SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Category - I Deemed to be University) Porur, Chennai
SRI RAMACHANDRA ENGINEERING AND TECHNOLOGY

CSE-430 Design Thinking

CA4 REPORT - METAVERSE

Submitted to

SRI RAMACHANDRA INSTITUTE OF HIGHER EDUCATION AND RESEARCH

SRI RAMACHANDRA ENGINEERING AND TECHNOLOGY

For the Award of the Degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

(Cyber Security and Internet of Things)

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TABLE OF CONTENTS

METAVERSE - INTRODUCTION

Introducing the Metaverse:

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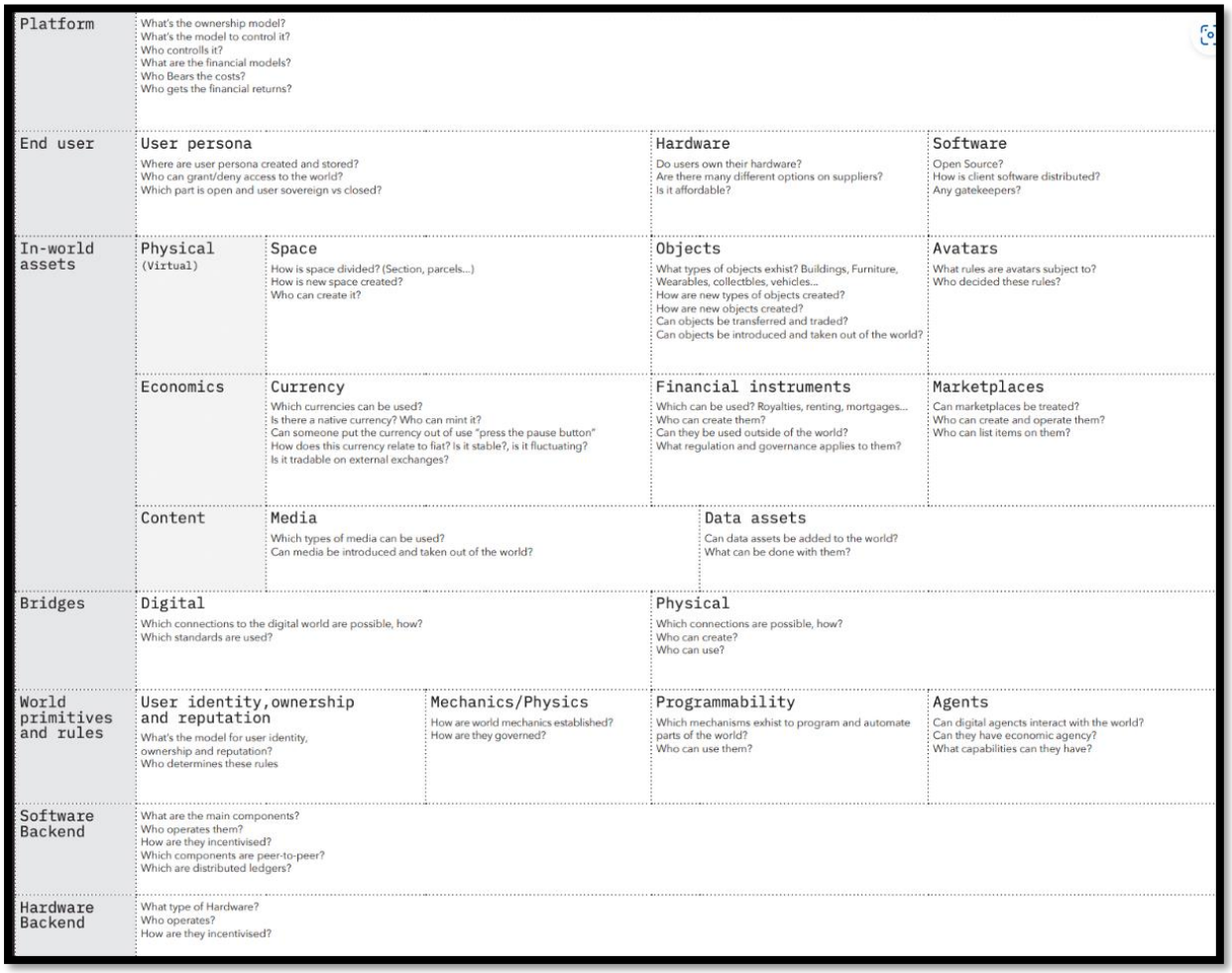
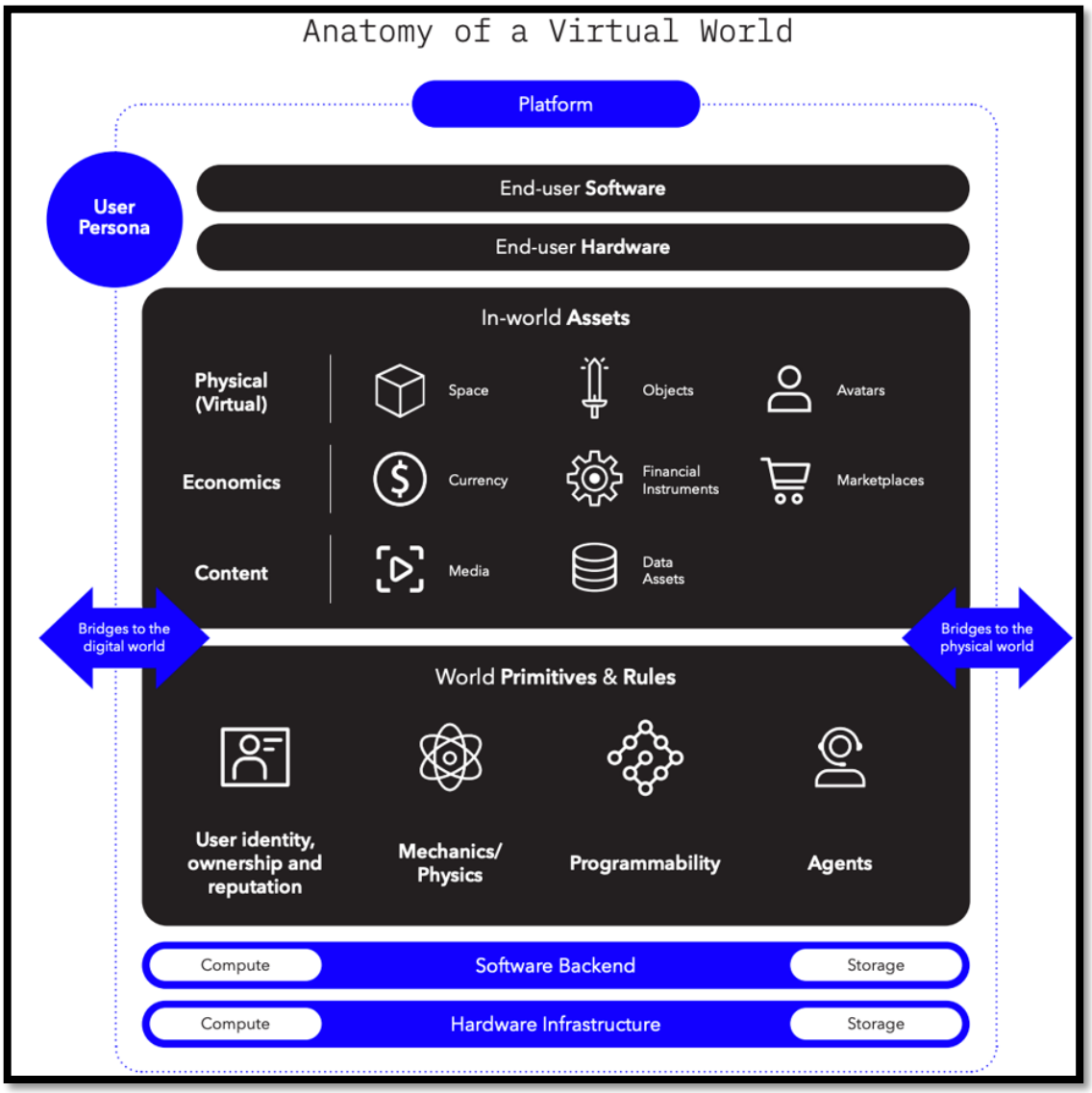
However, only a few of them allow you to transact in and out of their closed platform using fiat, and wealth is not directly transferable between these microeconomics into a virtual meta economy with its own sovereign currencies.

