leading the development of Microsoft's first CD-ROM-based titles (such as Encarta), development manager for Microsoft Money, and general manager of Microsoft's online and offline consumer productivity products including Microsoft Works and Microsoft Picture It! During his early time at Microsoft, he was known by other employees to be an avid gamer, playing games such as Ultima Online in the office.

With the launch of the Xbox in 2001, Spencer joined the Xbox team and served as general manager of Microsoft Game Studios EMEA, working with Microsoft's European developers and studios such as Lionhead Studios and Rare until 2008, when he became the general manager of Microsoft Studios, eventually becoming the studio's corporate vice president a year later. He has participated in Microsoft's E3 conferences since 2010.

In late March 2014, Satya Nadella announced in a corporate e-mail that Spencer was to "lead the Xbox, Xbox Live, Groove Music and Movies & TV teams, and Microsoft Studios" as part of the Windows and Devices division.

In September 2017, Spencer was promoted to the Senior Leadership Team, gaining the title of Executive Vice President of Gaming and reporting directly to CEO Satya Nadella.

In 2018, Spencer delivered the keynote address at the 2018 DICE Summit and spoke at the 2018 Game Awards.

In January 2022, along with the announcement of Microsoft's intent to acquire Activision Blizzard, Spencer was promoted to the role of CEO of Microsoft Gaming.

Since taking over both Xbox and the Gaming division, Spencer has advocated for cross-platform play, as well as launched key initiatives, such as reintroducing backward compatibility to the Xbox platform, the purchase of Mojang and Bethesda, the further development and support of Minecraft, the introduction of Xbox Game Pass, launching the Xbox Adaptive Controller, an increased focus on PC gaming, porting some Microsoft published games to other platforms including the Nintendo Switch, the launch of xCloud, and increasing the number of first-party development studios.

⁷⁸ Page "Phil Spencer (business executive)". In: Wikipedia. The free encyclopedia. Edit status: June 12, 2024 10:39 UTC, URL: [https://en.wikipedia.org/wiki/Phil_Spencer_\(business_executive\)](https://en.wikipedia.org/wiki/Phil_Spencer_(business_executive)) (Retrieved 06/20/2024, 01:57 UTC)

Spencer received the Lifetime Achievement award at the 25th Annual D.I.C.E. Awards on February 24, 2022, and the Andrew Yoon Legend award at the New York Game Awards on January 17, 2023. Source: Wikipedia

11.10 Geoffrey Hinton

"[Geoffrey E. Hinton](#)⁷⁹, (born 6 December 1947) is a British-Canadian computer scientist and cognitive psychologist, most noted for his work on artificial neural networks. From 2013 to 2023, he divided his time working for Google (Google Brain) and the University of Toronto, before publicly announcing his departure from Google in May 2023, citing concerns about the risks of artificial intelligence (AI) technology. In 2017, he co-founded and became the chief scientific advisor of the Vector Institute in Toronto.

With David Rumelhart and Ronald J. Williams, Hinton was co-author of a highly cited paper published in 1986 that popularized the backpropagation algorithm for training multi-layer neural networks, although they were not the first to propose the approach. Hinton is viewed as a leading figure in the deep learning community. The dramatic image-recognition milestone of the AlexNet designed in collaboration with his students Alex Krizhevsky and Ilya Sutskever for the ImageNet challenge 2012 was a breakthrough in the field of computer vision.

Hinton received the 2018 Turing Award, often referred to as the "Nobel Prize of Computing", together with Yoshua Bengio and Yann LeCun, for their work on deep learning. They are sometimes referred to as the "Godfathers of Deep Learning", and have continued to give public talks together.

In May 2023, Hinton announced his resignation from Google to be able to "freely speak out about the risks of A.I." He has voiced concerns about deliberate misuse by malicious actors, technological unemployment, and existential risk from artificial general intelligence. He noted that establishing safety guidelines will require cooperation among those competing in use of AI in order to avoid the worst outcomes.

