

Metaverse, NFTs in Metaverse and DeSoc: Business Applications and Beyond

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Introduction

The concept of the metaverse, a virtual shared space that is created by the convergence of virtually enhanced physical reality and physically persistent virtual space, has been around for decades. However, it was popularized in the late 20th and early 21st centuries through science fiction literature and media, and more recently, through the development of virtual and augmented reality technologies.

- According to recent reports from the World Economic Forum, Metaverse business is expected to be worth over \$100 billion by 2025, with a projected annual growth rate of 20%.
- Metaverse business has the potential to create massive economic opportunities, including over 80 million jobs worldwide by 2027.
- According to a recent survey, 92% of businesses adopting Metaverse business solutions are seeing increased revenue and improved customer satisfaction ratings.

Businesses worldwide are using the metaverse to create unique, immersive experiences for example Honda, Walmart, and Audi use the metaverse for virtual events or product launches. Walgreens is using it for virtual doctor visits – customers can have a real-time video consultation with one of their doctors from wherever they are.

What Is the Metaverse?

Metaverse is a spatial computing platform that provides digital experiences as an alternative to or a replica of the real world, along with its key civilizational aspects like social interactions, currency, trade, economy, and property ownership – founded on a bedrock of blockchain technology.

To be simpler, metaverse is a shared, online 3D space where users can interact with each other and with computer-generated objects and avatars. Metaverse is at the cutting edge of technological and digital discoveries. It is a universe of limitless, interconnected virtual communities where people can socialize, collaborate, and have fun using virtual reality headsets, augmented reality glasses, smartphone apps, and other technologies. It would allow people to have real-time interactions and experiences across large distances. It is an environment where the physical and digital worlds can coexist and significantly impact fundamental areas of daily life such as social media and shopping.

There are many metaverses existing today. Most of them were created by individual companies and serve a particular purpose. There is little to no interoperability among metaverses, as the standards of sharing user identities and data across different metaverse spaces have not been developed yet.

As application scenarios mature, the Metaverse will develop into an exceptionally large-scale, extremely open, and dynamically optimized system. To create a system that can support various virtual reality application scenarios, creators from different fields will have to work together.

The History and Evolution of the Metaverse

- **The Origins of the Metaverse**

The term “metaverse” was coined by science fiction author Neal Stephenson in his 1992 novel *Snow Crash*. In the novel, the metaverse is a virtual world where users can interact with each other and with virtual objects in real time. This concept was influential in shaping the modern understanding of the metaverse, and it inspired many other works of science fiction that explored similar themes.

- **The Early Development of Virtual Reality**

While the concept of the metaverse was first introduced in the literature, the development of virtual reality technologies in the late 20th century laid the foundation for its eventual realization. In the 1980s and 1990s, researchers and companies began to develop virtual reality systems that used headsets and gloves to immerse users in a computer-generated environment. These early virtual reality systems were primarily used for military training and simulations, but they also sparked the imagination of the public and laid the groundwork for the development of more advanced virtual and augmented reality technologies.

The roots of the metaverse concept can be traced back to the early days of virtual reality (VR). The 1960s witnessed the birth of the first VR systems, though they were far from the consumer-friendly devices we know today. In 1962, Morton Heilig patented the Sensorama, a machine he described as the “Cinema of the Future.” It was designed to stimulate all five senses, attempting to fully immerse the user in a virtual world.

The term ‘virtual reality’ itself was popularized in the 1980s by Jaron Lanier, the founder of the visual programming lab (VPL). VPL Research developed several pioneering VR devices, including the Dataglove and the EyePhone Head-Mounted Display. Although these early systems were primitive and unwieldy by today’s standards, they laid the essential groundwork for the immersive virtual worlds that would become a core part of the metaverse.

- **The Rise of Massively Multiplayer Online Games**

In the late 1990s and early 2000s, the rise of massively multiplayer online games (MMOs) marked an important step in the evolution of the metaverse. MMOs are virtual worlds that allow large numbers of players to interact with each other and with the game environment in real time. These games, such as *World of Warcraft* and *Second Life*, provided users with the ability to create and customize their avatars, explore virtual worlds, and interact with other players in a persistent online environment.

