

Knowing More About Metaverse

認識元宇宙

by
Ir Dr FC Chan

19 October 2022



Contents (Part I)

1. Book and movies
2. Technologies
3. AR, VR, MR, XR
4. Decentralization
5. Blockchain
6. Metaverse value-chain



Metaverse

Wikipedia defines the metaverse as follows:

In futurism and science fiction, the metaverse is a hypothetical iteration of the Internet as singlet, universal and immersive virtual world that is facilitated by the use of virtual reality and augmented reality headsets.

In colloquial use, a metaverse is a network of 3D virtual worlds focused on social connection.

Individual users have their respective avatars (similar to the user's physical self, to experience an alternated life in the virtuality)

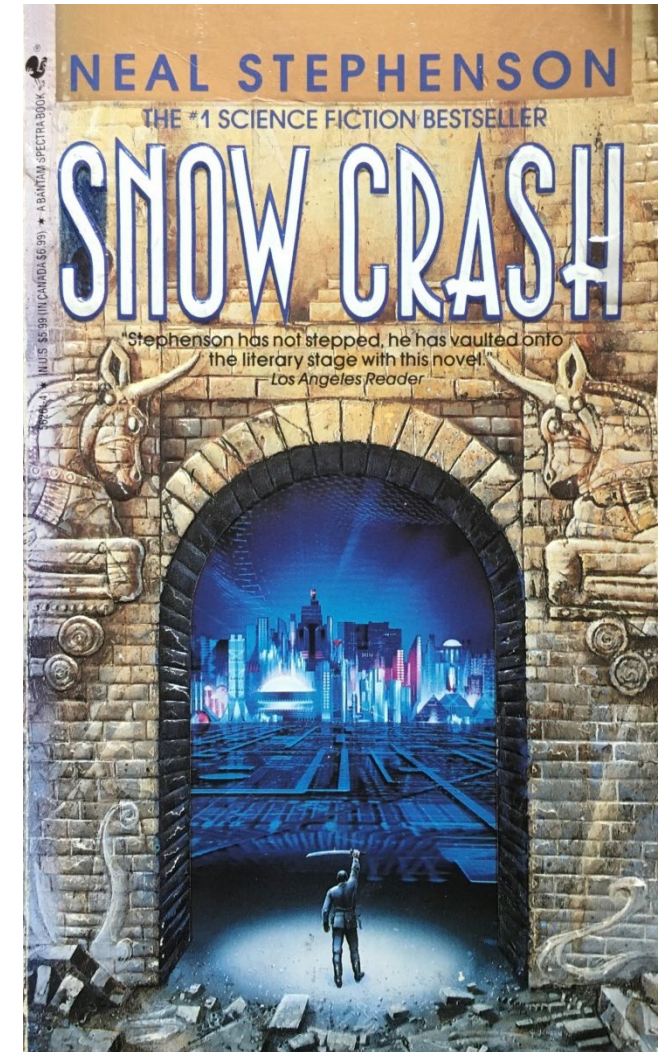
Knowing more about Metaverse 1. Book and Movies

Book: Snow Crash (1992)

Science fiction book by
Neal Stephenson

Metaverse is the name of
the network world

Use headset for VR



Ready Player One (2018)

Real World

Virtual World



Avatar (2009)



Metaverse

Metaverse = meta + universe

Metaverse is not a company name

Facebook changed corporate name to
Meta (Zuckerberg announced in 2021)



Internet starting from 1995

PC, smart phone, VR headset +eyeglasses

Metaverse starting from 2021

BIGANT: Blockchain, Interactivity, Game, AI, Network(5G), T(IoT)



Metaverse

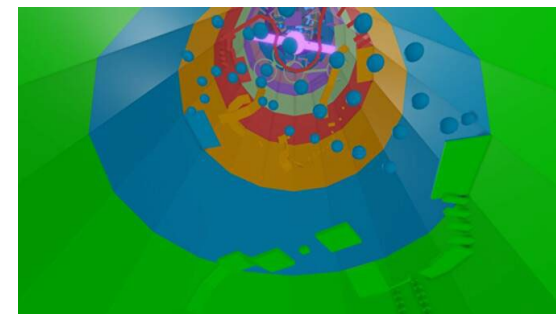
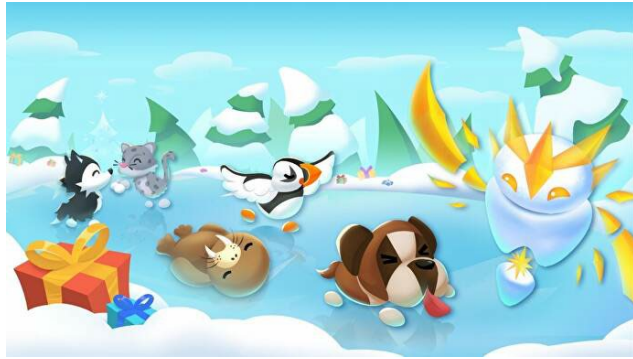
A virtual world built in real world for social, entertainments, create, exhibit, educate and exchange activities.

Eight key characteristics of Metaverse: Identity, Friends, Immersive, Low Friction, Variety, Anywhere, Economy, Civility

**Avatar化身, identity in virtual world
Low Friction: minimum delay**

Knowing more about Metaverse

Roblox games



On-line game platform and game creation system, Robux is its virtual currency.

Knowing more about Metaverse



Travis Scott singing show in Castle Night

Real world uses Virtual world to hold events



AI Seminar held at Animal Forrest



Graduation Ceremony UC Berkeley held at Minecraft



Metaverse environment

1. Graphic Display power, GPU
2. VR technologies
3. AI technologies
4. Games Engine
5. Blockchain technologies

AR and VR

AR
Augmented
Reality

VR
Virtual
Reality

Group1 (without VR, without AR)



Group2 (without VR, with AR)



Group3 (with VR, without AR)



Group4 (with AR, with VR)

