Metaverse

What is it?

How did we Get Here?

What is Next?

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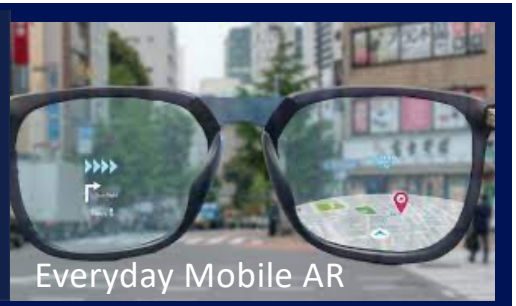
What is Metaverse?


Virtual work


Digital Law, Policy & Regulation


Everyday Mobile AR

IoT for Digital Twins


Constructed virtual space

The Internet as a Game


Virtual entertainment

Digital goods


Blockchain and Web3


NFT Art

Our definition:

Metaverse is an extension of “cyberspace”

In many cases, you can replace the word “metaverse” with “cyberspace” and communicate the same intention.

Cyberspace is a global domain within the information environment consisting of the interdependent network of information systems infrastructures including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. In other words, it is the Internet and all the infrastructure needed to make it work

Metaverse is an Evolution of Cyberspace

Google
Amazon

Facebook
LinkedIn
Twitter

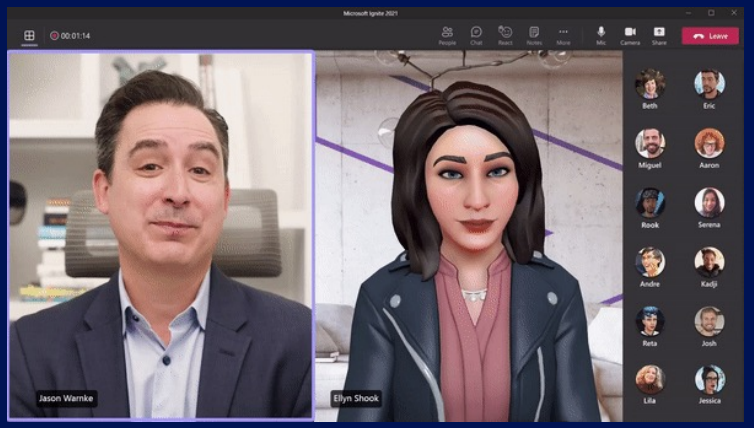
World of Warcraft
Fortnite
…

Metaverse in the Near-Term

A game-like view and experience to the Internet or Cyberspace Applications

- Does it dependent on AR/VR → No, that is probably 10+ years away
- Does it Web3? → No, but data ownership and security are real issues
- Does it depend on blockchain, crypto, or financial transactions? → No, but crypto is useful for NFTs as digital goods.

While these technologies are likely to emerge, they are not required

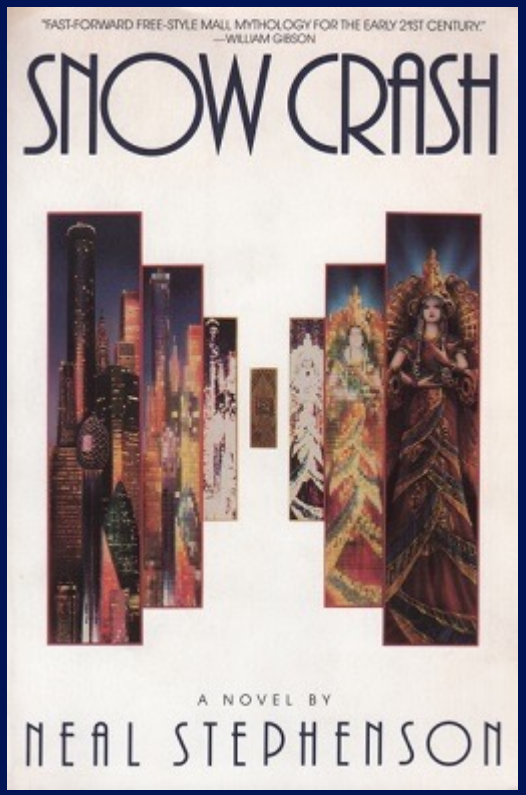


Microsoft Teams enters the metaverse race with 3D avatars and immersive meetings (link)