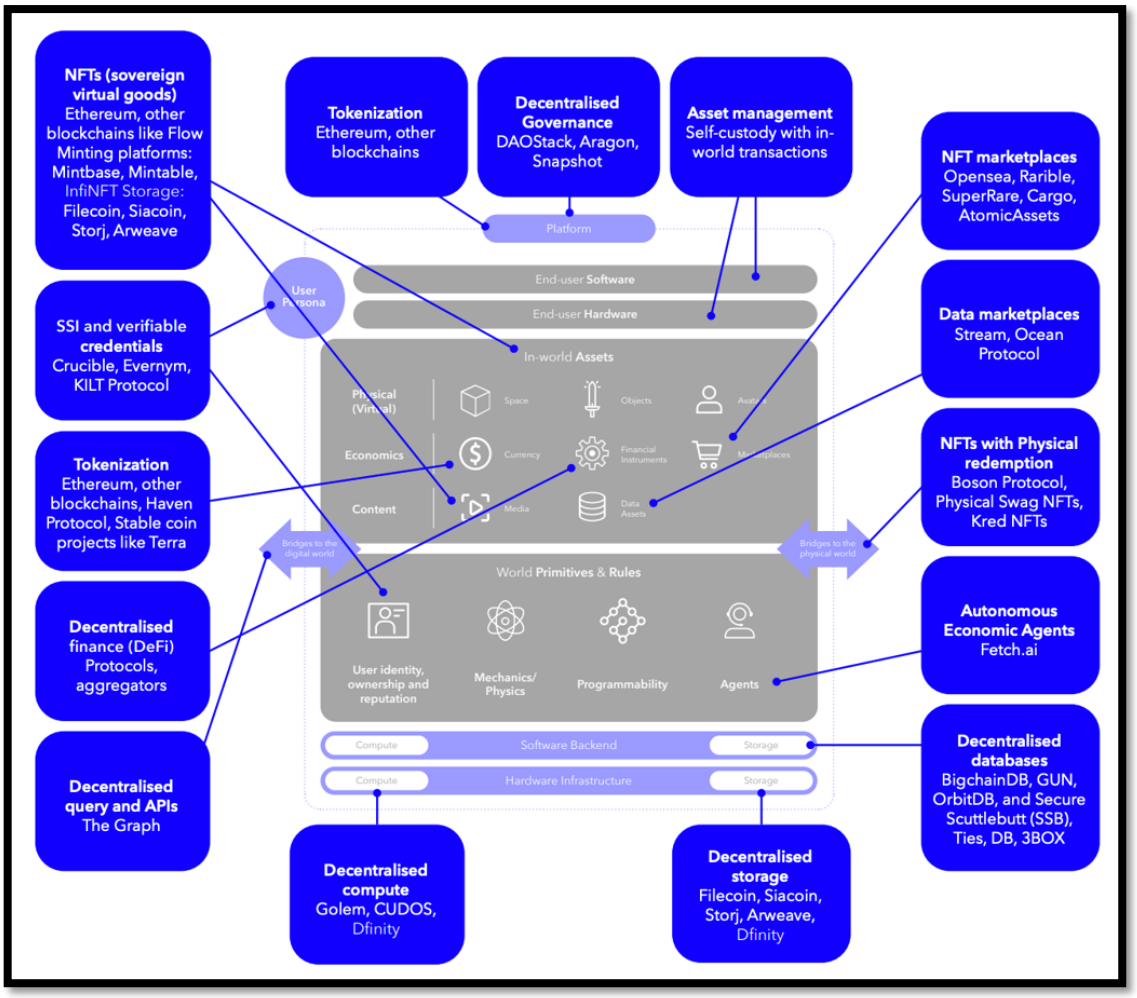
Furthermore, you can't generally borrow against virtual wealth to buy physical assets, putting digital natives at a disadvantage in an economy where 63% of gamers said they would spend more on skins if they had real-world value.

We believe that the defining feature of a true Metaverse is the need for its own economy and currencies, where value can be earned, spent, lent, borrowed, or invested interchangeably in both a physical and virtual sense, and most importantly, without the need for a government.

Above are web 3 tools used for metaverse:




Anatomy of a Virtual World
Platform
User Persona
End-user Software
End-user Hardware
In-world Assets
Physical (Virtual)
Space
Objects
Avatars
Economics
Currency
Financial Instruments
Marketplaces
Content
Media
Data Assets
Bridges to the digital world
Bridges to the physical world
World Primitives & Rules
User identity, ownership and reputation
Mechanics/ Physics
Programmability
Agents
Compute
Software Backend
Storage
Compute
Hardware Infrastructure
Storage


NFTs (sovereign virtual goods)
Ethereum, other blockchains like Flow
Minting platforms: Mintbase, Mintable,
InfiNFT Storage:
Filecoin, Siacoin, Storj, Arweave
SSI and verifiable credentials
Crucible, Evernym, KILT Protocol
Tokenization
Ethereum, other blockchains, Haven Protocol, Stable coin projects like Terra
Decentralised finance (DeFi)
Protocols, aggregators
Decentralised query and APIs
The Graph
Tokenization
Ethereum, other blockchains
Decentralised Governance
DAOStack, Aragon, Snapshot
Asset management
Self-custody with in-world transactions
Platform
User Persona
End-user Software
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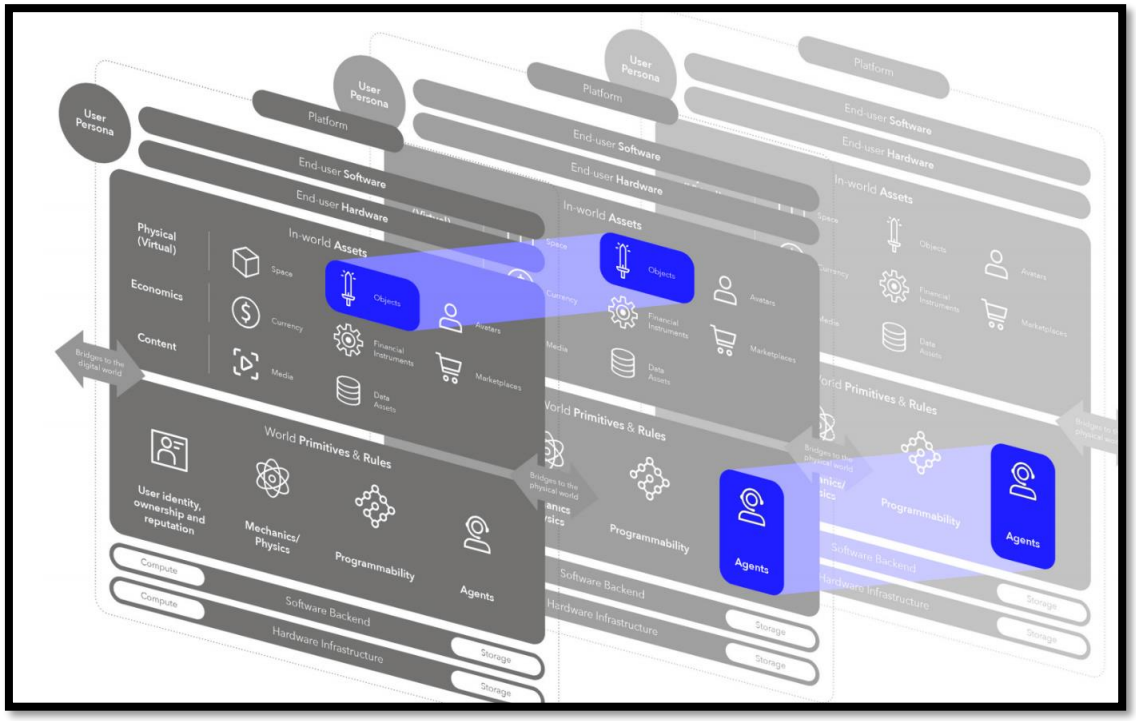
Decentralised storage
Filecoin, Siacoin, Storj, Arweave, Dfinity
NFT marketplaces
Opensea, Rarible, SuperRare, Cargo, AtomicAssets
Data marketplaces
Stream, Ocean Protocol
NFTs with Physical redemption
Boson Protocol, Physical Swag NFTs, Kred NFTs
Autonomous Economic Agents
Fetch.ai
Decentralised databases
BigchainDB, GUN, OrbitDB, and Secure Scuttlebutt (SSB), Ties, DB, 3BOX



CHAPTER-1 EMPATHIZE

Needs finding:

The original vision and definition of The Metaverse was a point in time when the distinction between physical and digital becomes blurred. This has typically been considered in the context of AR (Augmented Reality) and VR (Virtual Reality), also known as Mixed Reality, becoming more prevalent.