He holds a Canada Research Chair in Machine Learning and is currently an advisor for the Learning in Machines & Brains program at the Canadian Institute for Advanced Research. Hinton taught a free online course on Neural Networks on the education platform Coursera in 2012. He joined Google in March 2013 when his company, DNNresearch Inc., was acquired, and was at that time planning to "divide his time between his university research and his work at Google." Source: Wikipedia

⁷⁹ Page "Geoffrey Hinton". In: Wikipedia. The free encyclopedia. Edited on June 19, 2024 22:49 UTC, URL: https://en.wikipedia.org/wiki/Geoffrey_Hinton, (Retrieved 06/20/2024, 01:59 UTC)

12 Metaverse and geopolitics

A prerequisite for the positive, global development of the metaverse is the peaceful coexistence of all peoples on planet Earth. Decisive for the future of the metaverse is the relationship between the USA and the countries of Russia and China. A confrontation between the USA and China and/or Russia is entirely possible. The conflicts between these states can be fought out in real life, in space and in the metaverse.

In the event of peaceful coexistence, I see a metaverse alliance that - like the UN - encompasses all states on planet Earth. This body has the task of adopting global standards, laws and guidelines that are binding for all countries on planet Earth. If standards, laws and guidelines are to be issued or amended, the "Big 6" must agree. These are:

- USA / Canada / United Kingdom / Australia / New Zealand - Metaverse Alliance (five eyes)
- [European Union](#) - Metaverse Alliance
- Russia - Metaverse Alliance
- China - Metaverse Alliance ([Tencent](#))⁸⁰
- South Korea - Metaverse Alliance
- Japan - Metaverse Alliance

In addition, each country can issue individual laws and guidelines. In the Metaverse, there will be guardians who ensure compliance with global standards, laws and guidelines and protect the network from trolls.

In mid-2021, the South Korean Metaverse Alliance was founded by the South Korean Ministry of Science and ICT and comprises more than 450 domestic companies⁸¹.

Japan has a large share of the global games market with the Sony Playstation⁸²

A metaverse alliance is established for each of the countries (alliances) listed above.

⁸⁰ Page "Tencent" In: Wikipedia. The free encyclopedia. Edit status: April 19, 2024, 12:03 UTC, <https://en.wikipedia.org/wiki/Tencent>, (Retrieved on 04/19/2024 20:00 UTC)

⁸¹ Matthew Ball : THE METAVERSE: And How It Will Revolutionize Everything, p. 273

⁸² Matthew Ball : THE METAVERSE: And How It Will Revolutionize Everything, p. 172

13 Metaverse and consulting

13.1 KPMG

The homepage of KPMG can be found [here](#).

[From science fiction concept to cutting-edge technology: KPMG's "exploration of the metaverse"](#)⁸³

[We navigate with you into the future of the Metaverse](#)⁸⁴

[Search | KPMG](#)

13.2 Boston Consulting Group

The BCG homepage can be found [here](#).

[BCG: The Hitchhiker's Guide for Businesses through the Metaverse](#)⁸⁵

[The Expanding Health Care Metaverse](#)⁸⁶

[Search | BCG](#)

⁸³ KPMG China: From sci-fi concept to cutting-edge technology: KPMG's "Exploring the metaverse (August 2022), URL: <https://assets.kpmg.com/content/dam/kpmg/cn/pdf/en/2022/03/first-exploration-metaverse.pdf> (Retrieved 02/11/2024, 16:26 UTC)

⁸⁴ KPMG: We navigate with you into the future, URL: <https://assets.kpmg.com/content/dam/kpmg/de/pdf/Themen/2023/04/wir-navigieren-mit-ihnen-in-die-zukunft-metaverse-KPMG-2023.pdf>, (Retrieved 02/11/2024, 16:31 UTC)

⁸⁵ BCG: Bobier, Jean-François / Mérey, Tibor / Robnett, Stephen / Grebe, Michael / Feng, Jimmy / Rehberg, Benjamin / Woolsey, Kristi / Hazan, Joël, The Corporate Hitchhiker's Guide to the Metaverse, April 20, 2022, <https://www.bcg.com/publications/2022/a-corporate-guide-to-enter-the-metaverse-explained>, (Retrieved 03/30/2024 20:37 UTC)

⁸⁶ BCG: Mathews, Madeline / Mérey, Tibor / Adigozel, Ozgur / Busch, Nicolas, The Expanding Metaverse for Healthcare, May 09, 2023, <https://www.bcg.com/publications/2023/the-expanding-reality-of-the-health-care-metaverse>, (Retrieved 03/30/2024 20:54 UTC)

13.3 McKinsey

The McKinsey homepage can be found [here](#).