Metaverse as a Literary Evolution

- Metaverse coined by Neal Stephenson in 1992 novel *Snow Crash*
- The idea was a persistent, shared environment that blurred the digital and physical for everyone who entered it.
- The *Metaverse* is the successor to the Internet
- Status in the Metaverse is a function of two things:
  - access to restricted environments such as the Black Sun, an exclusive Metaverse club, and
  - technical acumen, which is often demonstrated by the sophistication of one's avatar.

Wikipedia: Stephenson's "Metaverse"[44] appears to its users as an urban environment, developed along a single hundred-meter-wide road, the Street, that runs around the entire 65,536 km (2^{16} km) circumference of a featureless, black, perfectly spherical planet.[45] The virtual real estate is owned by the Global Multimedia Protocol Group, a fictional part of the real Association for Computing Machinery, and is available to be bought and buildings developed thereupon.[45]



"In the Beginning... Was the Command Line",199 Essay by Stephenson

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'

Metaverse has a continuum of Possibilities

Functional Web

Practical Game-like Interface to Web Applications

Immersion With Behavior And Senses

Navigate your Path: Google of Metaverse:

Guide you
Track You
Predict you
Model you

Your Autonomous Twin lives in Metaverse

Simulated Workplace or Factory

IoT objects also live in digital world

The handicapped walk in the Metaverse

Metaverse robots walk in the physical world

The physical and digital world is Blurred.

Multiple worlds with access requirements

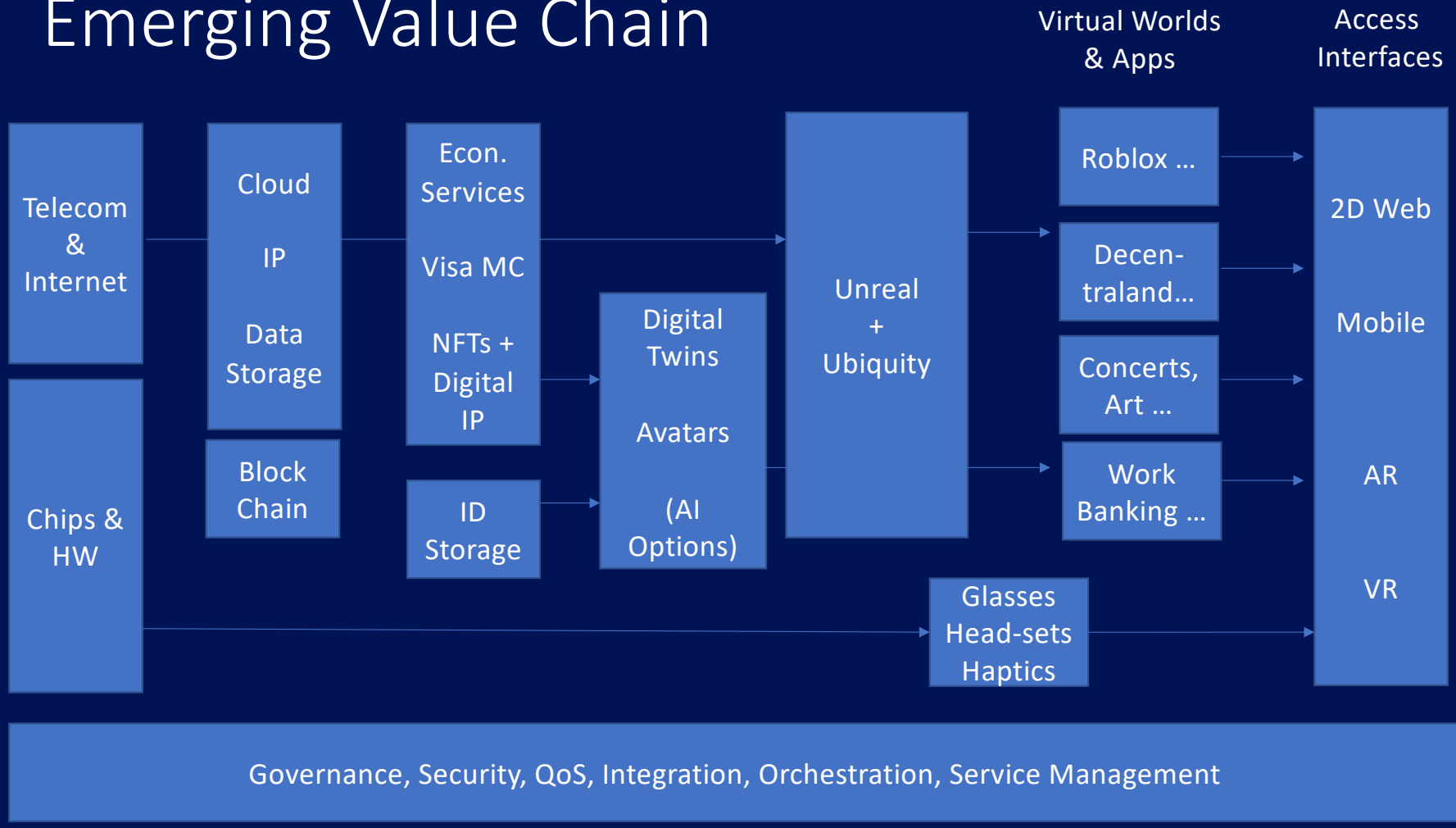
Metaverse:

Does it have value? → Yes

- Virtual Experiences have real value:
  - Consider games, movies, and virtual goods
  - Experiences can be better that reality
- Environmental Sustainability:
- Enables more people to have rare experiences without environmental damage
- One step or maybe two from the Matrix

McKinsey says $120B already invested in metaverses in 2022, more than doubling the 2021 total amount of US$57 billion.

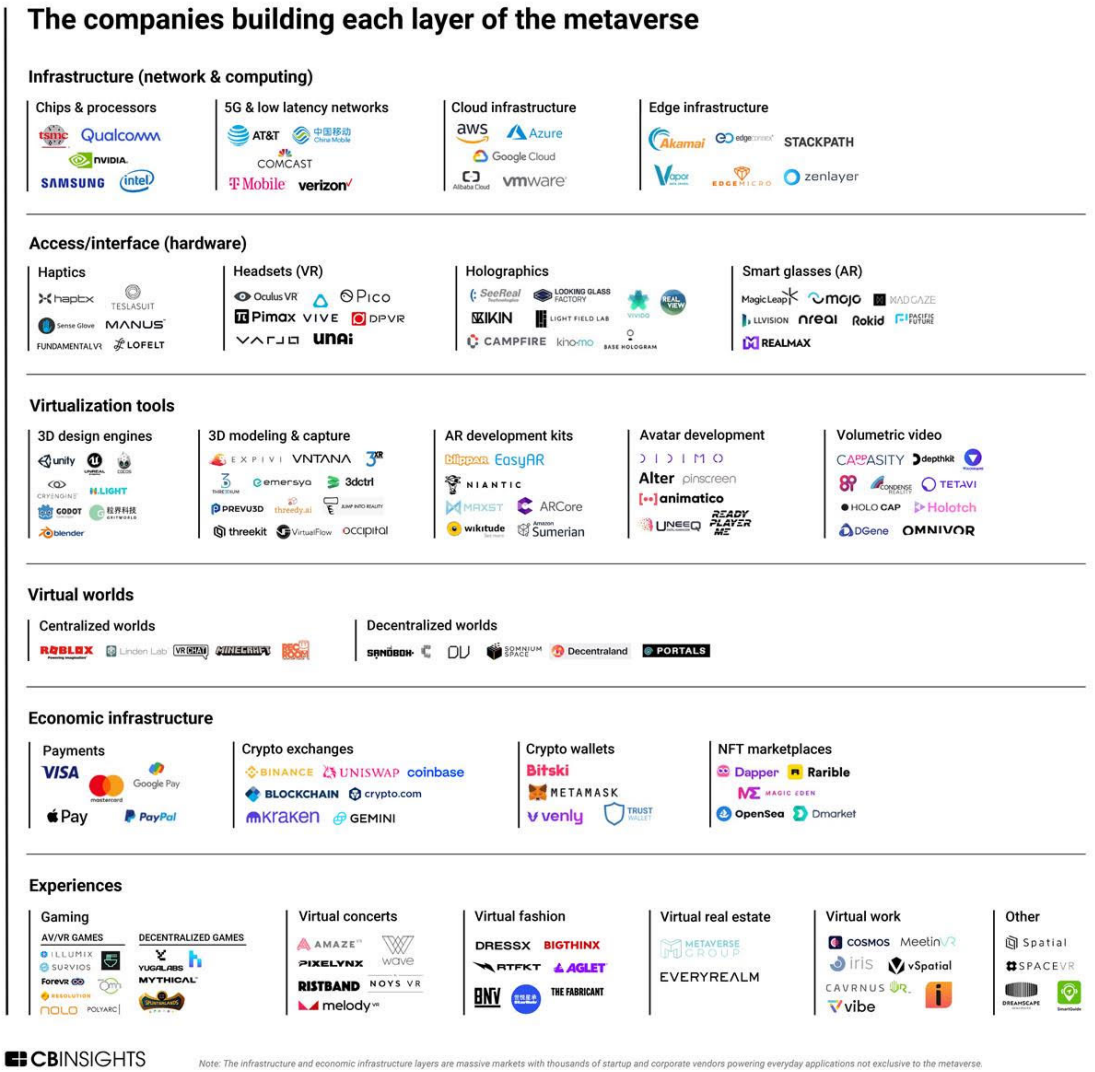
Emerging Value Chain



Also see ICIOT 2021: Internet of Things – ICIOT 2021 pp 102–120 Cite as MRA: Metaverse Reference Architecture, Liang-Jie Zhang

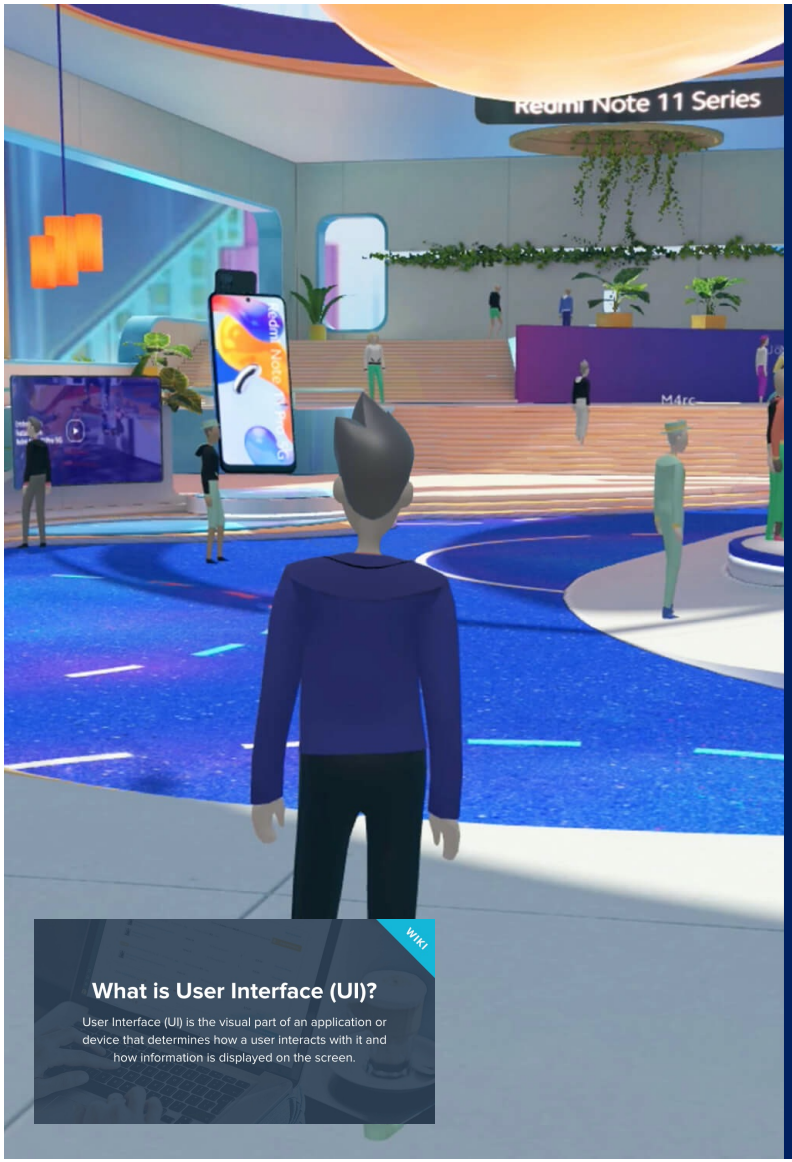
Some of the Players Are Identified Here →