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User interviews:

1. There is a lot of buzz surrounding the metaverse. What are your thoughts on hype vs. reality?

All research indicates that hype and reality are not in sync. FOMO takes precedence over feasibility. Nearly 34 percent of B2C marketing executives in the United States have made (or plan to make) investments in the metaverse, but only about 13 percent of consumers are excited about it or believe it will be "good for society."

Companies are under a lot of pressure to prove their worth. Right now, the metaverse is an intangible concept. They must provide and demonstrate to the average person how the metaverse will improve their daily lives.

XR is not the metaverse in and of itself. Roblox is not the metaverse in and of itself. XR and Roblox are two media-hyped "metaverse" activations, but we don't believe the true metaverse exists today. To be truly realised, it requires interoperability so that assets, belongings, and identities can be transferred from one platform to another.

We believe that the metaverse will emerge in stages over the next decade and beyond.

2. **Should brands put off investing in the metaverse?**

We believe brands should take advantage of this time to test and learn, as long as investments and expectations are kept in check.

It makes sense to understand how a consumer base interacts with immersive technology. It is also an excellent time to develop future use cases for when the metaverse is realized.

3. What kinds of experiences do you see emerging once we've solved interoperability?

The metaverse should be viewed as a 3D experience layer of the internet. As elements of the metaverse enter the physical world, we will eventually live in a physical/digital hybrid reality.

As society begins to value digital goods and services more broadly, there will be a much greater opportunity for brands to engage in immersive worlds. Today, we see strong economies in gaming environments, but if the metaverse turns out to be what we expect, there will be more opportunities to create branded experiences.

Brands must approach all of this with an innovative mindset and ask the critical question, "How can I improve the user experience within a brand
given platform?'

4. In regard to interoperability What are the circumstances under which this will occur?

It's impossible to say. Some of the major companies currently developing their own slice of the metaverse (for example, Meta, Epic Games, and Microsoft) are beginning to collaborate. Given their level of investment, this action gives us reason to be optimistic about the possibility of interoperability.

Under Armor is an example of a brand that is doing something similar today. They launched an NFT for one of Steph Curry's sneakers, in which holders received virtual sneakers that could be worn across three different immersive platforms (Gala Games, The Sandbox, and Decentral and).

5. What are the questions that brands ask themselves before venturing into the metaverse?

Before investing in the metaverse, all brands should consider four questions.

1. Do I have a well-defined metaverse business goal?

FOMO is causing brands to rush to join the metaverse bandwagon, and they're cutting corners in the process. As a result, there are a lot of mediocre activations. First and foremost, determine WHY you want to activate in the metaverse and plan your strategy accordingly.

2. Is my target audience interacting with XR today?

How is your audience currently engaging with these 3D experiences, whether through AR, VR, or Mixed-Reality? Are they expected to use more XR technology? Could they see value in the future if they aren't using it now? Otherwise, activating it today would be a waste of resources.
3. Have I chosen a platform partner with the potential for growth and scale?

Remember that, aside from Roblox and Fortnite, most "metaverse" platforms today have a small user base. To put this in context, Decentral and has just under 500k monthly active users, whereas Roblox has approximately 55 million daily users. The partners you work with are determined by the types of audiences you want to reach as a brand.

4. Does my brand activation enhance the overall experience?

People dislike advertisements. They also dislike being interrupted online. Your brand activation should be relevant to the audience, respectful of the community, and add to the overall experience. That is a difficult obstacle to overcome because it necessitates breakthrough creativity and innovation.
Your brand is distinguished by its creativity. It's a waste of time for everyone involved if your experience isn't unique (and valuable, of course).

Observation:

Following Facebook's rebranding as Meta, reflecting its focus on the "metaverse," Microsoft has now announced that it, too, will enter this space.

Meta has proposed that the metaverse will eventually allow us to engage across education, work, and social contexts, whereas Microsoft appears to be focusing solely on the virtual office for the time being.

But what exactly is the metaverse, and how much should we believe that the vision being presented to us will be central to our daily lives?

The concept itself is not novel. In his 1992 cyberpunk novel Snow Crash, science fiction author Neal Stephenson coined the term "metaverse," describing a 3D virtual world in which people, represented as avatars, could interact with one another and artificially intelligent agents.

Many people have attempted to stamp their own definitions on the metaverse, as with any large vision of a future that does not yet exist. If you're unfamiliar with the concept, it might help to understand some of the properties you can expect from the metaverse

1. A virtual world: In my opinion, this is the most important feature of a metaverse. You could explore it on a computer, gaming console, mobile device, wearable technology, or other device, interacting with 3D graphics and sound along the way. The idea is that by doing so, you will feel more present in the metaverse and, presumably, less present in the real world (where your body stubbornly remains).

2. Virtual reality (VR). A virtual reality headset is required for this. The idea is that you become immersed in the virtual world, making you feel even more present - at least until you come across something that is still in the real world, such as a coffee table.

3. Other individuals. The metaverse is a social place. There are a lot of other people there as avatars. Some of these avatars could be bots, virtual agents, or artificial intelligence manifestations. You can socialise with others and even do things together. Given Facebook's history as a social network, the social aspect is likely to be central in its metaverse.

Some fans and researchers believe that communication in the metaverse is more natural than video conferencing because, for example, you can use gaze to show who you are addressing (your avatar can turn its head to look at another person). You could also walk over to someone else's avatar and sit next to them to start a conversation.

4. Perseverance. This means that you can visit the virtual world whenever you want. You can change it by adding new virtual buildings or other objects, and the changes are remembered the next time you visit. You might be able to move in and own a piece of it. The metaverse, like social media, will rely on user-generated content - your digital creations and personal stories.

5. Relationship with the outside world. In some metaverse visions, virtual stuff in the virtual world represents real stuff in the real world. For example, you could use a virtual drone in the metaverse to pilot a real-world drone. People refer to the real and virtual worlds as "digital twins."

The Metaverse in Persona Development A universe of possibilities. A thrilling and exciting world. It's also a world full of enormous economic opportunities. The Metaverse market could reach $800 billion in the next five years, according to Bloomberg Intelligence.

By the end of the decade, that figure could rise to $2.5 trillion globally.

This market will undoubtedly include social networking, gaming, and other entertainment-related activities. That, however, only scratches the surface of what this technology is capable of. In reality, the Metaverse has a lot of potential for various applications.

Healthcare

The Metaverse Roadmap identifies four distinct technologies that comprise the Metaverse: lifelogging, mirror world, virtual reality, and augmented reality.

The last one has already made waves in the medical field. A research team in Seoul, for example, created a spinal surgery platform that allows them to perform procedures using an augmented reality headset.

The system displays a three-dimensional image of the patient's spine in the surgeon's field of view. This allows for more precise procedures and may even aid in the training of new surgeons.

Property Management

AR and VR provide new opportunities for real estate agents to sell homes.

A potential homebuyer, for example, could put on an AR headset and "walk" through the property without ever entering it.

This would be especially useful for people buying houses without seeing them first (like celebrities or the ultra-wealthy).

There's also the new virtual real estate market to consider. The Sandbox, for example, is a Blockchain-based game that allows users to purchase parcels of Metaverse land for as little as 1 ETH.

Sports stars, venture capitalists, and celebrities such as Snoop Dogg have all purchased land in The Sandbox. As a result, it is obvious that there is a market for virtual real estate.

Education

The pandemic has affected approximately 9 out of 10 students worldwide. However, both teachers and students are now adjusting to a new style of remote learning.

And the Metaverse can help with that. VR could, for example, be used to create simulations for field-based learning. Students would be able to experience different environments without having to leave the classroom.

Manufacturing

You are currently training employees from several companies on how to use, maintain, and repair equipment using VR headsets.Training JetBlue technicians on real planes, for example, would be not only costly and complicated, but also potentially dangerous. The company employs headsets in collaboration with Strive, a maker of VR software.

This type of training has even been used by the US military. In fact, the Army Research Laboratory is investigating the use of virtual reality to teach soldiers how to identify and disarm improvised explosive devices.