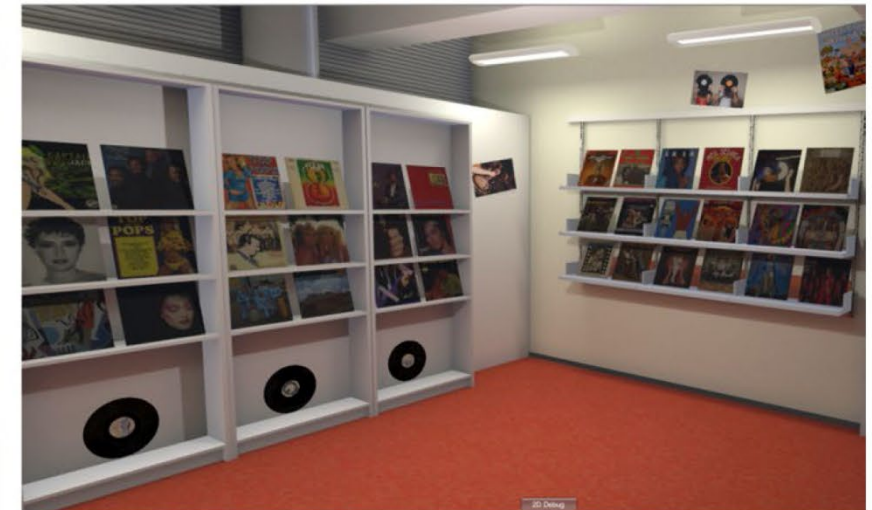


Photo taken with Augmented Reality



At Zero Carbon Building



Device with Augmented Reality



Game with Augmented Reality

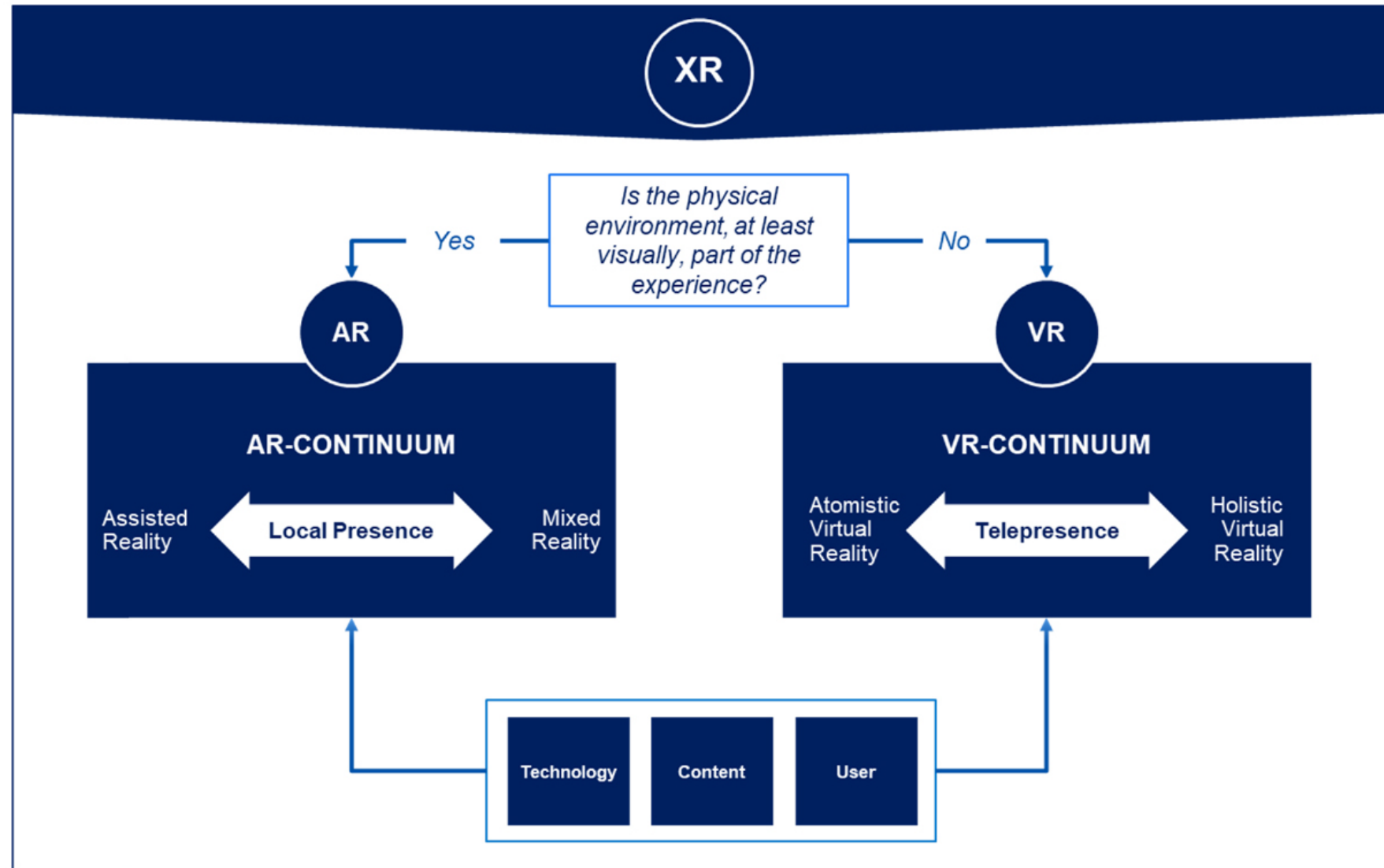


Adding additional image and explanation in real world

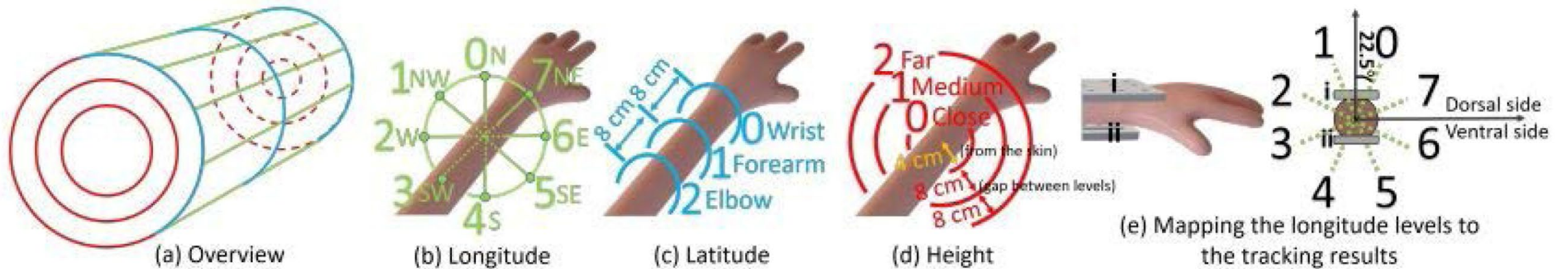
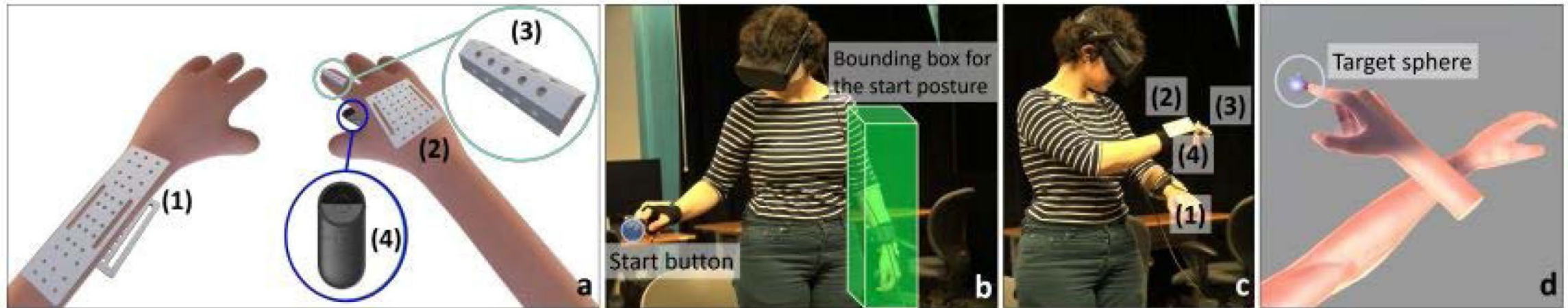
 **Augmented Reality**



MR and XR



Head and hand devices



Head and hand devices



Training with Augmented Reality



Training with Mixed Reality





SWIFT

Society Worldwide Interbank Financial Telecommunication

Devil inside small details



APP air-ticket > airlines company
 insurance > insurance company

Devil inside small details

Travel company



Bitcoin

A decentralized digital currency that can be transferred on the peer-to-peer bitcoin network. Bitcoin transactions are verified by network nodes via cryptography and recorded in a public distributed ledger called a blockchain.



Binance - Buy, trade and hold cryptocurrencies

Binance coin	BNB
Bitcoin	BTC
Ethereum	ETH
Galxe	GAL
Green Metaverse Token	GMT

全球最大加密貨幣交易所遭入侵 黑客竊取幣安7.8億港元

2022-10-08 16:41



幣安 (Binance) 遭黑客入侵。REUTERS



Phone and Other Deception

上市公司女副總裁墮加密貨幣投資陷阱 誤信LINE廣告失1660萬積蓄借款

2022-10-07 13:52



上市公司女副總裁墮LINE加密貨幣騙案。

女子墮投資加密幣騙局 連積蓄加借貸盡失1660萬

2022/10/07 11:11:47



警方不時宣傳防止電話騙案手法，但仍有受害人中招。

Blockchain

A digital database or ledger that is distributed among the nodes of a peer-to-peer network.

A database structures its data into tables, whereas in blockchain, structures its data into blocks (stringing them together). When a block is filled, it is set in stone with timestamp.

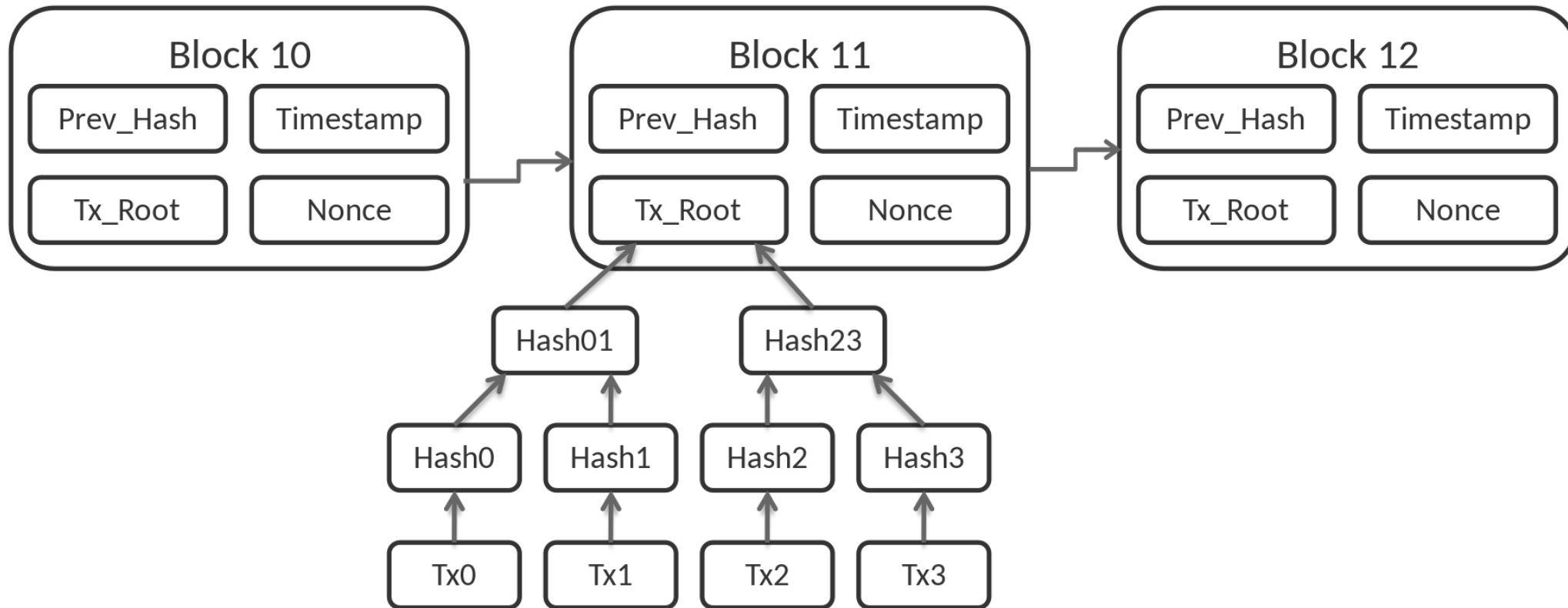
Blockchain allowing database to be spread out in various network nodes at various locations.

Blockchains are best known for their important role in crypto-currency systems (e.g. Bitcoin) for maintaining a secure and decentralised record of transactions.

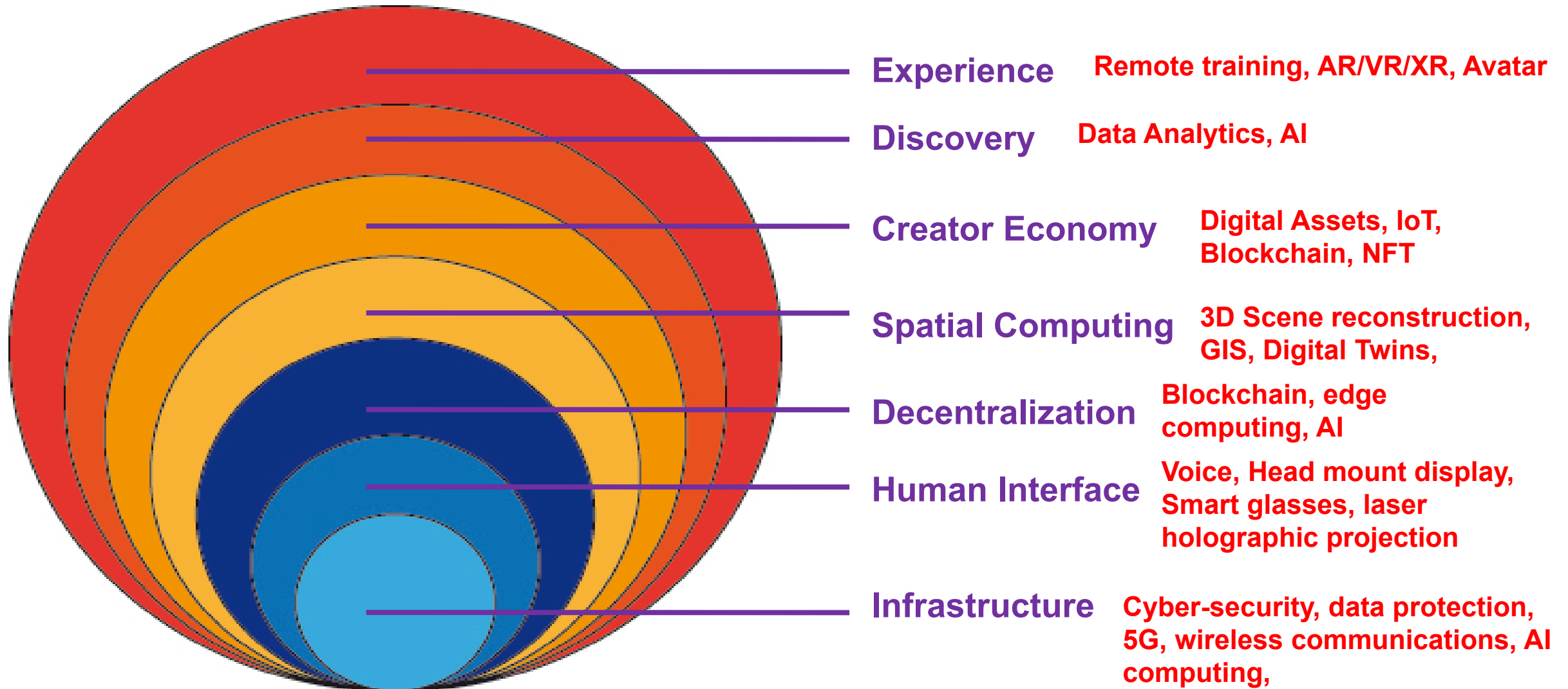




Blockchain: Information from Wikipedia



Previous Cryptographic Hash, Time stamp, Transactions Root, Nonce



Shared resources with independent indemnification, not belong to one organization