- **The Internet: The Metaverse’s Essential Foundation**

The internet has been pivotal in shaping the metaverse concept. As a globally interconnected network, the internet enabled people from all over the world to connect, share information, and collaborate in unprecedented ways. The internet’s framework provided the backbone for developing shared, virtual spaces, laying the groundwork for the concept of the metaverse.

Furthermore, the internet’s evolution played a crucial role in moulding the metaverse. In its early years, the internet was largely a static medium – a vast repository of linked documents

where interactivity was limited. As technology evolved, so did the internet, morphing into a platform where users could interact not only with the content but with each other, creating a more dynamic and social experience. This social, interactive layer of the internet set the stage for the development of the metaverse's shared, interactive virtual spaces.

The advent of Web 2.0 marked a significant shift in how users interacted with the internet. No longer just consumers of information, users became creators. Blogs, wikis, video sharing platforms, and social media networks empowered users to generate their own content and share it with the world. This user-generated content brought a level of dynamism and personalization to the internet, traits essential for the metaverse. Moreover, the rise of social networking platforms such as Facebook, Twitter, and Instagram signalled the growing importance of social interactions in the digital world, a core aspect of the metaverse. Web 2.0 also introduced new levels of interactivity to the internet. Users could comment, like, share, and directly participate in the digital experience. This interactive nature is at the heart of the metaverse, where user interactions define the environment and contribute to its continual evolution.

- **The Development of Virtual and Augmented Reality Technologies**

In the 2010s, the development of virtual and augmented reality technologies allowed for the creation of more immersive and interactive virtual experiences. Virtual reality systems, such as the Oculus Rift and the HTC Vive, use headsets and motion controllers to allow users to fully immerse themselves in a virtual environment. Augmented reality technologies, such as the HoloLens and Pokemon Go, overlay digital information and graphics onto the physical world, allowing users to interact with virtual objects in the real world. These technologies have opened up new possibilities for the metaverse, allowing users to interact with virtual objects and environments more seamlessly and realistically.

- **The Current State of the Metaverse**

Today, the metaverse is a rapidly growing and evolving platform for communication, entertainment, and commerce. Virtual reality and augmented reality technologies are being used for a wide range of applications, including gaming, education, training, and social interaction. In addition, the development of blockchain technologies has enabled the creation of virtual economies within the metaverse, allowing users to buy, sell, and trade virtual goods and services.

- **The Future of the Metaverse**

As virtual and augmented reality technologies continue to advance and become more widely adopted, the metaverse will likely become an increasingly important platform for communication, entertainment, and commerce. The development of new technologies, such as 5G networks and edge computing, will allow for even more immersive and interactive virtual experiences, and the integration of the metaverse with the physical world will blur the lines between the virtual and the real.

How Does the Metaverse Work?

The Metaverse is a complex and evolving concept, and the specific workings can vary depending on the platform or virtual world involved. However, there are a few common principles and technologies that underpin the functioning of the Metaverse. Here's a general overview of how the Metaverse works:

Virtual Environments: The Metaverse consists of interconnected virtual environments or worlds. These environments can be created by individuals, organisations, or developers and are often designed to simulate various aspects of the real world or offer unique fictional experiences.

User Avatars: Within the Metaverse, users typically create and control digital representations of themselves called avatars. Avatars serve as the users' virtual personas, enabling them to navigate and interact with the virtual environments and other users.

Interactivity: The Metaverse enables real-time interaction and communication between users. Users can engage in activities such as socialising, exploring virtual spaces, attending virtual events, participating in games, and collaborating on projects. This interaction can occur through voice and text chat, gestures, or other forms of communication depending on the platform.

Virtual Assets and Economies: The Metaverse often involves the existence of virtual assets, such as digital currencies, virtual goods, or NFTs. These assets can be bought, sold, and traded within the Metaverse, allowing for virtual economies and commerce. Blockchain technology is often utilised to ensure the security, provenance, and ownership of these virtual assets.