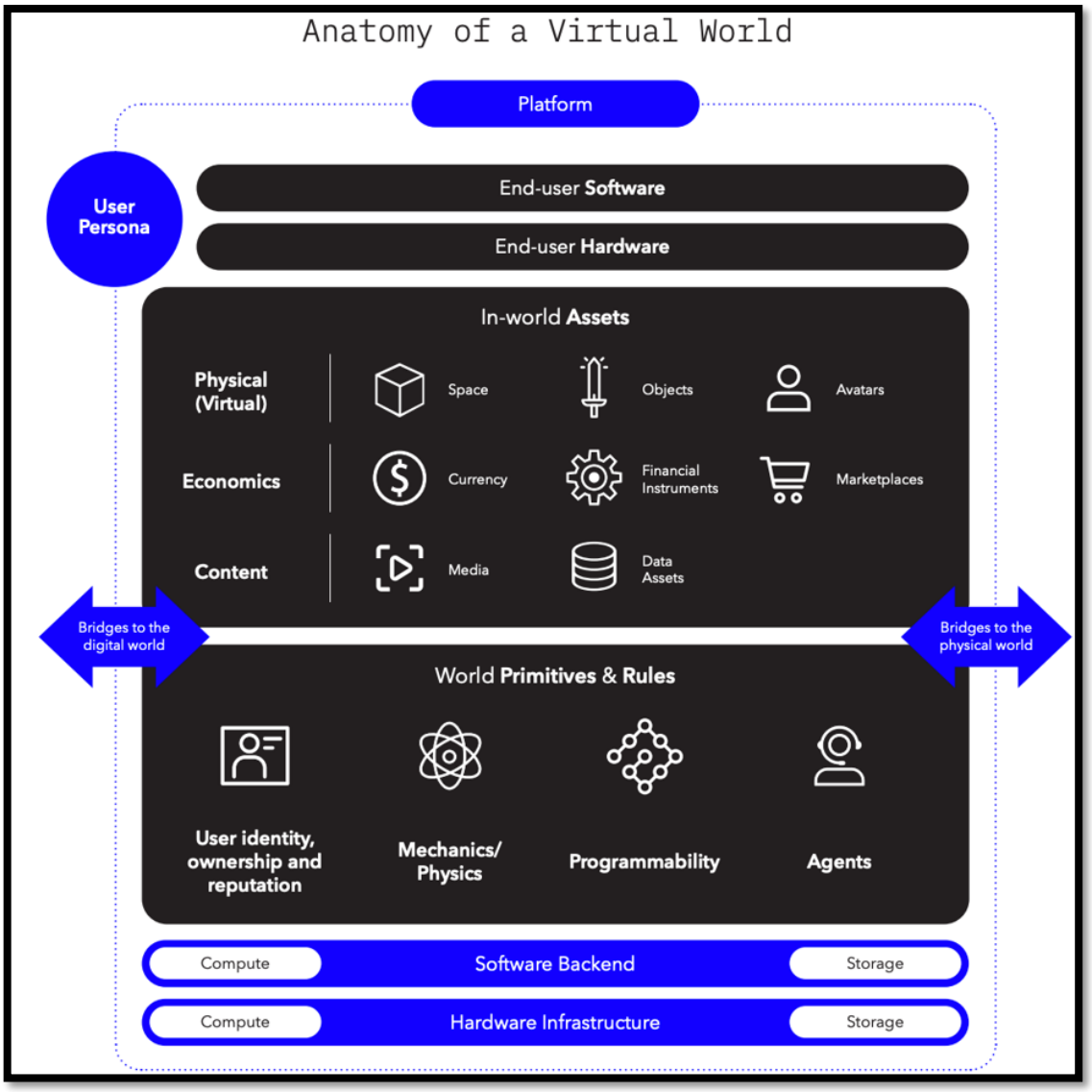
Gaming:

In the metaverse, interactive gaming and various types of 3D games can be played, attracting a large number of web gamers.The Metaverse is a system that combines social networking, online gaming, virtual reality, augmented reality, and cryptocurrency to allow users to interact digitally. Players who were previously interested in other online game genres, such as multiplayer games, are frequently shifting their focus to the Metaverse. In the future, the Metaverse is very likely to facilitate corporate meetings, trainings, online entertainment, and possibly web-based learning.

Gaming companies, tech titans, and venture capitalists have all made significant investments in the metaverse. Decentral and was one of the first companies to try to build a metaverse for multiplayer gaming. Sandbox is a video game that allows you to play, create, own, and govern a virtual space. And Epic Games is best known for Fortnite, a virtual reality game and event destination in one.

The metaverse gaming industry allows you to not only play games but also earn money. There are many games to play in Metaverse games that have been launched by various gaming titans and pay you in NFTs. Axis Infinity has become a major source of income for gamers; it is an RPG game that allows players to trade NFTs on its platform; others include Alien Worlds, Splinter lands, Farmers World, and so on. Players can engage in profitable activities in addition to following linear storytelling and rules.

Listing the needs according to priority:



Needs for implementation of metaverse:

1. Choose the proper use case of a metaverse.
2. Create the user interface for your platform.
3. Code operational smart contracts.
4. Create the IPFS storage system.
5. Making a metaverse database.
6. Develop the core AI and VR functionalities
7. Integrate smart contracts, IPFS, front end, and back end.
8. Move to the test phase and make sure the platform is bug-free.
9. Release the beta version of the platform.
10. Deployment of metaverse platform.

CHAPTER-2 DEFINE PHASE

(i) Problem Framing

Technically speaking, the original concept and definition of The Metaverse was a moment in time when the line between the real world and the digital world blurs. This has often been discussed in relation to the spread of mixed reality, also known as augmented reality and virtual reality.

However, we think it's crucial to view it as a process or journey rather than a final goal.This is due to the fact that we must recognise the Metaverse's beginnings are already in place; otherwise, we risk ignoring certain crucial design considerations and perhaps replicating or worsening the problems with the current Web.

It appears that one of the distinguishing features of a metaverse was that it had a distinct economic system that predominated over the previous fiat-based economies run by nation governments.

Because Facebook is a highly centralised, fiat-based organisation, its efforts to introduce Libra, which would have also applied to Oculus, as its own digital currency, have been vigorously restrained and, as a result, effectively neutralised.

It might be argued that some video gaming platforms are so large that they are closed micro-economies with their own currencies that they centrally manage and value systems, such as experience point systems, in-game products (skins), and marketplaces, where considerable sums of money are kept and sold.

But in practise, few few closed platforms even allow fiat transactions, and even more significantly, money cannot be transferred straight from these microeconomics into a fictitious meta economy with its own sovereign currencies.

Furthermore, it's uncommon for people to borrow money against their virtual assets to purchase tangible goods, which places digital natives at a financial disadvantage. In fact, 63% of gamers claimed they would actually spend more on skins if they had real-world worth.

In the end, we argue that a true Metaverse must have its own economy and native currencies, where value may be earned, spent, lent, borrowed, or invested interchangeably in both the real and virtual worlds, and most significantly, without the need for a central authority.

COMPETING METAVERSE

We begin by comparing the two growing versions of The Metaverse: one dominated by closed platforms and Big Tech, such as Facebook and Oculus, and the other built on open protocols and utilising blockchains, such as Decentraland. Where the level of comparative openness may be evaluated;

How much a platform embraces open source principles with their code and data, how closed a virtual economy is (within / across their proprietary games)

The extent they control the monetary & fiscal policy of underlying economy, how it interacts with fiat based systems, If they allow transferability of value outside their ecosystem.

In order to be as inclusive and to get as many people out of the old economy and into The Open Metaverse as possible, we also think there is a Low-fi vs. Hi-Fi spectrum depending on the gear needed to enjoy a virtual environment.

(ii) Identify problems

1) Finding right tech stack

The digital platform called Metaverse will be the best—if not the most difficult—that people have ever created. Although the idea of a virtual world is fascinating, Ready Player One neglects to address the GDPR (General Data Protection Regulation), user permission for tracking cookies, and lengthy terms and conditions that no one would ever care to read. Any fantasy book would seem a little underwhelming if it spent an entire chapter detailing how the virtual world experience complies with GDPR guidelines. It won't take much imagination to realise what a nightmare developing the experience architecture for such a platform will be.

2) The niche demand is simply not for everyone.