Contents (Part 2)

7. NFT

8. 5G

9. AI

10. IoT

11. Game, Art and Culture

12. Future Look

Conclusion

Questions and Answers



Owned, sellable

Author: 0xc0ffec254729296a45a38B5639AC7E10F9d54579
Smart contract address: 0xA395b25755DB825Ba23eAE0ee76846a4A880888F
Smart contract's ID: 49214

Not copyrightable, but can be owned

Depends on contract

Non-fungible token

getURLfromID(49214)

http://127.0.0.1:8080/protocol/kqUMyOAGQ8Wf7iEx07H0PktuBtEtahsdxv4n15fY2GzGrm1rAVzzzb1fkPpb1aX4eVrXr3i3U1Arad4q9v

Art, assets, files, etc.



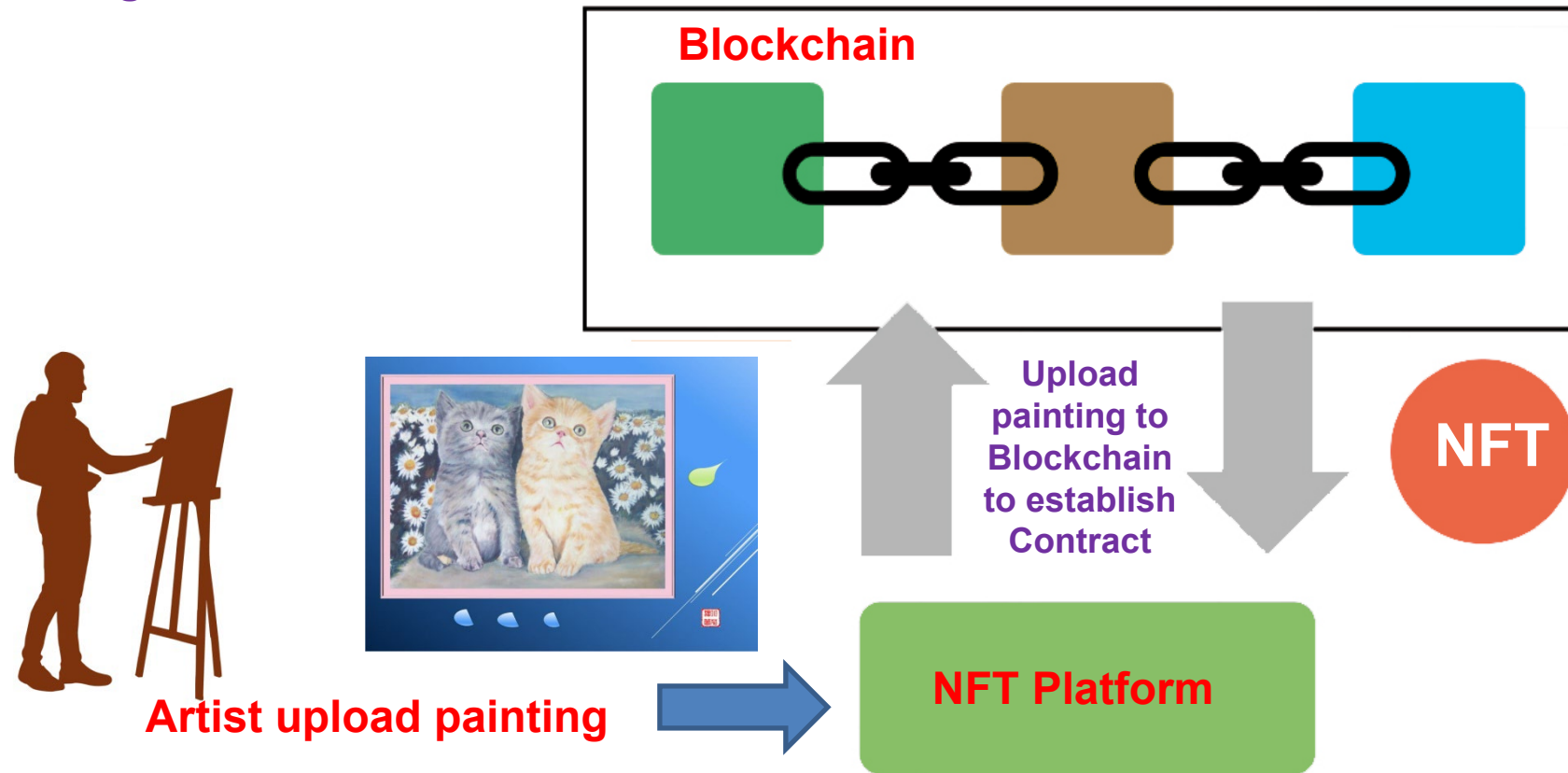
NFT 非同質化代幣 is a record 帳簿 on a blockchain 區塊鏈 which is associated with a particular digital or physical asset. The owner of NFT is recorded in the blockchain. The record is backup at various locations in the network, hence requiring a lot of crypto work requiring vast electrical energy (100TWh in one year). NFT is unique.

Metaverse and NFT is related. Need to be decentralised.



NFT

Linking Painting and NFT





NFT in picture head



Little Fighter
Mar 2021



2222 Monkey Kingdom
32x32 pixel



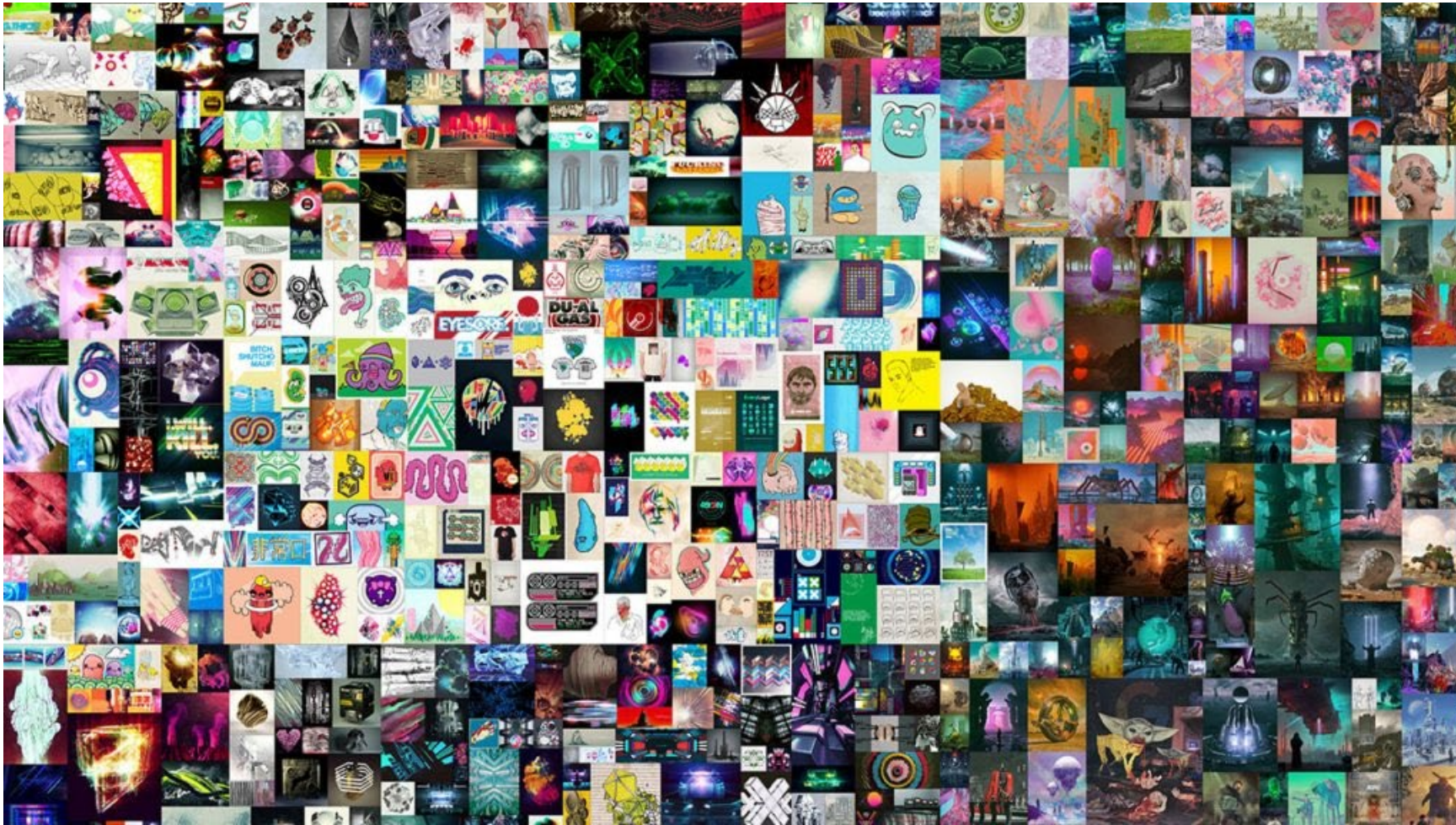
10000 Phanta Bear
1 Jan 2022
Sold out in 40 min
0.26 Eth = US\$1000



#9 CryptoPunk#5217

US\$ 5,590,000

Knowing more about Metaverse 7. NFT



#1 Everyday: the First 5000 days (Beeple)