Platform and Technology Integration: The Metaverse relies on various technologies and platforms for its functioning. This can include virtual reality (VR) and augmented reality (AR) devices, gaming consoles, internet browsers, and specific software applications. These technologies provide the means for users to access and experience the virtual environments of the Metaverse.

Standards and Interoperability: As the Metaverse continues to develop, efforts are being made to establish standards and protocols that enable interoperability between different virtual worlds and platforms. This allows users to carry their digital assets, identities, and experiences seamlessly across different parts of the Metaverse.

User-Generated Content: A key aspect of the Metaverse is the ability for users to create and contribute their own content. Users can design and build virtual spaces, create artwork, develop games, and contribute to the overall richness and diversity of the Metaverse. This user-generated content plays a crucial role in shaping the virtual worlds and driving engagement within the Metaverse.

It is important to note that the Metaverse is still a developing concept, and its workings are subject to ongoing innovation and exploration. Different platforms and virtual worlds may have their own unique features and mechanics, but the overarching goal is to create an immersive and interconnected digital space where users can interact, create, and explore.

Metaverse Technologies

The **development of the Metaverse relies on various technologies** that enable the creation and functioning of immersive virtual environments. Here are some key technologies involved in building the Metaverse:

Virtual Reality (VR): VR technologies create immersive and interactive virtual experiences. VR headsets, such as the Oculus Rift, HTC Vive, or PlayStation VR, provide users with a sense of presence in virtual worlds by blocking out the physical environment and replacing it with a simulated digital reality.

Augmented Reality (AR): AR technologies overlay virtual content onto the real world, allowing users to interact with virtual objects and information in their physical surroundings. AR devices like Microsoft HoloLens, Google Glass, or AR-enabled smartphones and tablets enhance the perception of reality by blending digital elements with the real environment.

3D Graphics and Rendering: Realistic and immersive virtual environments in the Metaverse require advanced 3D graphics and rendering techniques. These technologies generate and display high-quality visuals, including detailed 3D models, textures, lighting, and effects that contribute to the realism and immersion of virtual worlds.

Spatial Mapping and Tracking: Technologies like depth sensors, cameras, and laser scanners enable spatial mapping and tracking, allowing virtual worlds to align with real-world physical space. This enables users to move around and interact with virtual objects in a more natural and intuitive manner.

Artificial Intelligence (AI): AI technologies play a role in the Metaverse by providing intelligent behaviours and interactions within virtual environments. AI-powered characters and entities can exhibit realistic and autonomous behaviours, respond to user actions, and create dynamic and engaging experiences.

Blockchain and Cryptocurrency: Blockchain technology enables secure and transparent transactions, digital ownership, and decentralised economies within the Metaverse. Blockchain-based systems can be used to verify ownership of virtual assets, create and trade non-fungible tokens (NFTs), and establish virtual currencies for in-world transactions.

Networking and Interoperability: The Metaverse requires robust networking infrastructure to enable real-time communication and interactions between users across different virtual worlds and platforms. Interoperability protocols and standards ensure seamless connectivity, allowing users to carry their digital identities and assets between various Metaverse experiences.

User-Generated Content Tools: Metaverse technologies often include user-friendly tools for creating and contributing content. These tools empower users to build virtual environments, design avatars, create objects, and develop interactive experiences, fostering a collaborative and creative ecosystem within the Metaverse.

Social and Communication Platforms: Metaverse technologies include social and communication features to facilitate interactions and collaboration among users. These

platforms enable voice and text chat, social networking, event hosting, and other community-building activities within the virtual environment.

Understanding the seven layers of the Metaverse

Entrepreneur and author, Jon Radoff, has suggested that the Metaverse comprises seven distinct layers, with each layer influencing one aspect of the user experience:

Experience: Physicality's limitations will be removed as physical space is dematerialized in the digital world. The Metaverse will provide people with a wide range of experiences we cannot currently enjoy.