[Value creation in the metaverse \(PDF\)](#)⁸⁷

[Value creation in the metaverse](#)⁸⁸

[Search | McKinsey & Company](#)

13.4 PwC

The homepage of PwC can be found [here](#).

[PwC 2022 US Metaverse Survey](#)⁸⁹

[Demystifying the metaverse](#)⁹⁰

[Building trust and creating value in the next digital world with PwC's Metaverse services](#)⁹¹

[The metaverse is changing retail and the consumer goods industry](#)⁹²

[Search | PwC](#)

13.5 Deloitte

⁸⁷ McKinsey & Company: Value creation in the metaverse, June 2022, URL: <https://www.mckinsey.com/~/media/mckinsey/business%20functions/marketing%20and%20sales/our%20insights/value%20creation%20in%20the%20metaverse/Value-creation-in-the-metaverse.pdf>, (Retrieved 03/30/2024 21:05 UTC)

⁸⁸ McKinsey & Company: Value creation in the metaverse, URL: <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/value-creation-in-the-metaverse>, (Retrieved 03/30/2024 21:10 UTC)

⁸⁹ PwC: PwC 2022 US Metaverse Survey - Develop a metaverse strategy to achieve sustainable business results, URL: <https://www.pwc.com/us/en/tech-effect/emerging-tech/metaverse-survey.html>, (Retrieved 03/30/2024 21:36 UTC)

⁹⁰ PwC: Demystifying the metaverse - What business leaders need to know and do, URL: <https://www.pwc.com/us/en/tech-effect/emerging-tech/demystifying-the-metaverse.html>, (Retrieved 03/30/2024 21:39 UTC)

⁹¹ PwC: With you in the metaverse - Building trust and creating value in the next digital world with PwC's metaverse services, URL: <https://www.pwc.com/us/en/services/metaverse-services.html>, (Retrieved 03/30/2024 21:47 UTC)

⁹² PwC: The metaverse is changing retail and the consumer goods industry, July 22, 2022, URL: <https://www.pwc.de/de/pressemitteilungen/2022/das-metaverse-veraendert-den-handel-und-die-konsumgueterbranche.html>, (Retrieved 03/30/2024 21:52 UTC)

The Deloitte homepage can be found [here](#).

[Metaverse report - The future is here](#)⁹³

[A whole new world? The metaverse and what it could mean for you](#)⁹⁴

[Virtual worlds, real emotions: Customer experiences in the metaverse](#)⁹⁵

[Cross-Sector Briefing: Metaverse - The future of the Internet?](#)⁹⁶

[The Metaverse and Web3: The next Internet platform](#)⁹⁷

[Search | Deloitte](#)

⁹³ Deloitte: Metaverse report - The future is here - Insights into the global XR industry, URL: <https://www2.deloitte.com/cn/en/pages/technology-media-and-telecommunications/articles/metaverse-whitepaper.html>, (Retrieved 03/30/2024 22:17 UTC)

⁹⁴ Deloitte: A whole new world ? The metaverse and what it could mean for you, URL: <https://www2.deloitte.com/us/en/pages/technology/articles/what-does-the-metaverse-mean.html>, (Retrieved 03/30/2024 22:29 UTC)

⁹⁵ Deloitte: Virtual worlds, real emotions: Customer Experiences in the Metaverse, URL: <https://www2.deloitte.com/de/de/pages/customer-marketing/articles/studie-kundenerlebnisse-im-metaverse.html>, (Retrieved 03/30/2024 22:35 UTC)

⁹⁶ Deloitte: Wege, Egbert / Dr. Gentner, Andreas, Cross-Industry Briefing: Metaverse - The Future of the Internet? February 23, 2022, URL: <https://www2.deloitte.com/de/de/blog/industry-briefings/2022/cross-industry-briefing-metaverse-zukunft-des-internets.html>, (Retrieved 03/30/2024 22:45 UTC)

⁹⁷ Deloitte: The Metaverse and Web3: The Next Internet Platform, July 25, 2022, URL: <https://www.deloitte.com/an/en/our-thinking/insights/industry/technology/web3-and-metaverse-the-future-of-the-internet.html>, (Retrieved 03/30/2024 22:53 UTC)

13.6 Capgemini

The Capgemini homepage can be found [here](#).