US\$ 69,300,000

Knowing more about Metaverse



Damien Hirst

10000 paints each sold at £1800

5149

Real

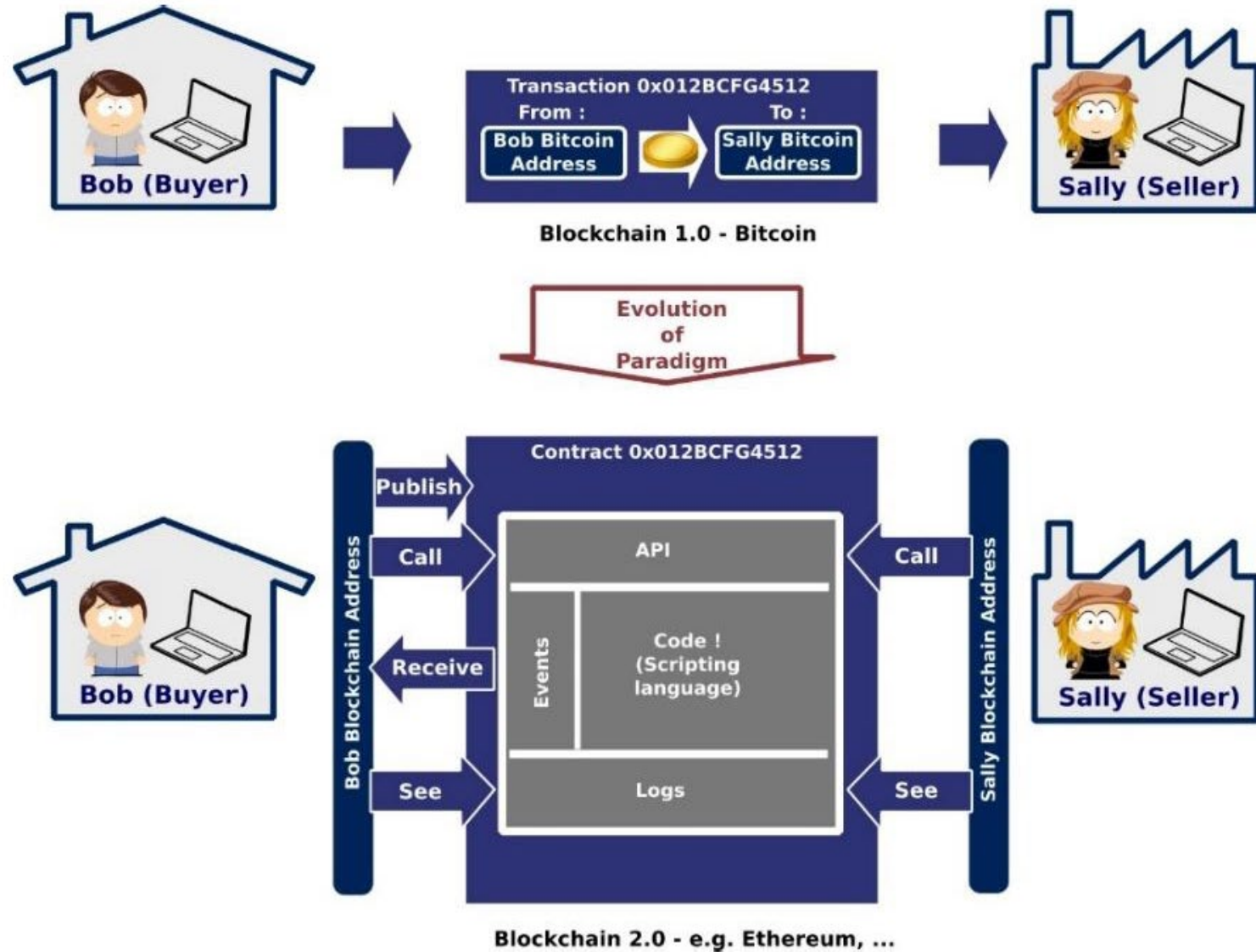
4851

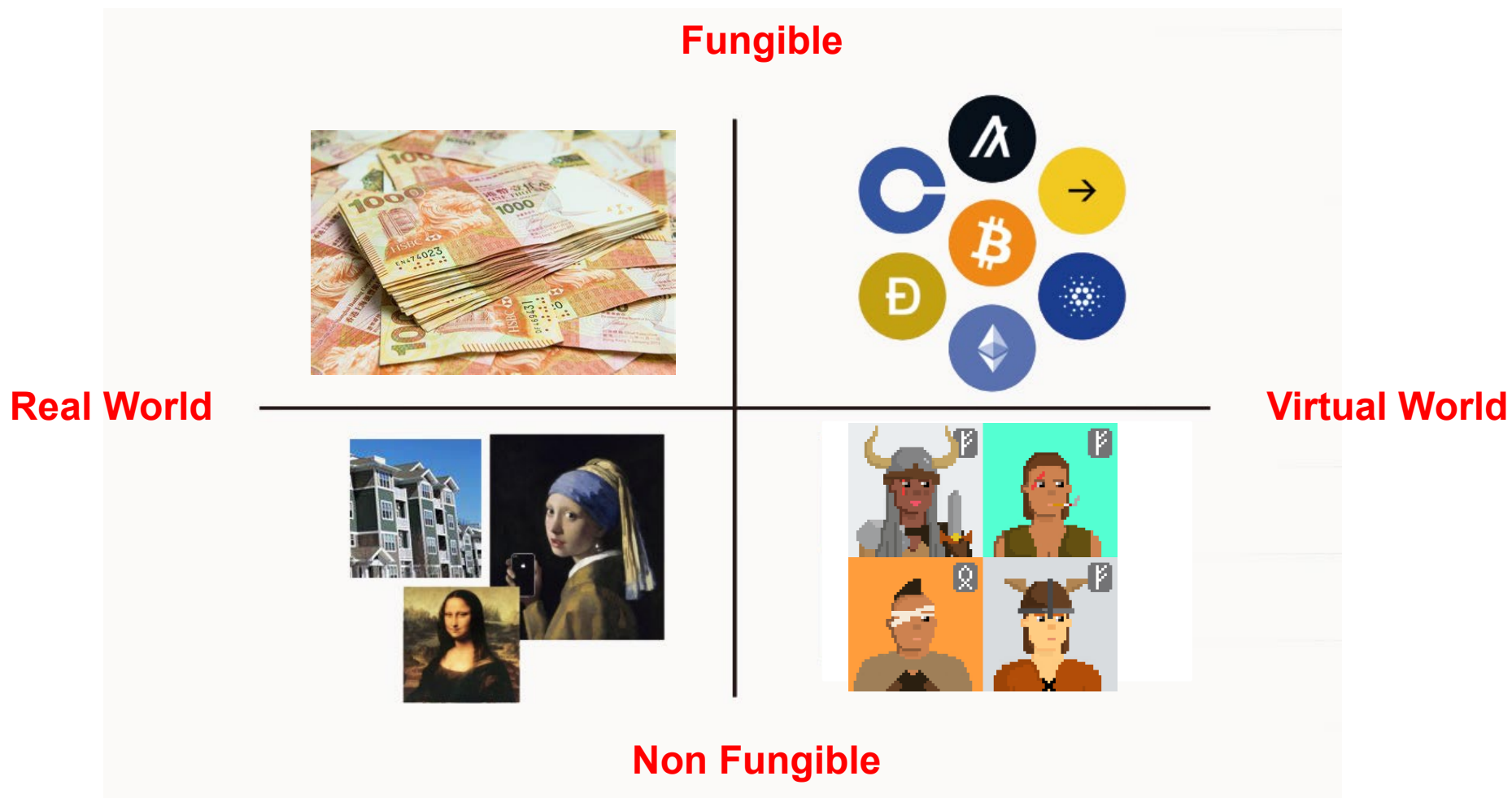
NFT



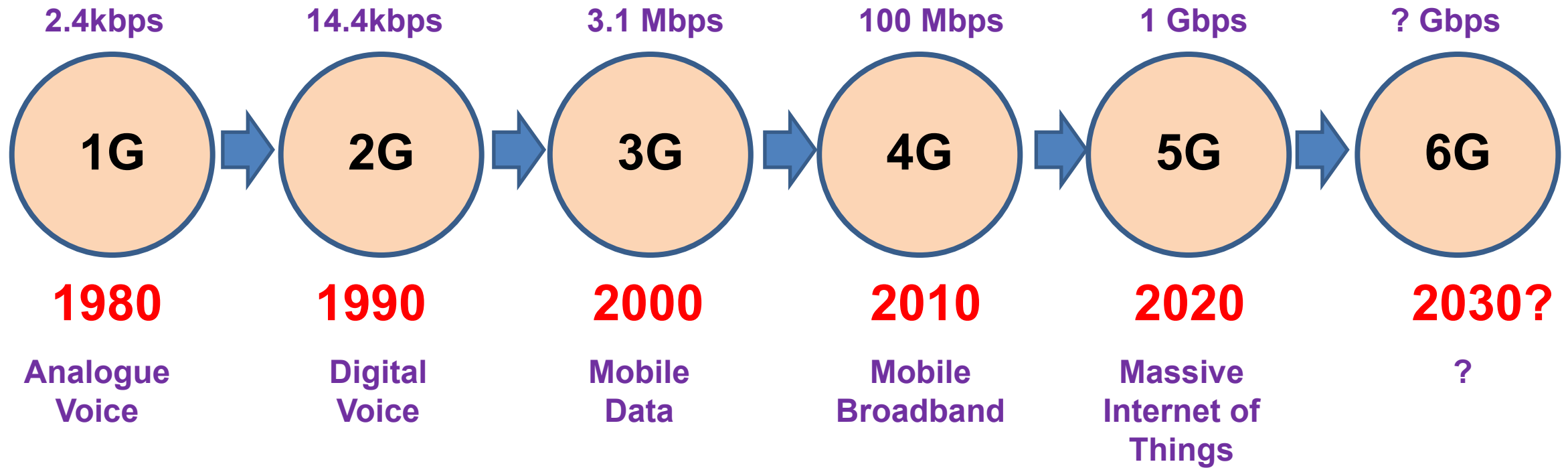


Blockchain and NFT



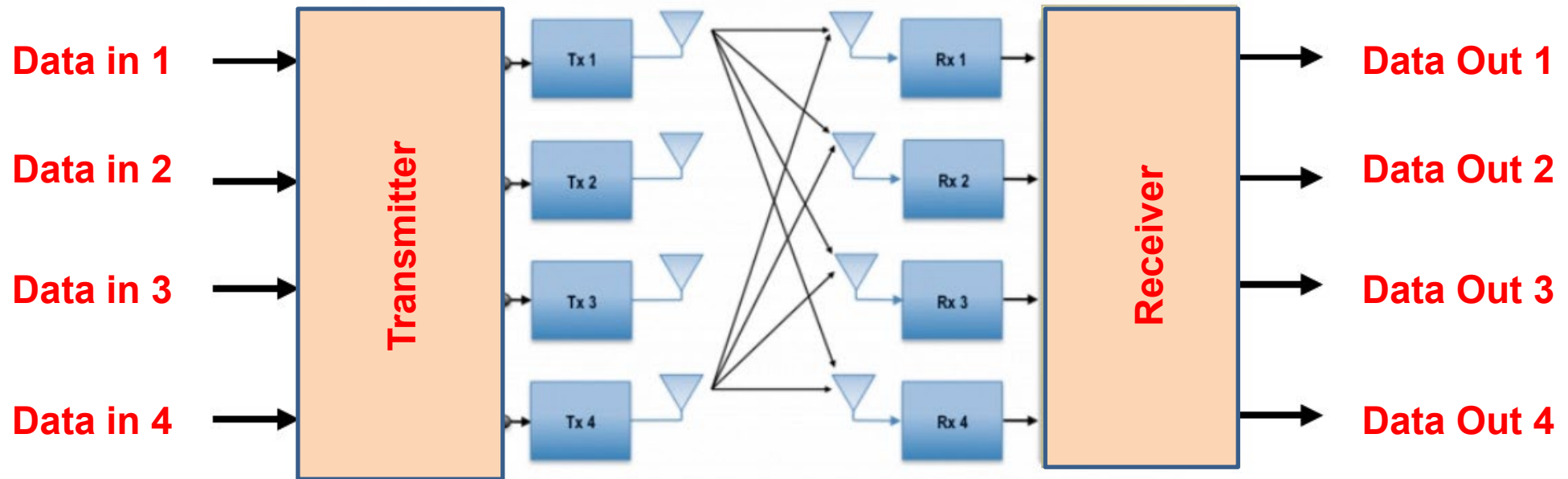


同質化 Fungible: can be substituted, can be divided
非同質化 Non-fungible: cannot be replaced, cannot be divided