Also see:
Sophie, Digital Human Avatar by Deloitte
Touchcast
Yuga Labs, Moonpay, Animoca



Is this the same as Web3?

- No: Web 3 is block chain-based Internet
- Term is coined by crypto-community
- But is has some merits:
  - ID is still a problem
  - Ownership of your data is not solved
  - Security is not solved – and getting worse
  - Moving money is still messy
- However – blockchain/crypto can't solve these issues
- Metaverse may benefit from aspects of Web3



Known Issues and Discontinuities

- 2D: Assume headsets/glasses not practical for a decade
- User-centric model of Metaverse:
  - Productivity and entertainment
  - Every company will need a metaverse strategy. As in past, a web strategy then a mobile strategy
  - Interactions: talking vs typing
- What are the ideal game-like experiences:
  - banking, movie watching, virtual concerts, virtual real estate, virtual work in every profession, etc.
  - Will you shop in an Amazon metaverse mall have packages delivered or go to the metaverse doctor's office and
- What is the navigation model. Where are there an entry points on the web? How do you move or search? Will you need a passport to some regions?

Known Issues and Discontinuities II

Avatar twins:

- Levels of autonomy
- What makes a twin (asset and person)
- Where will identity be stored. Will it be yours, is it distributed, is it keyed to biometric information
- Where and how does AI fit with digital twins

Security: Let's assume security is utterly broken

- See Pegasus – assume wide-spread usage
- Will keys, biometrics, government ID, or familiarity solve it?
- Security is harder in the metaverse.
- Avatar ID Theft
- Data regulation

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Government Policy:

- Every action in the metaverse will require the policy parallel of whether it happened in real life.
- How are conflicts resolved (in or outside the metaverse). Are digital entities punished or only their owners
- Passports and controlled access to work in digital worlds where money and borders are involved

Revenue Models

- How will every firm participate in a metaverse economy.
- Will game revenue models apply?
- Advertising, premium avatars, buying extra lives/time in experiences

https://www.nytimes.com/2022/01/28/magazine/nso-group-israel-spyware.html
https://en.wikipedia.org/wiki/Pegasus_(spyware)