[Viewpoint: The metaverse - Cap Gemini - friend or foe for the Chief Marketing Officer?](#)⁹⁸

[Welcome to the metaverse](#)⁹⁹

["TOTAL IMMERSION": HOW IMMERSIVE EXPERIENCES AND THE METAVERSE IMPROVE THE CUSTOMER EXPERIENCE](#)¹⁰⁰

[How will immersive technologies change the automotive industry?](#)¹⁰¹

[Capgemini - Search: Metaverse](#)

⁹⁸ CapGemini: The metaverse: Friend or foe to the CMO? URL: <https://prod.ucwe.capgemini.com/wp-content/uploads/2023/02/Point-of-View-The-metaverse-friend-or-foe-to-the-CMO.pdf>, (Retrieved 03/30/2024 23:04 UTC)

⁹⁹ CapGemini: Welcome to the Metaverse - We are at the beginning of a new digital experience - the Metaverse. URL: <https://www.capgemini.com/about-us/who-we-are/innovation-ecosystem/metaverse/>, (Retrieved 03/30/2024 23:14 UTC)

¹⁰⁰ CapGemini: "TOTAL IMMERSION: HOW IMMERSIVE EXPERIENCES AND THE METAVERSE ARE IMPROVING THE CUSTOMER EXPERIENCE, URL: <https://www.capgemini.com/de-de/insights/research/studie-immersive-experience-metaverse/>, (Retrieved 03/30/2024 23:20 UTC)

¹⁰¹ CapGemini: PREPARING FOR THE METAVERSE - How will immersive technologies change the automotive industry? URL <https://www.capgemini.com/de-de/insights/research/gearing-up-for-the-metaverse/>, (Retrieved 03/30/2024 23:25 UTC)

13.7 Accenture

The Accenture homepage can be found [here](#).

[A new era of digital change begins](#)¹⁰²

[What is the metaverse?](#)¹⁰³

[Building a responsible metaverse](#)¹⁰⁴

[Hardware's new reality - Metaverse in High Tech](#)¹⁰⁵

[The healthcare system colonizes the metaverse](#)¹⁰⁶

[Accenture: Search Metaverse](#)

¹⁰² accenture: The Metaverse Continuum - Start your journey into the Metaverse - where change, imagination and new opportunities meet, URL: <https://www.accenture.com/de-de/services/metaverse-index>, (Retrieved 03/30/2024 23:43 UTC)

¹⁰³ accenture: What is the metaverse? URL: <https://www.accenture.com/us-en/insights/metaverse>, (Retrieved 03/30/2024 23:47 UTC)

¹⁰⁴ accenture: How to build a responsible metaverse - start now, URL: <https://www.accenture.com/nl-en/insights/technology/responsible-metaverse>, (Retrieved 03/31/2024 19:11 UTC)

¹⁰⁵ accenture: Alan, Syed, The New Reality of Hardware - Metaverse in High Tech, November 29, 2022, URL: <https://www.accenture.com/de-de/insights/high-tech/metaverse>, (Retrieved 03/31/2024 19:20 UTC)

¹⁰⁶ accenture: Mohadessi, Shadi, Healthcare colonizes the metaverse, 10 June 2022, URL: <https://www.accenture.com/de-de/blogs/public-service/das-gesundheitswesen-besiedelt-das-metaverse>, (Retrieved 03/31/2024 19:24 UTC)

14 Metaverse and newspapers / magazines

14.1 The Guardian

The Guardian's homepage can be found [here](#).

Enter the [Metaverse](#)¹⁰⁷ : The digital future Mark Zuckerberg is steering us towards

Mark Zuckerberg's [metaverse vision](#)¹⁰⁸ is over. Can Apple save it?

Who needs the [Metaverse](#)¹⁰⁹ ? Get to know the people who still live in Second Life

"The [metaverse](#)¹¹⁰ will be our slow death!" Is Facebook losing its 100 billion dollar gamble on virtual reality?