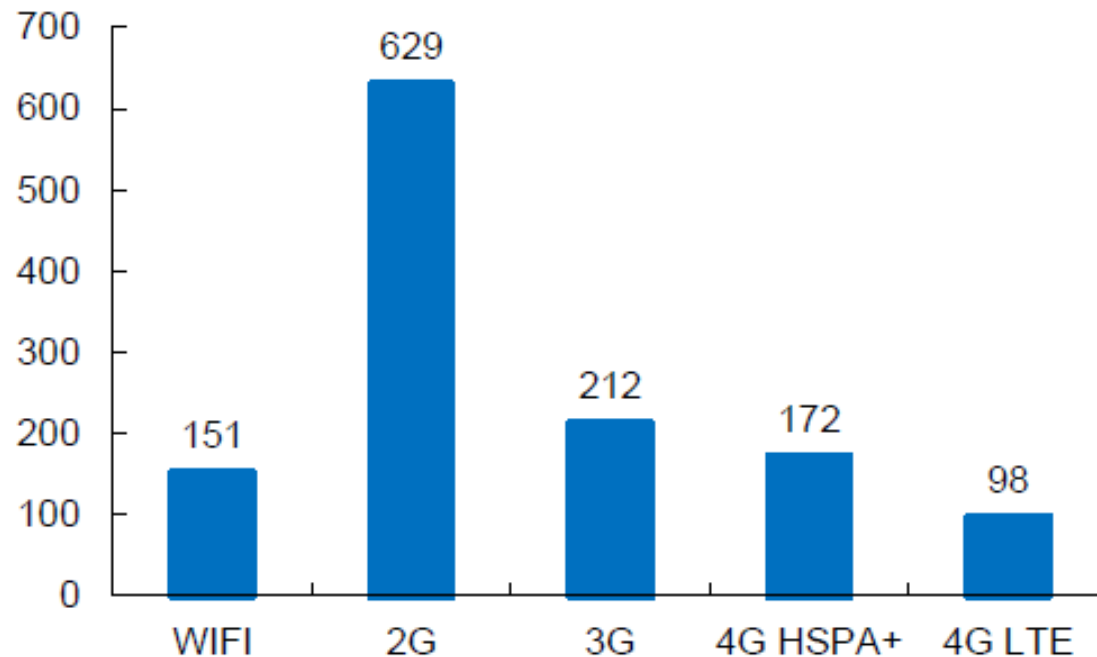
5G utilizing Multi-antenna communication



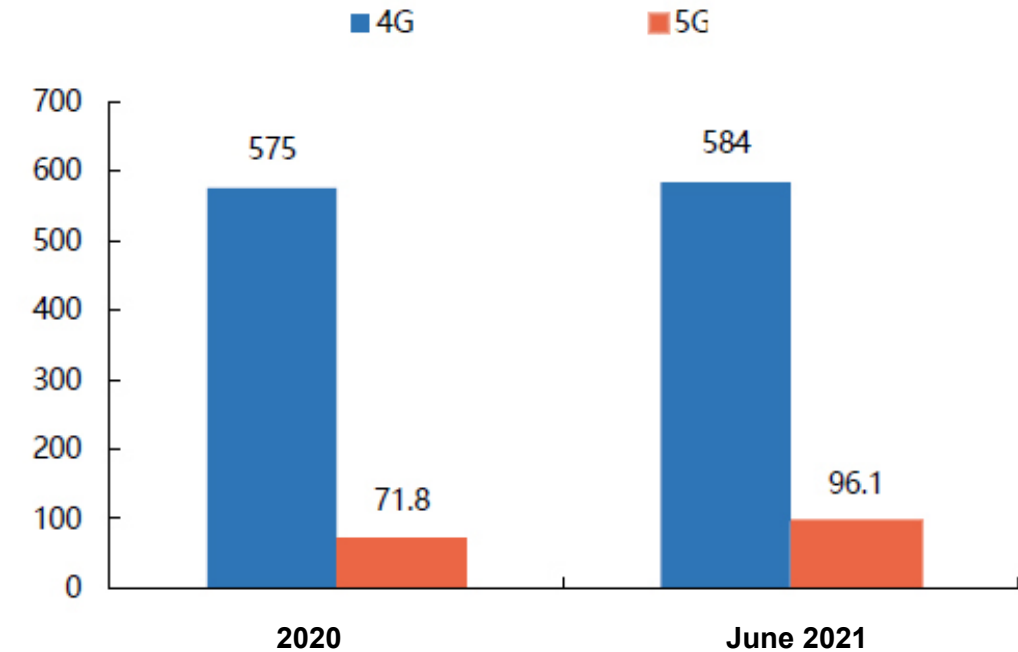


5G

Time delay upon receiving in ms



Number of Base stations in China (unit in 10,000)



5G Time delay upon receiving within 10 ms

Short delay or low friction is an essential requirement for AR/VR



- 1950 Giving intelligence to machine (Rule based)
- 1980 Machine learning, speech recognition, image recognition, playing go, dialogue
- 2006 Deep learning, higher prediction accuracy

- 2007 Li Fei Fei, ImageNet assembling a database of 14 million labelled imaged
- 2011 Microsoft explored Speech recognition and IBM's Watson
- 2014 Google acquired Deepmind, coming deep learning and reinforcement learning
- 2016 DeepMind's AlphaGo defeated world champion Lee Sedol



Vs

Lee Sedol

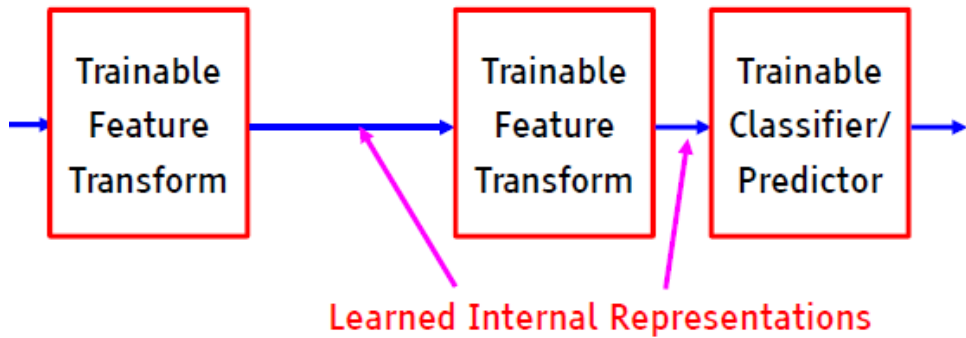
李世石



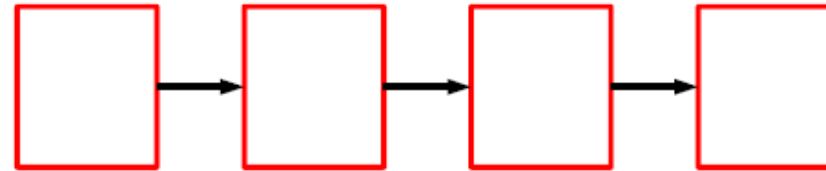


Features Extraction

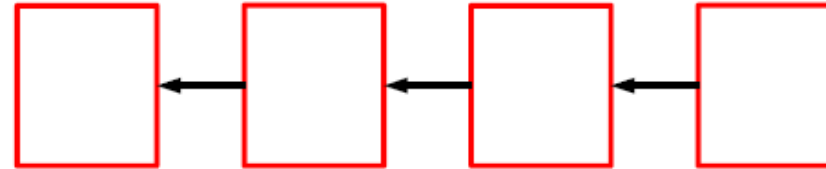
$$y = \text{sign} \left(\sum_{i=1}^N W_i F_i(X) + b \right)$$



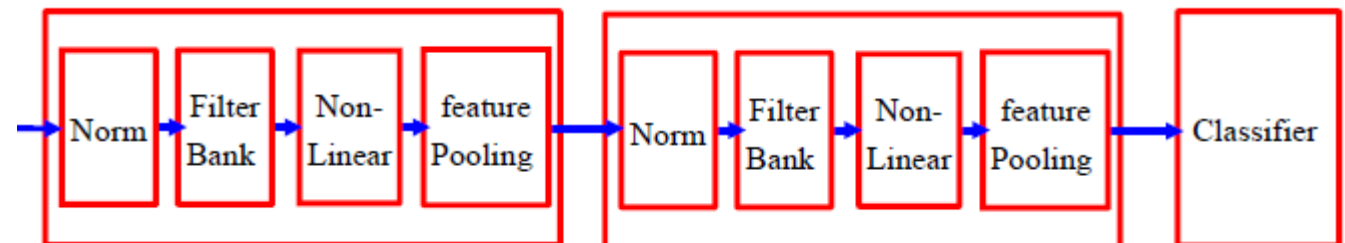
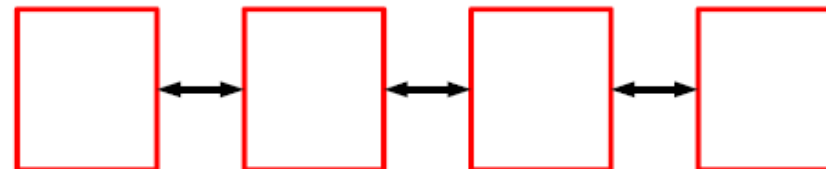
- Feed-Forward: multilayer neural nets, convolutional nets



- Feed-Back: Stacked Sparse Coding, Deconvolutional Nets



- Bi-Directional: Deep Boltzmann Machines, Stacked Auto-Encoders





AI

AI is required for computing vision, deep learning, natural language and smart phonetic for providing the required immersive experience for virtual world.

