Metaverse
Internet and reality Intersection

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About me

• Computer Engineer
• 20+ year experience in automation, software development and everything that is related to barcodes.
• Hobbies
  • Electronics
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  • 3d Printing
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  • Fishing

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Outline

- Metaverse definition
  - History / Devices
- Use cases
- Why?
- Players
- Challenges
  - Privacy
  - Environmental
- Future
Metaverse != Augmented Reality
Augmented reality

“Augmented reality is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities,...”

https://en.wikipedia.org/wiki/Augmented_reality
Augmented reality
Augmented reality

Metaverse

Reality

Virtual

Virtual
Augmented reality use case example

Image from Quytech web site
Augmented reality in Amazon app

Allows customer to visualize how product will be in home environment
Metaverse Definition
“In futurism and science fiction, the metaverse is a hypothetical iteration of the Internet as a single, universal and immersive virtual world that is facilitated by the use of virtual reality (VR) and augmented reality (AR) headsets. In colloquial use, a metaverse is a network of 3D virtual worlds focused on social connection.

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 advancing virtual reality technology due to increasing demands for immersion. Recent interest in metaverse development is influenced by Web3, a concept for a decentralized iteration of the internet. Web3 and The Metaverse have been used as buzzwords to exaggerate development progress of various related technologies and projects for public relations purposes. Information privacy, user addiction, and user safety are concerns within the metaverse, stemming from challenges facing the social media and video game industries as a whole.”

https://en.wikipedia.org/wiki/Metaverse
Summary

• the metaverse is a hypothetical iteration of the Internet as a single, universal and immersive virtual world

• Metaverse development is often linked to advancing virtual reality technology due to increasing demands for immersion

• Information privacy, user addiction, and user safety are concerns within the metaverse
Summary

• Virtual World (not real)
• Imersive experience
• Interaction with others on this virtual world
Virtual World (Wikipedia)

“A virtual world (also called a virtual space) is a computer-simulated environment which may be populated by many users who can create a personal avatar, and simultaneously and independently explore the virtual world, participate in its activities and communicate with others.”

https://en.wikipedia.org/wiki/Virtual_world
Virtual World (Wikipedia)

No Man’s Sky (game)

EXPLORE

In an infinite universe

Be the first to land on beautiful, unknown planets teeming with life. Survive hazardous environments, where alien civilizations seek their fortune and outlaws take it by force.

https://www.nomanssky.com/?cli_action=1660001058.48
Inmersive Experience

• “Generally speaking, an immersive experience refers to any experience facilitated by digital technology that attempts to imitate a physical world through a digital or simulated world by creating a surrounding sensory feeling, thereby creating a sense of immersion.”

• “In simpler terms, with immersive experiences, one’s perceptual and sensory experiences of the real world are entirely overridden by a virtual experience”

https://www.mobileapps.com/blog/immersive-experience
Inmersive Experience

- Imitate a physical world
- Sensors to create sense of immersion
- The real world are entirely overridden by a virtual experience
Inmersive Experience

• Imitate a physical world
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The Matrix
The Matrix

- The metaverse is a hypothetical iteration of the Internet as a single, universal and immersive virtual world
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- Information privacy, user addiction, and user safety are concerns within the metaverse
What is real?
Why?
No need to be an engineer to know
Bloomberg said

Metaverse may be $800 billion market, next tech platform

Bloomberg Intelligence December 01, 2021

This analysis is by Bloomberg Intelligence Senior Industry Analyst

https://www.bloomberg.com/professional/blog/metaverse-may-be-800-billion-market-next-tech-platform/
According to the most recent analysis by Emergent Research, the size of the worldwide metaverse market is anticipated to reach USD 1,607.12 billion in 2030 and see a revenue CAGR of 43.3% over the projected period. ...
Global Metaverse Market Set to Reach USD 659.7 Billion by 2030, With a Sustainable CAGR of 37.5% | Growth Market Reports

• “… the market was valued at USD 37.9 billion in 2021 and is projected to reach USD 659.7 billion by the end of 2030, expanding at a CAGR of 37.5% during the forecast period, 2022-2030. …”

https://www.tmcnet.com/usubmit/2022/08/03/9650149.htm
Virtual Reality Market

U.S. Virtual Reality Market size, by device, 2020 - 2030 (USD Billion)

Source: https://www.grandviewresearch.com/industry-analysis/virtual-reality-vr-market
Virtual Reality Market

Source: https://www.grandviewresearch.com

https://www.grandviewresearch.com/industry-analysis/virtual-reality-vr-market
Is it a totally new idea?
Virtual Boy 1995

- The Virtual Boy is a 32-bit tabletop portable video game console developed and manufactured by Nintendo. Released in 1995.
VR Games on 90’s

https://www.youtube.com/watch?v=dji9YiPZ4AM
90’s technology
Open World games
Second Life

- https://secondlife.com/

Expect the Unexpected

With thousands of virtual experiences and communities, you'll never run out of places to explore and people to meet. Music clubs, roleplaying communities, virtual cinemas and more. Second Life is always wonderful, sometimes weird, and 100% wow-worthy.