Discovery: Through app shops, search engines, and rating websites, customers can learn about new platforms thanks to this layer. Finding new technology and communities requires this crucial step.

Creator Economy: To produce digital assets or experiences, developers use various design tools and apps. Numerous platforms are developing more straightforward creative methods over time, for example, drag-and-drop tools.

Spatial Computing: It blends mixed reality (MR), virtual reality (VR), and augmented reality (AR). Over time, it has developed into a significant technology category that enables users to interact with 3D environments for enhanced experiences.

Decentralization: There will not be a single authority that rules the Metaverse. Scalable ecosystems will support business owners in providing a more comprehensive range of specialized digital items as the Metaverse expands, enabled by blockchain technology.

Human Interfacing: The hardware layer of the Metaverse must include human interfacing. Any virtual world can accept a person's body as a 3D, realistic avatar.

Infrastructure: The technology that powers people's gadgets, connects them to the network, and distributes content is part of the infrastructure layer. Over time, 5G networks will dramatically enhance the capacity of the Metaverse.

How Is the Metaverse Accessed?

Accessing the Metaverse can involve various methods and devices, depending on the platform and virtual world you want to enter. Here are some common ways to access the Metaverse:

Virtual Reality (VR) Headsets: VR headsets provide an immersive experience by blocking out the physical world and replacing it with a virtual environment. Examples of VR headsets include the Oculus Rift, HTC Vive, and PlayStation VR. Users wear these headsets to enter and interact with virtual worlds, using hand controllers or other input devices to navigate and engage with the environment.

Augmented Reality (AR) Devices: AR devices overlay digital content onto the real world, allowing users to interact with virtual elements while still being aware of their physical

surroundings. AR glasses like Microsoft HoloLens or mobile devices with AR capabilities, such as smartphones and tablets, can provide access to AR-based Metaverse experiences.

Computers and Mobile Devices: Many Metaverse platforms can be accessed through standard computers or mobile devices. These platforms typically offer web or application-based interfaces that allow users to access virtual worlds, engage with other users, and participate in activities without the need for specialised VR or AR equipment.

Gaming Consoles: Some gaming consoles, like PlayStation, Xbox, or Nintendo Switch, offer access to certain Metaverse experiences through specific games or applications. These consoles may support VR headsets or provide their own virtual environments where users can socialise and engage with others.

Internet Browsers: Certain Metaverse platforms can be accessed directly through internet browsers, similar to visiting a website. These platforms provide web-based interfaces that allow users to explore virtual worlds, interact with other users, and participate in various activities directly through the browser.

Dedicated Metaverse Applications: Some Metaverse platforms may require users to download and install dedicated applications to access their virtual worlds. These applications can provide enhanced features and functionalities specific to the respective Metaverse platform.

Industrial Metaverse: How it is transforming the working of manufacturing & industrial businesses

In the industrial metaverse, engineers, product designers and technicians harness the power of collaborative virtual and digital environments to streamline the manufacturing process. A key concept is the digital twin – a digital simulation of a real-world product, structure, process or system that draws on data from its “real” twin to create a computer model that can be manipulated and experimented with in the safety of a virtual environment. Of course, the concept of digital simulation has existed in industry for decades. Adapting it to the metaverse paradigm, however, creates new possibilities due to the collaborative nature of the metaverse environment.

Augmented reality (AR) technology means it is possible to bring these digital twin models into a real-world environment. For example, builders can stand on a plot of land and see the building they intend to create visually around them. Using headsets, an entire team of architects, structural engineers and site managers can see the building around them and even “edit” it in real-time, adding or removing elements to see how it affects the structure as well as the landscape around it. Information about the cost of the development, as well as the manpower requirements, can be overlayed on the visualizations in real-time. This may sound futuristic and far-fetched, but similar processes are already being used by BMW to accelerate the design and prototyping of new vehicles.

The industrial metaverse consists of the intersection of many cutting-edge tech trends, including 5G networking, cloud and edge computing, and machine learning-driven technologies like computer vision and the Internet of Things (IoT). Industries that are able to pull these together to create the immersive, persistent digital environments that enable industrial collaboration at scale are likely to emerge as leaders in this field.