2021 Metahuman Creator tools for making a virtual 3D human face (in a shorter period)



2020 Live Link Face can capture human face into virtual world

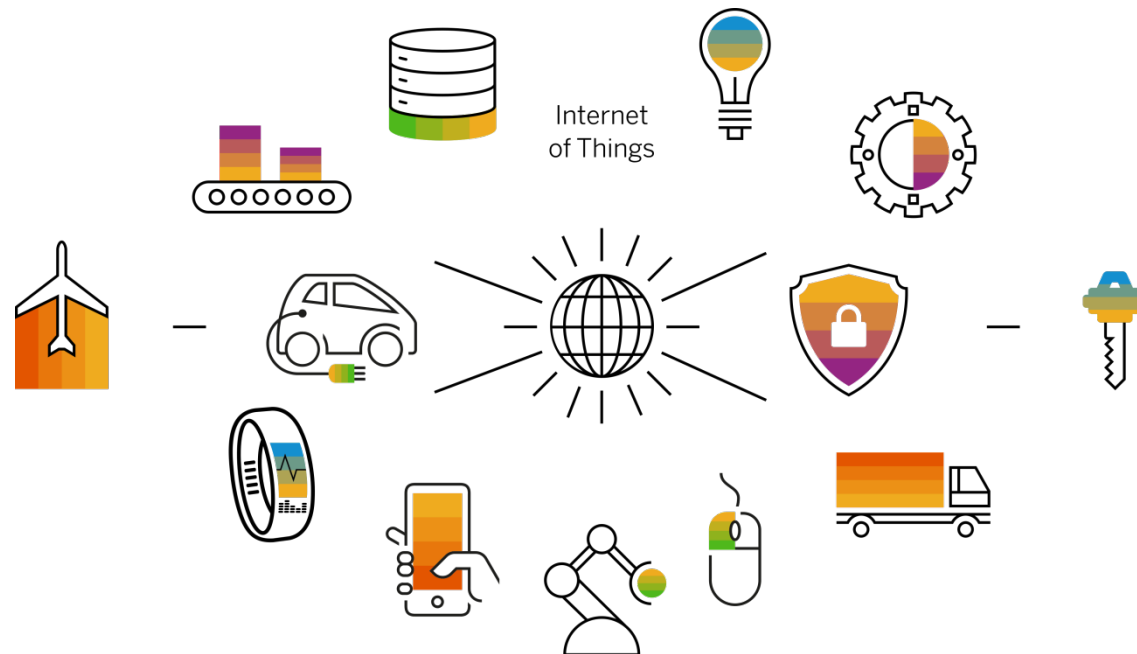


IoT Internet of Things

All devices can be connected and send the information, respond to information.

Main characteristics

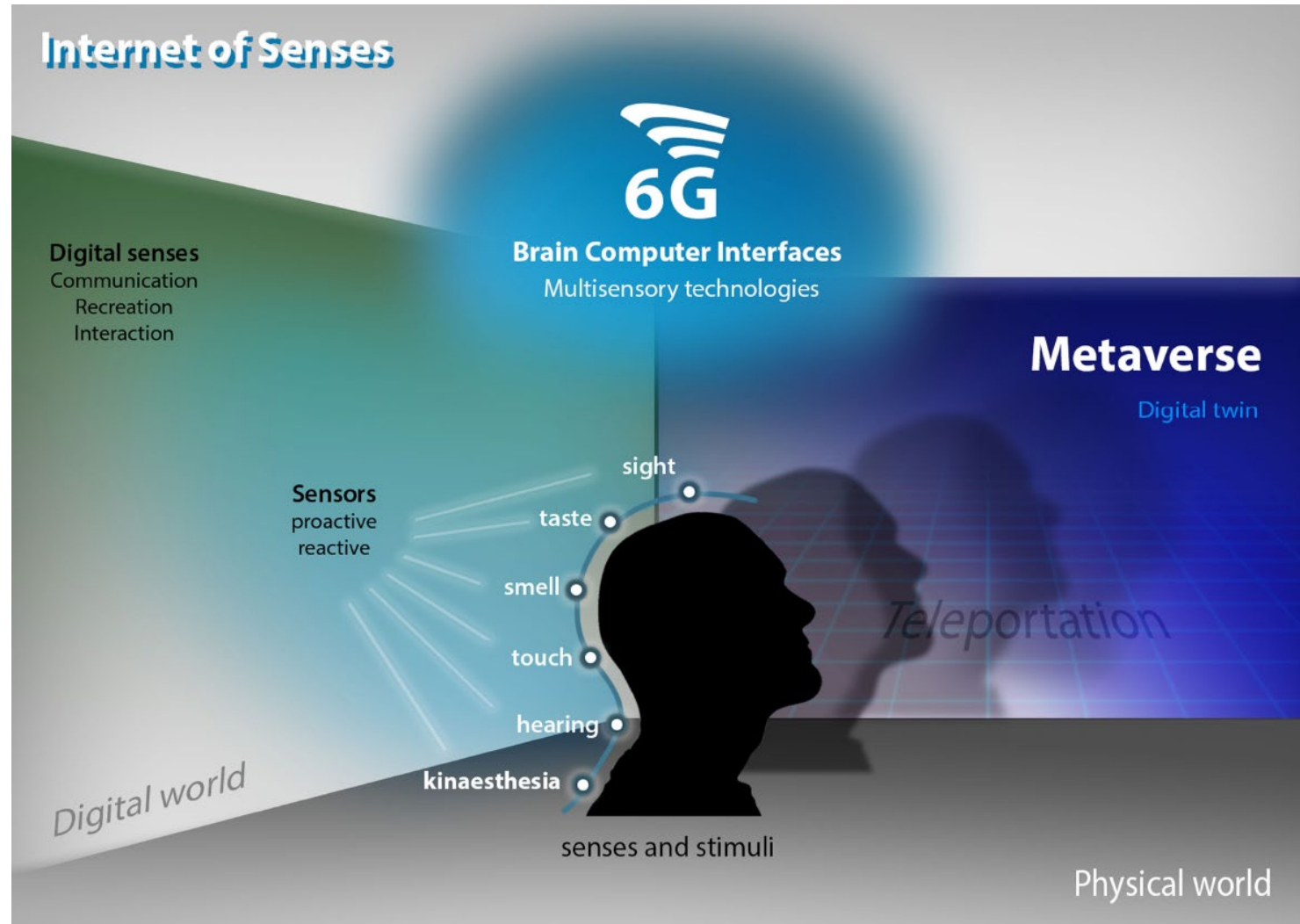
Intelligence, Connectivity, Sensing, Expressing, Energy, Safety





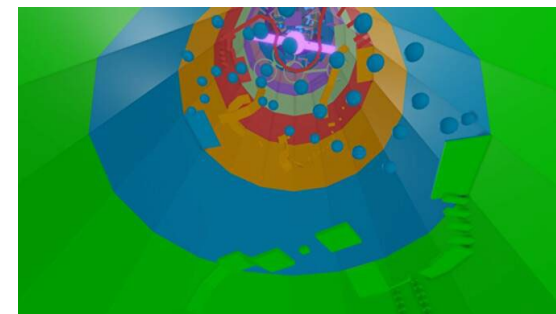
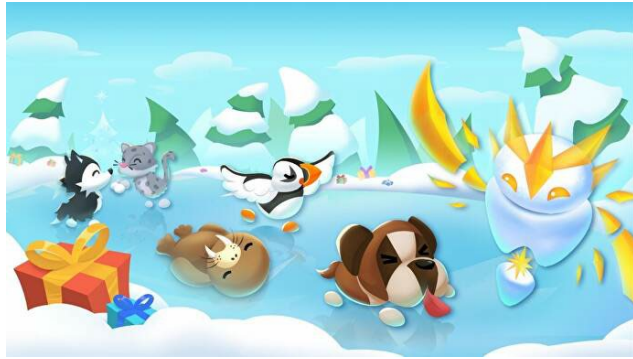
Internet of Senses

- Sight
- Taste
- Smell
- Touch
- Hearing
- Kinaesthesia



Knowing more about Metaverse 11. Game, Art & Culture

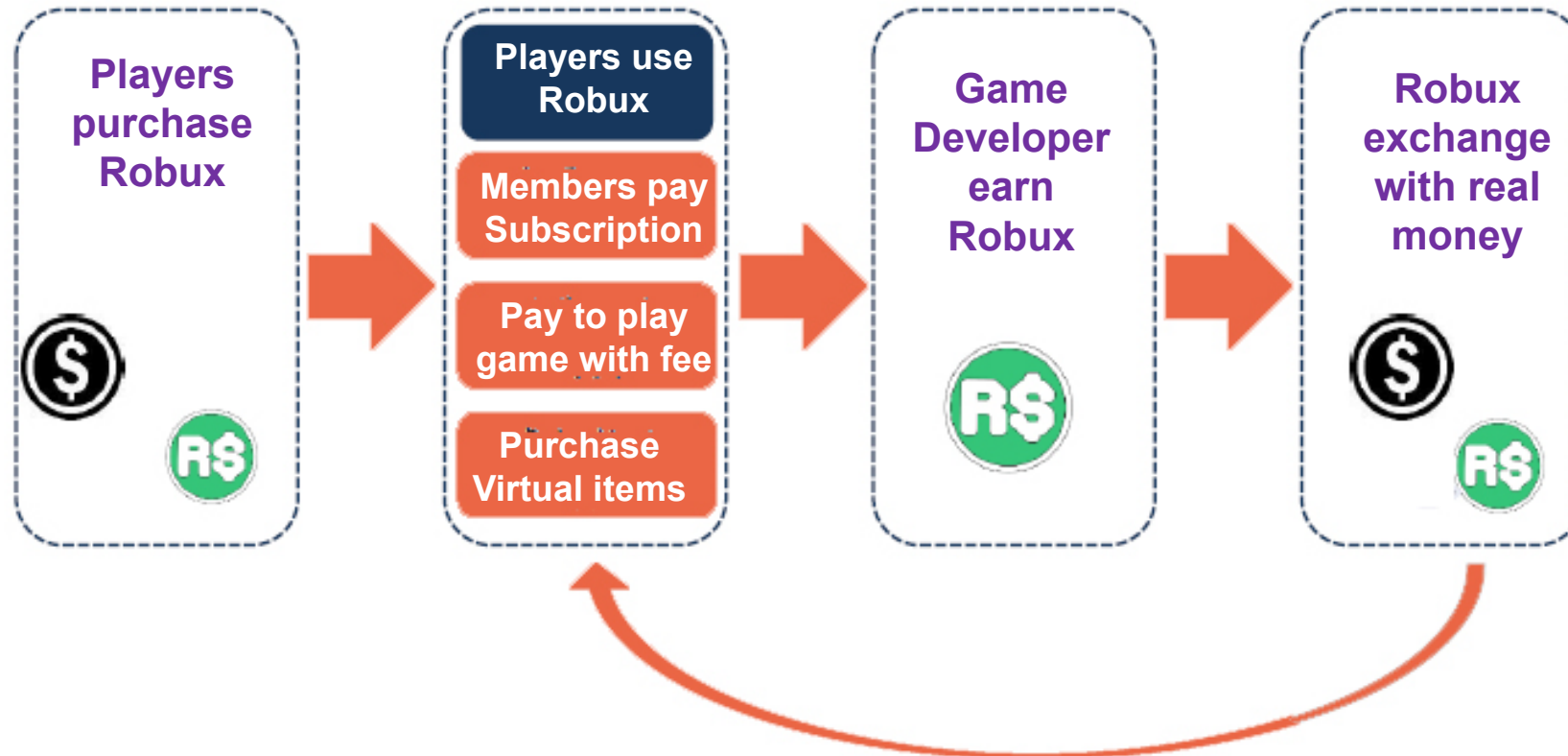
Roblox games



On-line game platform and game creation system, Robux is its virtual currency.