- Can we actually transform these demands into a universally accessible, future digital VR/AR platform?
- Why all of a sudden, does it seem to be okay to turn a unique demand we can only find with gamers into a gigantic digital platform?
- Can this gap between a gamer's imagination and the desire for a futuristic, all-inclusive digital platform—which hasn't been confirmed because it's all still just a theory—really be closed by VR/AR technology?

The procedure must go smoothly and be sensitive to the demands of the user. Designers may frequently step in and make a difference in this situation. The risk of converting the Metaverse into something that people don't want can be reduced by designers turning those specific user demands into concrete services and goods. We must create features that make sense to both the user need and the Metaverse ecosystem in order to close the gap between them. Making technology easier for people to use is one of the distinctive values of design.

The danger is not limited to the platform itself. Businesses would not be able to afford not to be on the platform if Metaverse proves to be successful since they face the danger of having their rivals steal all of their clients without a battle. In that situation, such companies should research what the Metaverse platform's users desire from their offerings. Another usual task for designers is this one.

Due of their extensive toolkit for doing user research, designers can move quickly. To get around the level of uncertainty the new platform introduces might be quite useful.

(iii) Stakeholder analysis

The acceptance of new technology by adopter personas is broken down into the technology adoption life cycle. In his book Diffusion of Innovations, Everett Rogers lists five factors that might affect the adoption of a new concept or technology. One of these factors is the existence of adopters. He divided individuals into five categories according on how quickly they embraced new technologies.:

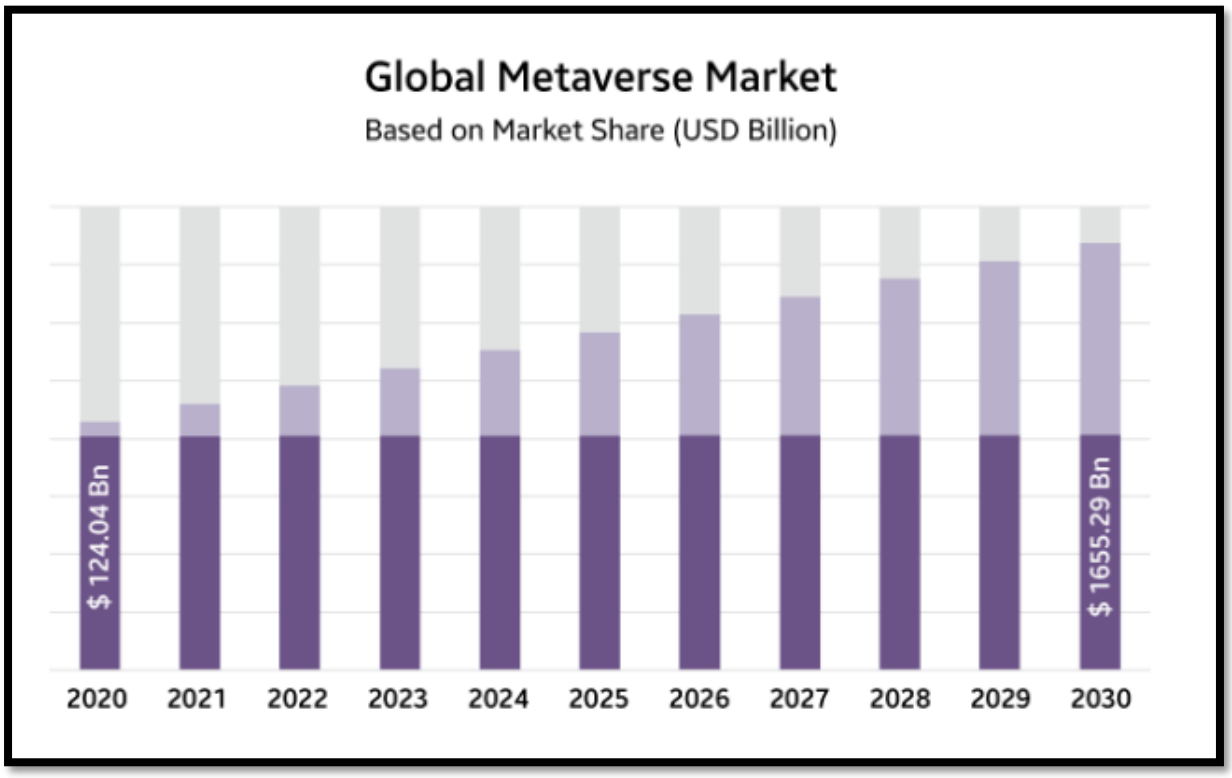
1. **Innovators** are, at 2.5%, the smallest market group, yet their reviews persuade people to learn more about the product. These "techies" frequently have extensive knowledge of new technology and the means to attempt novel ideas, even if they don't work.
2. **Early adopters** are picky about the technology they first begin to use. These tech-savvy clients are drawn to the technology because of its advantages. By embracing something, they frequently lessen other people's confusion about that technology. Others check in with them for information about new technology.
3. **Early-majority** The majority of buyers are willing to wait since they don't want to be duped by trends. However, if a product is useful or compatible with their lives, it results in adoption. About 34% of the market is made up of them.
4. **Late-majority** Buyers seek proof that the technology is widely used and that all of the flaws have been resolved. Emerging conventions, peer pressure, or need all influence their adoption. Similar to the early majority, this market sector represents roughly 34% of the total market..
5. **Laggards** are the final group of people who are conservative and unwilling to experiment with new concepts or technologies. This market sector, which makes up around 16% of the total, only adopts when necessary.

(iv) Market Analysis - Industry Report and Statistics

Users of Metaverse may virtually interact with people no matter how far off they are from one another. It gives users access to a platform with an immersive experience that improves online social interactions and offers many other benefits outside of social media. It enhances a variety of things, including online education, gaming, the usage of cryptocurrencies and NFTs, as well as the working environment.

In addition, it is anticipated that Metaverse would be able to support emerging firms and offer enormous potential for financial growth in the future. Additionally, the introduction of IoT in the metaverse has aided in overcoming one of its formidable difficulties, namely the transfer of data from the actual world to the virtual one. There is little question that Metaverse will need extremely complex IoT designs, such as cloud computing, network architecture, etc.

According to SMR's study, IoT technologies have been embraced by over 84% of companies globally, and the number of IoT-connected devices is expected to increase by almost 18% (or around 14.41 billion) by 2022 compared to the previous year. Future expansion of the metaverse market is anticipated to be aided by all of the aforementioned considerations.



CHAPTER-3 IDEATE

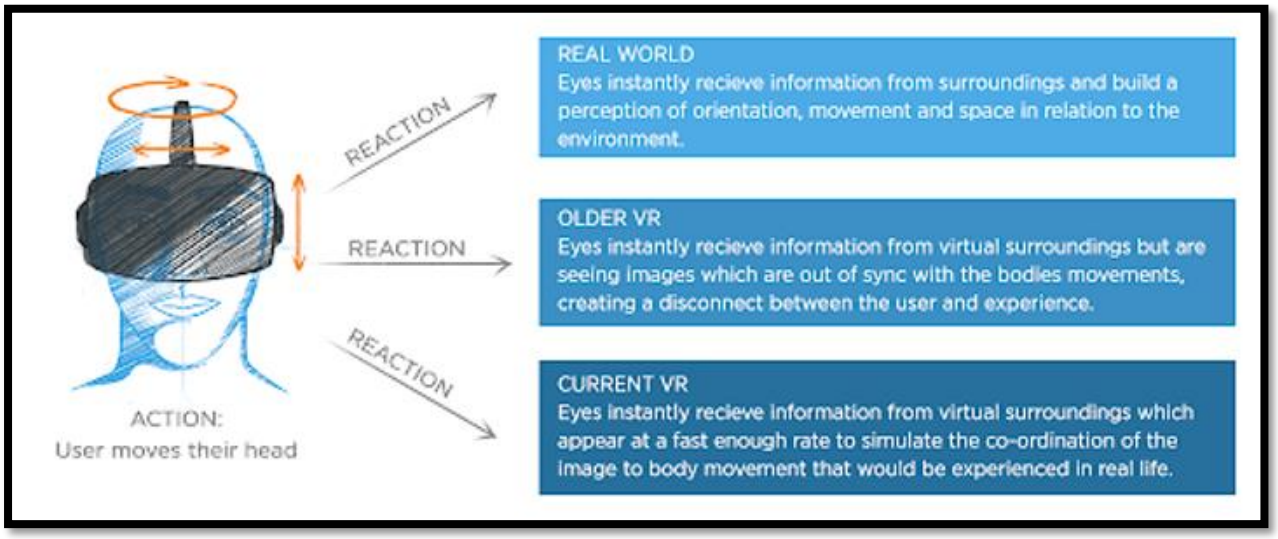
(i) Developing a Solution:

Awareness of context. knowing the user's physical surroundings. Two important aspects of the physical environment are depth and perspective. In order for designers to create experiences that keep users safe while they are in the virtual world, sensors in VR headsets will be able to map the environment around the user.