Explore Now
Second Life

- https://secondlife.com/
- Launched In 2003
- In 2019, launched Tilia, a registered money services business and fully licensed money transmitter that powers virtual economies.
- By Linden Lab was founded in 1999 and is headquartered in San Francisco with additional offices in Seattle, Boston, Davis, and Charlottesville.
Second Life

- https://secondlife.com/

Remote Meetings Redefined

Make meetings fun again with virtual hangout spaces, classes and conferences. For over a decade, leading companies and educators have trusted Second Life for branded social spaces for events and remote meetings.

Learn More
Second Life

- https://secondlife.com/

Imagine the Possibilities
Shop the Second Life Marketplace to discover millions of items including virtual fashions, home decor, and more. Create and monetize your own creations to earn real profits in a virtual economy powered by Tilia.

Shop Now
Limitation

- Second life character lives in secondlife world
- I do not know anyone that uses secondlife
Google glass

- Release 2013
  - Is it arround? I do not know.

- On June 20, 2013, Rafael J. Grossmann, a Venezuelan doctor practicing in the U.S., was the first surgeon to demonstrate the use of Google Glass during a live surgical procedure.

- In July 2014, the startup company Surgery Academy, in Milan, Italy, launched a remote training platform for medical students.

Source: https://en.wikipedia.org/wiki/Google_Glass
We know what is.  
We had related stuff build.  
Why I am not using it?
Is not simple
Challenges
Starts with a Simple Representation
Two persons
Think of Beautiful dog
Google? Beautiful dog
Problem

- Person cannot see other person dog
- We cannot read minds (neither computers)
- One dog cannot interact with the other
What is needed for the two to interact

- Common platform
- Information sharing
- Set of rules
  - Rules need to be enforced by some kind of government
Challenges

- Compatibility
- Storage
- Desentralization
- Security/Privacy
Challenges

- Compatibility – technical challenge
- Storage – technical challenge
- Desentralization – technical challenge
- Security/Privacy – Political challenge
Platform - Compatibility

- Provides access from one world to the other
- Decides who, what and how information is shared
- The platform owner is God
Platform

WITH GREAT POWER COMES GREAT RESPONSIBILITY
Platform

With great power comes...
Platform

• Storage
  – Every day, we create more than 2.5 million terabytes of data.
• We may need multiple storage sites
• Data integrity is an issue
Platform – Data Integrity

- Blockchain
  - Desentralizado
  - High processing power
  - High energy consumption
Platform – Privacy
Platform – Privacy

Facebook data privacy scandal: A cheat sheet

Read about the saga of Facebook's failures in ensuring privacy for user data, including how it relates to Cambridge Analytica, the GDPR, the Brexit campaign, and the 2016 US presidential election.

Zuckerberg Summoned to Testify Over Shocking Consumer Privacy Violations

15 days ago

Racine's lawsuit accused Zuckerberg of 'directly participating in decision-making that allowed the Cambridge Analytica data breach.'
Platform – Privacy

- What can be said?
- There is no actual privacy as we know
- The perception of privacy will be determined by the platform owner or ruler
- New laws may need to exist and an enforcement agency
Players
Players

Meta

Amazon

Microsoft
Microsoft Altspace VR

[Image of avatars]

AltspaceVR
Be together, anywhere.

https://altvr.com/
Devices

Microsoft Oculus Rift

- Release in 2016

Environment
Environment

• “We found that streaming a two-hour high-definition film on Netflix [or another online provider] equates to boiling over 10 kettles of water,” said Mike Hazas, a researcher in sustainable computing at Lancaster University.

  - https://www.thetimes.co.uk/article/energy-used-in-streaming-one-film-on-netflix-makes-60-cuppas-0hkp690rm
Harry Potter

- 8 Movies
- 19 hours and 39 minutes
- 2h \( \times x = 10 \) kettle
- \( X = 5 \) kettle/hr
- \( 19.65 \times 5 = 98.25 \) kettle

Image: https://sites.psu.edu/moviesgalore/2015/03/11/harry-potter-the-boy-who-lived/
Apple’s Mesa Data Center

- Area: 1,300,000 square feet
- Location: Arizona, United States
- It has a 50 MW capacity, which is enough to power about 12,500 homes
- 300-acre solar power plant in Florence, Arizona (not enough)

What's the carbon footprint of an email?

- Sending even a short email is estimated to add about four grammes (0.14 ounces) of CO2 equivalent (gCO2e) to the atmosphere.

- To put this into perspective, the carbon output of hitting "send" on 65 mails is on par with driving an average-sized car a kilometre (0.6 of a mile).

Got the idea?
Future – Conclusion

3 Final things
#1 Not if but when

- When money involved, no stop
- Concept may change
- We are the ones who decide what to change
#2 Hardware needs to evolve

- Affordable
- Multiple ways to interact, not one single type of device
  - Ways to consume the metaverse needs to be everywhere in order for it to succeed.
#3 When is real?

- A game or real life?
- Untill when?
- What other countries be doing while people hang out in the metaverse?
- We do not eat virtual food nor virtual clothes cover from cold
Who’s in power?
Who decides?
What if?
Should I care?
Should I care

Consumer

Maker
thankyou