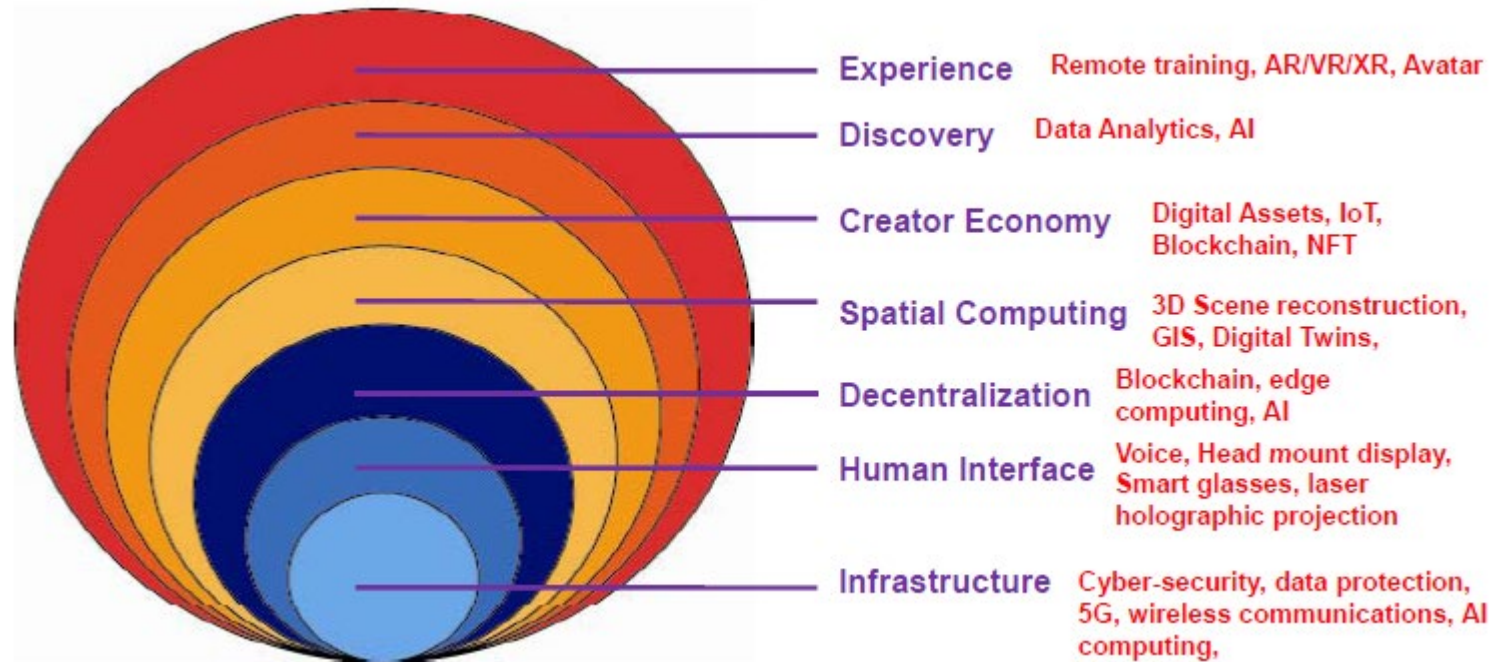


Roblox On-line game platform and game creation system, Robux is its virtual currency.





Roblox Corporation



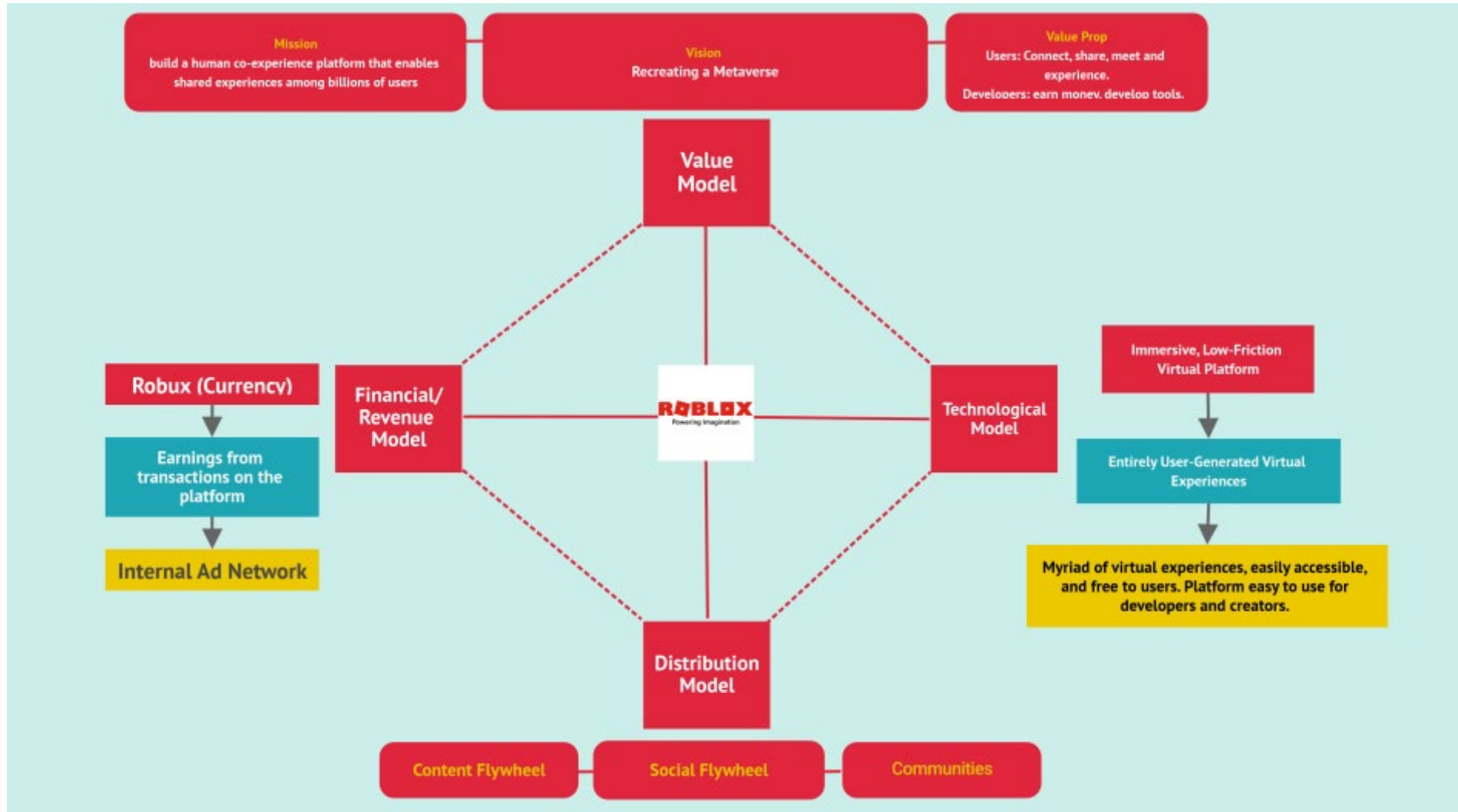
Eight key characteristics of Metaverse:

- Identity
- Friends
- Immersive
- Low Friction
- Variety
- Anywhere
- Economy
- Civility

From Share Perspective



Roblox Corporation



Game



Game – 6 arts

Rites, music, archery, chariot racing, calligraphy and mathematics



GameFi

GameFi is the combination of Gaming and Finance.

Game is not an entertainment, but a way to earn. (Vietnam)

NFT as a Service (NaaS) model

Web3, NFT and Blockchain Solution

Shoptifi: No coding knowledge

Naas platform

NFT blockchain, properties input in the Google form

Knowing more about Metaverse 12. Future Look



A Metaverse Conference



Metaverse

Co-existing of Real and Virtual World



In real world, facilitated learning required a space for gathering, aids for interactivity, members who contribute and a facilitator

In virtual world, it is characterised by simulated scene, boundless exchange, immersive experience and free co-creator