Create expressive faces that are realistic. We are aware that a sizable portion of interpersonal communication is nonverbal. Human emotion can be expressed through facial expressions. As you converse with other people, Avatar will be able to convey current human emotions.

Standardization of head, hand, and body movements for VR gestures. The use of conventional patterns will be made possible by standardization, making it much simpler for users to learn how to use products created for the metaverse.

Voice communications: Voice-based communication has the potential to play a crucial role in the virtual world. It's much more comfortable to interact with things using voice in a private setting.



(ii) Concept Development:

Rather than being a revolution, the metaverse is an evolution. It will be the next development based on a number of today's emerging technologies, including Web 3.0, Blockchain, and Mixed Reality technologies. Even though a fully developed Metaverse is years away, some ideas are already taking shape.

Businesses, for instance, use virtual reality for team building exercises, workshops, and client presentations. The immersive, persistent, and decentralized features of Metaverse offer a variety of business opportunities. Companies will be able to monetize these technologies as they develop by improving the customer experience, conducting virtual product marketing, and securely gathering consumer activity data.

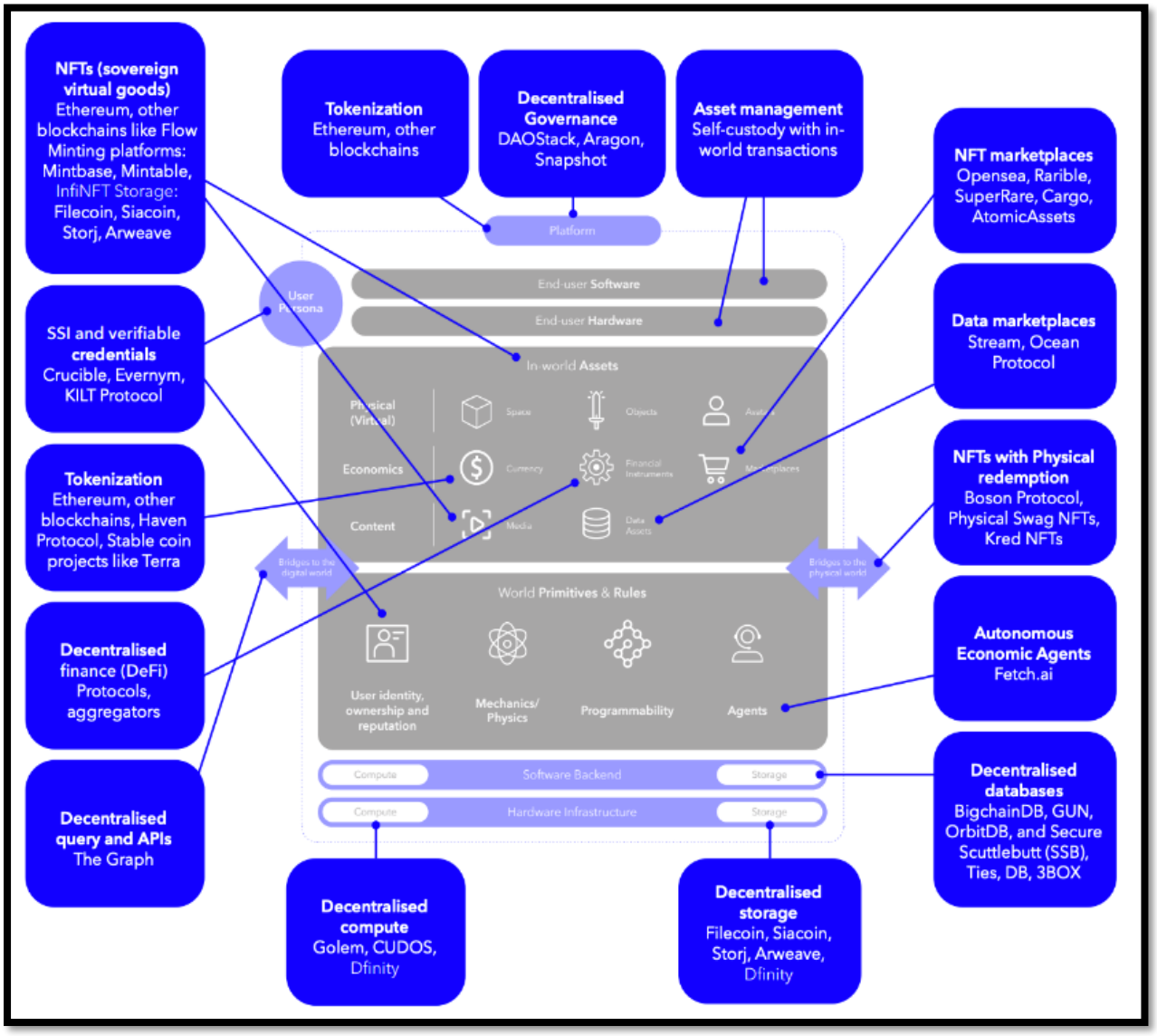
(iii) Check For IPR Status:

IP appears to have a promising future in the metaverse, which will usher in new types of nontraditional trademarks, new goods and services encompassing a range of trademark classifications, and new patentable VR- and AR-related technology. The shift to virtual reality may also create additional issues related to maintaining the confidentiality of trade secrets. As the establishment of appropriate measures to maintain secrecy is one of the fundamental legal requirements for protecting trade secrets, the virtual landscape will require new methods to maintain this secrecy beyond the orthodox methods of signing nondisclosure agreements or limiting access with biometric technology.

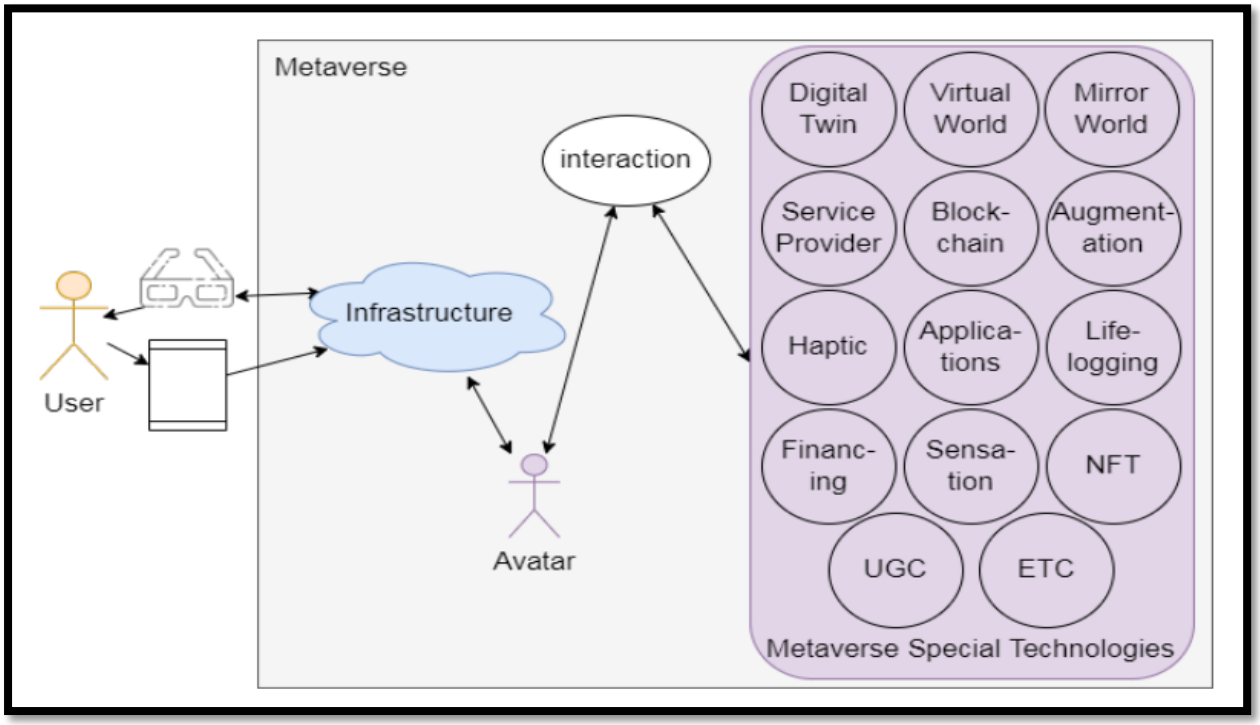
The metaverse will present challenges for IP law and IPR holders, but there will also be important opportunities for IP to evolve and become compatible with the metaverse ecosystem. Grasping these new opportunities to adapt to the metaverse will be both valuable and necessary to sustain the continued adaptation of IP law to novel technological advancements.