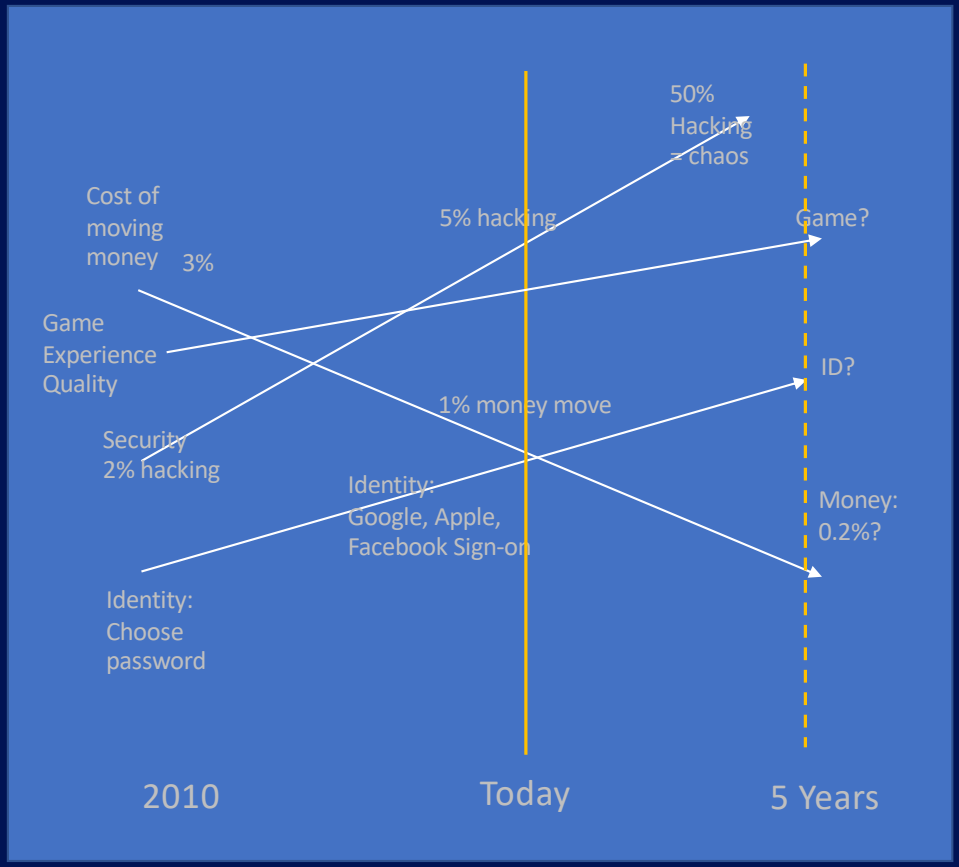
https://medium.com/coinmonks/ten-business-models-in-metaverse-72587f42048b

Can we see the major factors that will affect this future?

- Security
- State of identity
- Ease/cost of moving money
- Avatar Twin / Game quality
- Headset Quality

Underlying drivers:

- Nvidia→ graphic co-processing → ?
- Internet costs (dropping with high pressure on telecoms)
- Battery life (5% annual improvement)



What Technologies Will Need to Be Developed?

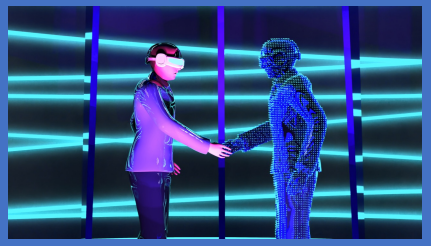
- Advanced glasses
- Order of Magnitude more demand in computing and/or new GPU architectures
- Biometric validation / Edge of network validation
- Brain to computer input interfaces for robotic control, prosthetics
- Carbon neutral blockchain consensus
- Containerized avatar identity and human memory model to remember history
- The “upload” capability to an empty ID
- Bidirectional IOT to digital twin connectivity models
- Simplified game and VR reality generation tools (WIX for Meta)
- More ..

Our first guess

How can we envision a metaverse future and the associated problems, solutions, and connectors?

New Impact Xcelerator operates at the boundary between research and entrepreneurship

- Assume that Series A Startups Today are closest to the state of the art for a 5-year window.
- Study each firm in the ecosystem to understand the direction of security, experiences, money transfer, and more.
- Compare with peer review literature
- Then find the research question and/or opportunities



Impact Xceleration