The [metaverse](#)¹¹¹ will become a digital graveyard if we allow new technologies to distract us from today's problems

The Guardian: [Search Metaverse](#)

¹⁰⁷ Guardian: Milmo, Dan, Enter the metaverse: the digital future Mark Zuckerberg is leading us to, October 28, 2021 21:14, URL:

<https://www.theguardian.com/technology/2021/oct/28/facebook-mark-zuckerberg-metaverse>, (Retrieved 31/03/2024 19:36 UTC)

¹⁰⁸ Guardian: Hern, Alex, Mark Zuckerberg's metaverse vision is over. Can Apple save it? May 21, 2023 11:00, URL: <https://www.theguardian.com/technology/2023/may/21/mark-zuckerbergs-metaverse-vision-is-over-can-apple-save-it>, (Retrieved 03/31/2024 19:50 UTC)

¹⁰⁹ Guardian: Parkin, Simon, Who needs the metaverse? Meet the people who still live on Second Life, 10 June 2023 14:00, URL: <https://www.theguardian.com/technology/2023/jun/10/who-needs-the-metaverse-meet-the-people-still-living-on-second-life>, (Retrieved 04/01/2024 16:18 UTC)

¹¹⁰ Guardian: Rose, Steve, "The metaverse will be our slow death!" Is Facebook losing its \$100 billion contest with virtual reality?, December 07, 2022 07:00, URL: <https://www.theguardian.com/technology/2022/dec/07/metaverse-slow-death-facebook-losing-100bn-gamble-virtual-reality-mark-zuckerberg>, (Retrieved 04/01/2024 16:28 UTC)

¹¹¹ Guardian: Guiao, Jordan, The metaverse will be a digital graveyard if we allow new technologies to distract us from today's problems, November 21, 2022 04:54, URL: <https://www.theguardian.com/commentisfree/2022/nov/21/the-metaverse-will-be-a-digital-graveyard-if-we-let-new-technologies-distract-us-from-todays-problems>, (Retrieved 04/01/2024 16:38 UTC)

14.2 Wired

The homepage of Wired can be found [here](#).

[How to build a better metaverse](#)¹¹²

[It's not too late to save the Metaverse](#)¹¹³

[The US military is building its own metaverse](#)¹¹⁴

[Nike will enable people to design and sell sneakers for the Metaverse](#)¹¹⁵

[Big Tech needs to stop trying to realize their metaverse](#)¹¹⁶

Wired: [Search Metaverse](#)

14.3 New York Times

The homepages of the New York Times can be found [here](#).

New York Times: [Search Metaverse](#)

¹¹² WIRED: Edelman, Gilad, How to build a better metaverse, January 27, 2022 08:00, <https://www.wired.com/story/metaverse-philip-rose-dale-second-life/>, (Retrieved 04/01/2024 16:55 UTC)

¹¹³ WIRED: Cross, Katherine Alejandra, It's not too late to save the metaverse, July 7, 2022 09:00, URL: <https://www.wired.com/story/metaverse-policy-lootboxes-crypto-rights/>, (Retrieved 01/04/2024 17:01 UTC)

¹¹⁴ WIRED: Knight, Will, The US military is building its own metaverse, May 17, 2022 7:00, URL: <https://www.wired.com/story/military-metaverse/>, (Retrieved 04/01/2024 17:07 UTC)

¹¹⁵ WIRED: Perry, Francesca, Nike lets people design and sell sneakers for the Metaverse, November 14, 2022 13:21, URL: <https://www.wired.com/story/nike-will-let-people-design-and-sell-sneakers-for-the-metaverse/>, (Retrieved 04/01/2024 17:07 UTC)

¹¹⁶ WIRED: Volpicelli, Gian M., Big Tech needs to stop trying to realize their metaverse, 31 January 2022 07:00, URL: <https://www.wired.com/story/metaverse-big-tech-land-grab-hype/>, (Retrieved 01/04/2024 17:31 UTC)

14.4 Forbes

The Forbes homepage can be found [here](#).