CHAPTER-4 PROTOTYPE

METAVERSE OPERATING SYSTEM



WORKING MODEL



FEATURES:

- The Metaverse is a collection of interconnected virtual worlds that enable users to carry out a number of tasks that are not feasible in the real world. Essentially, it is a parallel virtual reality. allows the user to engage in virtual activities within this environment to interact, carry out duties, play games, and study. User will have a programmable avatar or virtual identity when you are within the metaverse.
- High levels of decentralisation and transaction security have been prioritised in Web 3 technology development.
- The worlds of Web 3 and cryptocurrency are melding together with emerging spaces like gaming and virtual reality.
- The Metaverse (growing group of highly modular technologies) OS will be deployed in order to gradually open up additional sections of the Metaverse.
- The Metaverse requires its own economy and native currencies, where they may be acquired, used, lent, borrowed, or invested equally in a real-world or virtual setting, and, most crucially, without the requirement for a centralised authority.

PARTS OF PROTOTYPE

Animation

Animations will have the ability to go anywhere in the metaverse, but it is designed with constraint to make sure their energies look normal to the human sight.

Audio

The player's location inside the virtual space affects how the spatial audio responds. The audio loudness should increase as they go nearer an audible item.

For mood and ambience, ambient music is played throughout the session. Instead of detracting, it ought to improve.

Users may get more absorbed in the environment and guarantee that the metaverse sounds and feels like a genuine area by using audio feedback that is prompted by sound triggers.

Avatar

There is a lot of room for aesthetic innovation here, the prototype allows the user to create their own avatar based on their preferences.

Navigation

Allows the users to switch different perspectives [(i.e)First Person Perspective (FPP), Third Person Perspective (TPP)]. Camera and Controls plays an important role to improve the overall user experience.

BENEFITS OF METAVERSE PROTOTYPE

i) The Metaverse in the workplace

The metaverse offers tremendous prospects for workplaces. Users will be able to exchange ideas in virtual offices using VR technology. The metaverse may make it possible for users to generate real "in-person" experiences while working remotely in the present work environment. Overall helps in saving the expenses .

ii) The Metaverse in entertainment

Virtual reality experiences and games are not new. And the metaverse has the capacity to further enhance this type of entertainment. Provides immersive experience while watching movies, playing video games, and music performances.

iii) Metaverse practicality

There are countless useful applications for the metaverse. For instance, exposure treatment use VR platforms to help patients safely face their phobias. The metaverse can also be utilised to recreate situations and lower the risk of injury while training for combat and sports.

CHAPTER-5 TESTING PHASE

Performance Testing

Speed, responsiveness, and stability are essential components for any mobile application or website to provide a great user experience.

The same is true in the metaverse. Performance testing is essential to maximise quality since it can reveal problems or bottlenecks that could impair a platform's scalability, stability, speed, and responsiveness under both light and high user loads.

Performance testing is crucial for the metaverse due to the massive amounts of data and extremely fast networks needed to support AR and VR experiences. To maximise the quality of AR and VR experiences and enhance the overall user experience, latency problems must be identified and reduced.

Functional Testing

Functional testing is crucial for businesses to ensure a faultless user experience for any digital service, including the metaverse.

Functional testing, as its name suggests, is assessing functions to see if they perform as intended. As bugs are found, the development team may correct them, enhancing the platform's quality.

Usability Testing

Usability testing, in contrast to functional testing, evaluates the user experience on a larger scale. Usability testing is best carried out by actual users using real devices in a real-world setting. It looks for problems or defects that are not bugs or anomalies but yet contribute to a disappointing user experience.

Usability testing should be utilised with the metaverse to assess both the platform's general quality and the AR and VR experiences it provides. Usability testing, in particular, may assist organisations in improving their platform by revealing regions or components that can be improved, finding design defects that impede the user interface, and better understanding how users are engaging with the platform.

Compatibility Testing

It is crucial to evaluate the usability and functionality of the metaverse platform in addition to its interoperability with other devices that consumers will use to connect to and access the metaverse.

The AR and VR experiences in the metaverse will be dependent on and augmented by external devices, unlike our current typical internet experience. This covers wearable devices like VR headsets, AR glasses, AR sensors, and several more wearables. As a result, testing must be run to guarantee that these devices can connect to and work with the metaverse platform without issue.

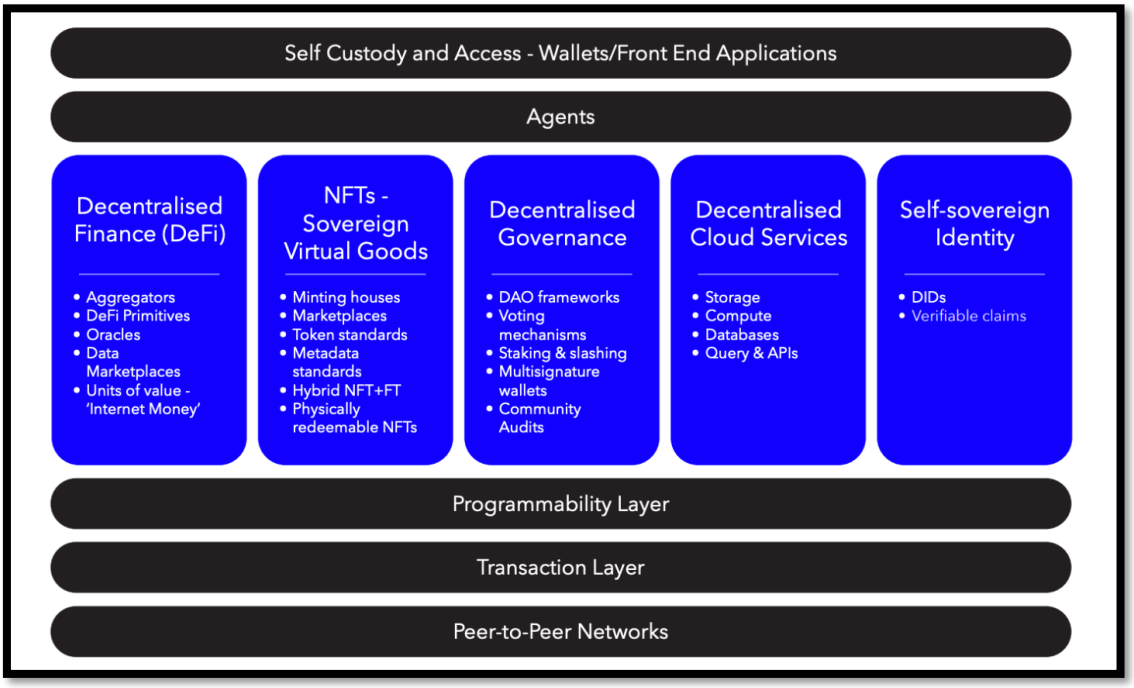
Accessibility Testing

To provide everyone with a top-notch user experience, metaverse must adopt accessibility standards as a digital service. Even though the metaverse and conventional applications and websites differ significantly, there is still plenty that can be done to build an inclusive and accessible metaverse.

CHAPTER-6 IMPLEMENTATION

Plan for mass metaverse implementation:

Metaverse is evolving and becoming more innovative by the day. Because metaverse is only possible through the combination of hardware and software, creating it necessitates the integration of numerous technologies and the implementation of numerous web3 tools.



We must contain the DeFi platform in order to safely handle money in the metaverse. Furthermore, NFTs decentralized features and cloud services integrate the entire world with an open OS platform. As a result of the addition of many features, ordinary users can interact with and customize the metaverse.