Metaverse

Web 3.0

Shopping

Dining with virtual figures, Avatar

Five senses: Eye, Ear, Nose, Tongue, Skin

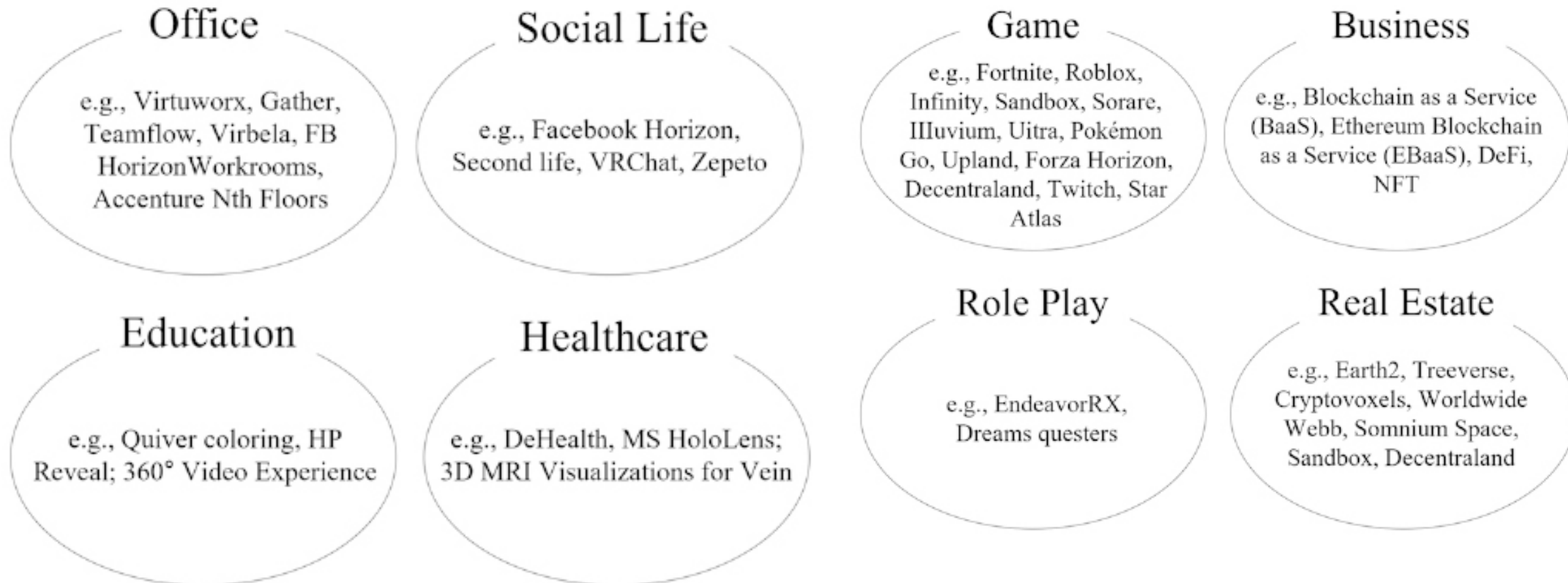
Electronic spoon

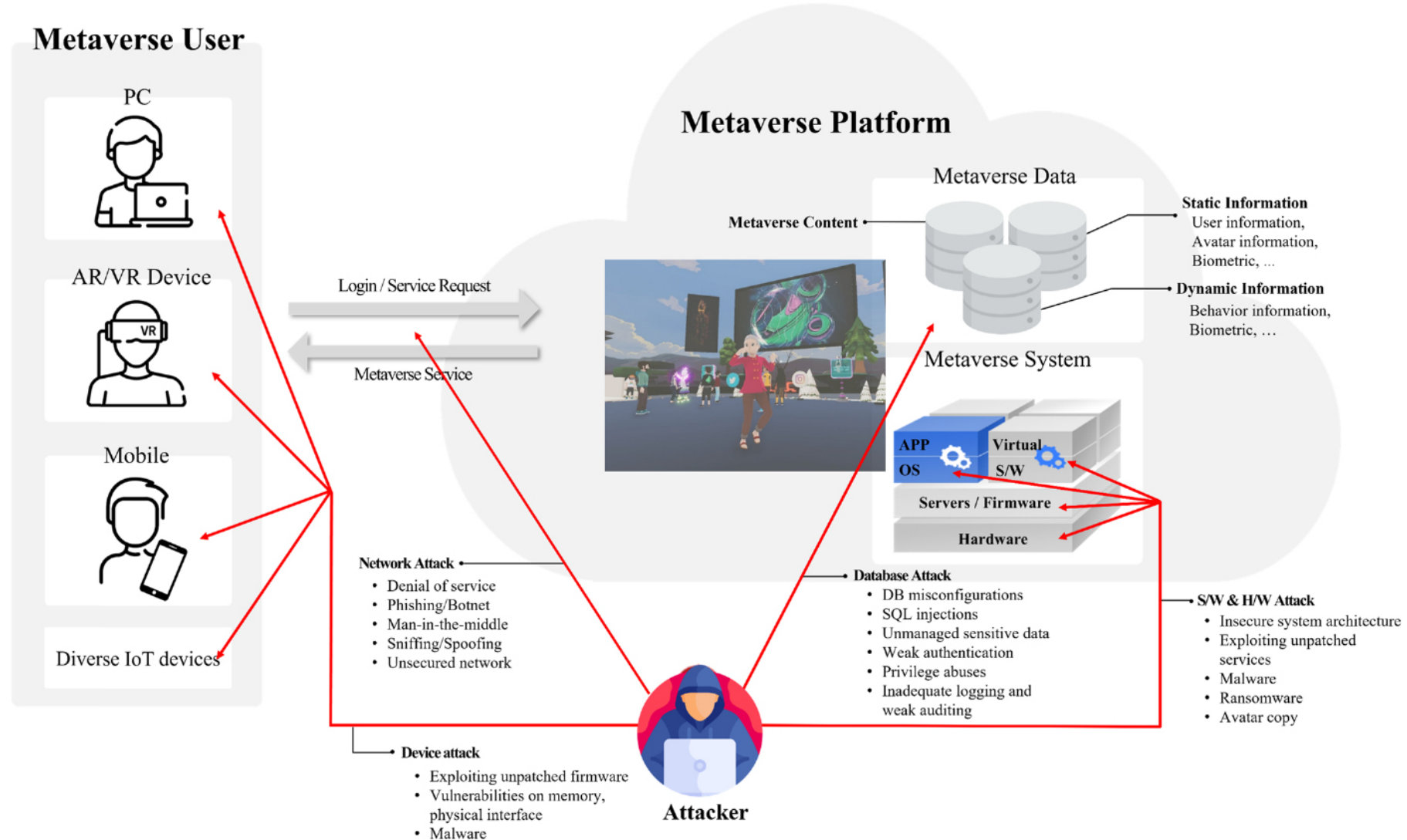
Unlimited immigration



Metaverse as a tool

Metaverse as a target





Metaverse Court

全國首場元宇宙庭審 廈門開庭

2022-10-10 16:17



全國首場元宇宙庭審，在廈門開庭。

為維護法庭秩序及庭審安全性，元宇宙庭審採用密碼入庭的身分核實方法，同時，由法庭後台統一管理發言權限及投票權限。



元宇宙庭審畫面。



Metaverse Asia Expo 2022

Metaverse Asia Expo 2022
17 OCT - 21 OCT 2022
METaverse

Co-Organizers
GG ASIA CEO COMMUNITY GBX 经贸交流

Event Management
GREAT META

Metaverse Asia Expo 2022



Auditorium

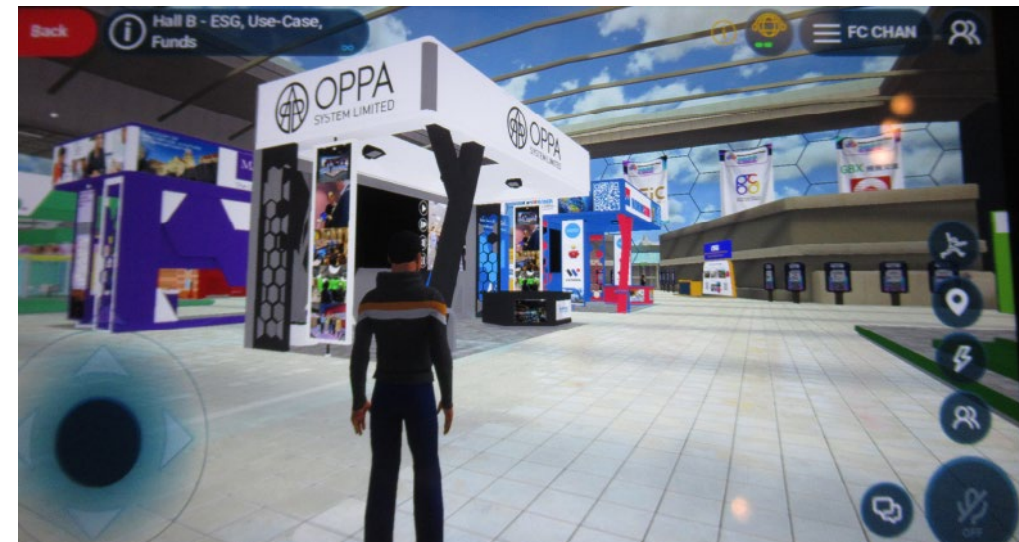


Exhibition Booth

Knowing more about Metaverse



Metaverse Asia Expo 2022 Exhibition



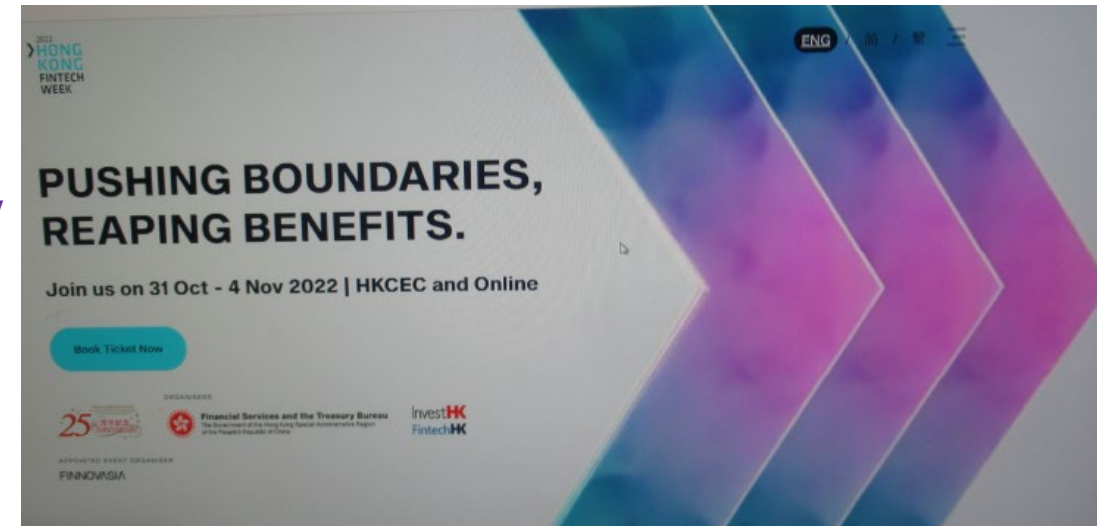
FinTech Week 2022

31 Oct to 4 Nov 2022

Pushing Boundaries, Reaping Benefits

A gathering of global leaders in innovation, technology and finance.

Organised by the Financial Services and Treasury
Bureau, HKSAR
With 250 speakers.



To support the emerging technologies Web3 and the metaverse as a focus of this year's event, we will issue non-fungible tokens for the first time to test their ability to engage participants.

At the same time, the Government will issue a policy statement on the development of virtual assets in Hong Kong, demonstrating to the global virtual assets community our vision of developing Hong Kong into an international virtual assets centre!



Metaverse

What is Metaverse?

Technologies: 5G, AI, Big Data, Block Chain, NFT

Web 3.0

Decentralization

VR Tools

Infrastructure

Game, art and culture



Life Long Learning

L EARN

Knowing More About Metaverse

認識元宇宙

by
Ir Dr FC Chan

Questions and Answers