[The Metaverse is coming - are you ready?](#)¹¹⁷

[The Metaverse explains](#)¹¹⁸

[How to buy a plot and virtual land in the Metaverse - guide for beginners](#)¹¹⁹

[The top 6 cryptocurrencies for the metaverse](#)¹²⁰

[How the metaverse can radically change our lives](#)¹²¹

Forbes: [Search Metaverse](#)

¹¹⁷ Forbes: Taylor, Martin, The metaverse is coming - are you ready?, November 29, 2022, 08:45, URL: <https://www.forbes.com/sites/forbestechcouncil/2022/11/29/the-metaverse-is-coming-are-you-ready/?sh=5f22b8a62115>, (Retrieved 04/01/2024 17:31 UTC)

¹¹⁸ Forbes: Ehrlich, Steven, The Metaverse Explained, March 10, 2023, 12:28, URL: <https://www.forbes.com/sites/digital-assets/article/the-metaverse-explained/?sh=39a788f648bd>, (Retrieved 04/01/2024 18:07 UTC)

¹¹⁹ Forbes: Aras, Burak, How to Buy a Property and Virtual Land in the Metaverse - Beginner's Guide, November 25, 2022 10:30, URL: <https://www.forbes.com/advisor/de/geldanlage/krypto/metaverse-grundstueck-kaufen/>, (Retrieved 04/01/2024 18:07 UTC)

¹²⁰ Forbes: Aras, Burak, The Top 6 Cryptocurrencies for the Metaverse, November 21, 2022 16:44, URL: <https://www.forbes.com/advisor/de/geldanlage/krypto/beste-metaverse-coins/>, (Retrieved 01/04/2024 18:19 UTC)

¹²¹ Forbes: Strzelecki, Robert, How the metaverse can radically change our lives, February 27, 2023 07:15, URL: <https://www.forbes.com/sites/forbestechcouncil/2023/02/27/how-the-metaverse-can-radically-change-our-lives/?sh=7226611323f9>, (Retrieved 04/01/2024 18:25 UTC)

15 Metaverse and Youtube

[The Metaverse: A Guide to the Future of Capitalism](#)¹²²

[Making Sense of VRChat, the "Metaverse" People Actually Like](#)¹²³

[I Played Facebook's VR Metaverse so you never have to](#)¹²⁴

[VRChat: The Better VR Metaverse that already exists](#)¹²⁵

[How the Metaverse will revolutionize everything](#)¹²⁶

[Youtube-Search: Metaverse](#)

¹²² Nicholas, Tom, The Metaverse: A Guide to the Future of Capitalism, URL: <https://www.youtube.com/watch?v=TM00M-dRMBk>, (Retrieved 04/01/2024 19:04 UTC)

¹²³ People Make Games, Making Sense of VRChat, the "Metaverse" People Actually Like, URL: <https://www.youtube.com/watch?v=4PHT-zBxKQQ>, (Retrieved 04/01/2024 19:13 UTC)

¹²⁴ RTGame, I Played Facebook's VR Metaverse so you don't have to, URL: <https://www.youtube.com/watch?v=UdqrFa6pWLA>, (Retrieved 04/01/2024 19:19 UTC)

¹²⁵ RTGame, VRChat: The Better VR Metaverse that already exists, URL: https://www.youtube.com/watch?v=wdBGCI0_wfg, (Retrieved 04/01/2024 19:24 UTC)

¹²⁶ AIXR, How the Metaverse will revolutionize everything w/ Matthew Ball, URL: <https://www.youtube.com/watch?v=AbFuNKI4o2M>, (Retrieved 04/01/2024 19:29 UTC)

16 Metaverse and beyond

On our own behalf: In the event that there are numerous extraterrestrial life forms in our solar system, it is necessary that the avatars can be not only human, but also extraterrestrial. The modeling must be able to depict different aliens of the [Galactic Federation](#) [search]. The aim is to model inhabitants of other planets as avatars.

17 Donations on our own behalf

Dear reader,

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1. Log in to your PayPal account (account must already exist)
2. Send money with GMail account: cdroege91@gmail.com
3. Purpose: personal e-mail address (optional, if feedback is desired)
4. Intended use "Metaverse Navigator-DE"
5. Europe - Send amount: 1 Euro
6. Intended use "Metaverse Navigator-EN"
7. USA - specify amount: 5 dollars

1. Transfer to my IBAN account:
2. IBAN: DE04 7015 0000 1007 6810 08
3. BIC: SSKMDEMMXXX
4. Purpose: personal e-mail address (optional, if feedback is desired)
5. Intended use "Metaverse Navigator-DE"
6. Europe - Send amount: 1 Euro
7. Intended use "Metaverse Navigator-EN"
8. USA - specify amount: 5 dollars