We address the question of why create or integrate a virtual world or good with Metaverse OS at all. With so many trade-offs and limitations to mass adoption, especially when compared to a more convenient closed and centralized approach?

We explain why we believe there is a general trend toward open standards in The Metaverse, even among what appear to be its closed participants, such as Open 3D object media standards and Metaverse Web Browsers.

Based on the concept of user centricity, we investigate the significance of principles of self-sovereignty, identity sovereignty, and associated digital wealth (including assets and, increasingly, data). Some may argue that the platform is the user in aggregate. In this context, we believe virtual worlds will serve as an interface for creating, trading, and experiencing virtual goods and services that are portable and not limited to a single platform.

And argue that this is a powerful economic driver as well as a fundamental paradigm shift away from the Closed Metaverse and its business models that currently dominate the Web. When creations, wealth, and assets can live 'off platform' and be freely exchanged and interchangeable with one another in open markets, they increase in liquidity and consequently value, simply because more value can be exchanged between itself without limitation. Something we suggest you consider as a type of 'value divided by two'

We propose that different virtual worlds, open or closed, can be viewed as slices of a larger whole. Where users can and will interact with and be a part of one or more of these worlds by design. And, while a single world may outgrow all others and become an important part of The Multiverse, it lacks the same defensible ‘moats' seen in Web 2 of locking users and their data into their platforms and holding them ransom.

As a result, we explain that virtual worlds in The Open Metaverse are increasingly interoperable and interconnected, to the point where it will be difficult to distinguish them as separate but rather different instances of a whole.

Business Model

The Metaverse will change the way people shop, play, get excited, and interact. As a result, companies' participation in this opportunity is critical for generating new business. They must understand consumer behaviour and needs and know how to approach them, resulting in a new immersive reality that combines physical and digital existence. The options are limitless. These are some of the industries that will generate new business opportunities.

Advertising and marketing

In the Metaverse, they have a bright future. The virtual world will spur the development of new formulas and mechanisms that will have an unprecedented impact on users. Specializing in marketing strategies for the Metaverse is a thriving field where businesses can experience the vast array of possibilities offered by this virtual reality. Connecting with Generation Z and establishing visibility as a reference company in future marketing will enable the development of new products and services.

Virtual goods

Almost everything marketed in the real world can be sold in the Metaverse (clothing, houses, travel, cars)—visiting physical stores to try products or assess their quality will be obsolete. Virtual and augmented reality will enable people to buy products from the comfort of their own homes and have them delivered at the touch of a button. Another opportunity will be the personalization of digital avatars, which will enable the development of a plethora of customized products.

Work from home

Work will increasingly be conducted in the Metaverse via online meetings and training. Businesses that offer to foster a hybrid company culture, which can connect people working remotely with virtual reality spaces, will see an increase in demand. Similarly, projects allow people to learn through educational platforms.

Extensive training experience

Among the many possibilities provided by the Metaverse is professional training via virtual reality glasses. Immerse yourself in virtual spaces where the team is integrated, confronted with realistic situations in which decisions have consequences. Professionals can be trained and gain experience for the position in this manner.

Business virtual spaces

Attending conferences, viewing virtual exhibitions, and travelling around the world will be critical in creating a world that is one step beyond reality. Mymetaverse currently specializes in creating virtual spaces for businesses. Microsoft Mesh will also be available for Microsoft Teams, allowing people to collaborate from anywhere and be productive in a shared 3D space.

Entertainment

The ability to join a background in person or virtually will open up many possibilities for recreation in the Metaverse, online events, and mixed reality experiences. The movement of luxury brands in the Metaverse has piqued everyone's interest. These companies have structured customer relationships, as evidenced by the presence of two annual collections and flagship stores on city main streets. This industry views entertainment as a transversal axis through which it can communicate and interact with its potential customers on a continuous basis, bringing this world closer to a younger target that might not be a target for them due to their purchasing power.

Gaming

It is one of the most advanced sectors and has long been central to the Metaverse's plans. The play-to-earn model introduces the concept of a monetary reward for each user who adds value to the game by playing and spending time in it. Users in the Ethereum-based video game The Sandbox can purchase virtual land on which to develop their personalized game proposals. It has over 176 thousand lands belonging to 20 thousand users in a virtual world with over 2 million registered users. Sandbox has piqued the interest of brands such as Adidas, Warner Music, and Carrefour, as well as artists such as Snoop Dogg.

Production procedures

Metaverse applications will enable manufacturing process adjustments, quality control, and a variety of other actions. Companies will be able to improve their operations and delivery times as a result.

Data safety

In the Metaverse, data is important. Because all platforms want data from users, data management with professional providers is critical. Data security may be a high-demand business model in the coming years, so it is critical to ensure ethical, transparent, and responsible use. Businesses devoted to cybersecurity will also have a place to control threats and safeguard private data.

Cryptocurrencies

The Metaverse has its own economy. Cryptocurrencies and digital currency will most likely become the primary means of transaction between the real and virtual worlds.

Financial planning: The finance and monetisation required for the creation of the open metaverse platform and OS is determined by the number of tools and different softwares we will handle because there is a high demand for web3 developers at this stage of development. Hiring developers is the primary goal of our development.

Then, handling social media and marketing for our Metaverse OS, as well as collaborating with NFT managers who can assist us in reaching out to people and increasing traffic in our metaverse.

Maintaining bug-free metaverses is a critical task for our project, because providing a lag-free and glitch-free experience in our metaverse will increase traffic and attract a large number of gamers and users interested in using metaverse.

A significant amount of money should be invested in promoting our project through advertisements and celebrities with low polling fees.

As a result, our finances may change as a result of the tools we use, and various types of development processes for our metaverse project take place.

Marketing and sales:

The practise of promoting and selling a company's products or services is known as marketing. It includes the four P's of marketing: price, product, promotion, and location. Marketing and advertising in the metaverse can provide new places to shop and new avenues for promotion.

The metaverse is all about giving customers a memorable experience. Marketers can embrace a future in the metaverse whether they are selling products or services.

Before entering the metaverse, organizations should set goals and experiment because platforms are constantly evolving. Businesses should begin small in order to test reactions and make necessary adjustments.

Businesses should think about how they can use the metaverse to reach their target audience. If the primary goal is to increase sales, offer virtual items similar to those found in physical stores. Find a way to connect the two so that people can have both virtual and physical access to them. However, before entering a metaverse platform, make sure you know who you're talking to. Roblox, for example, is typically aimed at a younger demographic.

- Here are some examples of how marketers can use the metaverse to reach their target audience:
- Make collectibles accessible. People enjoy collecting items, and the metaverse now offers a new opportunity to start a new collection. Users can also trade digital collectibles with one another. Nike, for example, is developing unique NFTs for digital products that are secured with blockchain technology to prove ownership.
- Participate in existing communities. Businesses should not show up in an existing community and try to sell to its members. Consider the current platform's design instead. Interact with current members to generate user-generated content, such as videos, text, images, and audio, and they will naturally assist in the execution of a business's campaign.
- Employ native advertising. As people explore the metaverse, opportunities for native advertising such as billboards on virtual streets or product placement will emerge. There are also sponsorship opportunities for metaverse events. Virtual billboards for Coca-Cola and Samsung can be found in video games such as Football Manager. Furthermore, rapper and recording artist Nas promoted his new album through in-game audio advertisements in racing games and Fortnite.
    - Create a unique metaverse platform. This is the most costly and significant way to invest in the metaverse. Businesses can create a game or a world that is specific to their product or service; however, this complete experience may require time, research, and a significant investment to find the best fit with the target audience.
    - For example, Shopify recently launched a new AR/3D shopping experience that allows businesses to create virtual versions of their products, and it is also developing its own NFT marketplace.

- Allow customers to try out your products. Companies can view a 3D version of a product before purchasing it using virtual and augmented reality. Car manufacturers, such as Porsche and Hyundai, have created virtual viewing rooms and events to give customers a virtual tour of their vehicles. Companies can do the same with a variety of items, such as using augmented reality to see furniture in their home or trying on clothing, so customers do not have to leave their homes to try a new product.

- Create interactive live events. When the pandemic struck, many events became virtual, but the metaverse can take them to a whole new level. These events are interactive and have 3D options. To feel less alienated, remote employees will also be physically present in the metaverse with others. The metaverse can be more cost effective and flexible, allowing for collaboration and interaction. This is accomplished by visualising and solving problems in 3D rather than the current 2D limitations of virtual meetings.

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