Enterprise Metaverse: How it is transforming the working of Companies

It is not just manufacturing and industrial businesses that are making use of metaverse technology. In today's post-pandemic world, and as companies and employees explore ways to offer more flexible working arrangements to fit in with changing lifestyles, immersive, collaborative digital tools enable any company to experiment with new and more productive working processes.

The virtual reality workplace is one of the cornerstones of Meta's Horizon vision, offering collaborative environments where teams can gather. Other tools that are already familiar to millions of enterprise workers around the world – such as Microsoft Teams and Zoom – have built metaverse functionality into their platforms over the past year. Mesh for teams adds avatars to Microsoft's familiar collaborative working environment, and Zoom has added a feature called Welo, which lets companies create persistent digital environments in which to hold meetings.

Another use case that is quickly gaining traction is team building, onboarding and training. Accenture has developed a metaverse environment called the Nth Floor, designed to allow its tea members to “meet, learn and collaborate in new ways.” All new employees are expected to visit in order to be briefed on specifics they need to know when joining the company. And at Nokia, one team has implemented a weekly 30-minute “lunch and learn” VR learning session.

What are the business opportunities of a Metaverse?

The business opportunities of a metaverse are vast. Companies can use the technology to host virtual events, launch new products, create virtual stores, provide virtual tours of their product or services, and much more. Additionally, businesses can leverage the metaverse to improve customer relationship management by personalizing their experiences and providing helpful insights into their preferences.

With the help of the metaverse, businesses can also make more informed decisions by collecting and analysing customer data. This data can be used to understand better customer behaviour and preferences, which can help companies make strategic decisions that will result in increased profits.

Finally, businesses are seeing success in using the metaverse to market their products or services to potential customers. Companies are leveraging technology to create engaging, interactive campaigns that can be shared across multiple platforms, driving more traffic and increasing sales.

Why is the Metaverse important for business?

The metaverse offers unprecedented opportunities for businesses to reach new markets, engage with customers personally, and create unique products or services that cannot be found anywhere else. It also provides a platform to showcase the brand and increase customer loyalty.

Ultimately, the metaverse is helping businesses become more efficient, improve communication between departments, and increase customer satisfaction. It also saves companies money by cutting out the need for physical stores or offices.

Here are a few reasons why it is essential for any business:

- Reach new markets
- Engage with customers on a personal level
- Create unique products and services
- Showcase brand identity
- Increase customer loyalty
- Become more efficient
- Improve communication between departments
- Increase customer satisfaction
- Save money by eliminating physical stores or offices
- New opportunities for marketing strategies

Sectors getting benefited from Metaverse

The Metaverse has the potential to revolutionise numerous industries by leveraging immersive technologies and virtual experiences. Here are some examples of how Metaverse technology can benefit different sectors:

Gaming and Entertainment: The gaming industry is a natural fit for the Metaverse, with virtual worlds, virtual reality (VR), and augmented reality (AR) offering immersive gaming experiences. The Metaverse can provide multiplayer environments, virtual events, in-game economies, and opportunities for user-generated content, creating new avenues for engagement and monetization.

Retail and E-commerce: The Metaverse can transform the retail industry by enabling virtual shopping experiences. Users can explore virtual stores, interact with products, try virtual try-ons, and make purchases within the virtual environment. Brands can leverage NFTs for limited-edition digital items or virtual collectibles, creating unique offerings for customers.

Real Estate and Architecture: The Metaverse can revolutionise the real estate industry by offering virtual property tours, architectural visualisations, and virtual staging. Clients can explore properties remotely, visualise designs in 3D, and even interact with virtual home furnishings. Blockchain technology can ensure secure property transactions and establish verifiable ownership.

Education and Training: The Metaverse has the potential to enhance education and training by providing immersive and interactive learning environments. Students can engage in virtual classrooms, participate in simulations, and collaborate with peers in a virtual setting. Training

programs can offer realistic simulations for various industries, improving skill development and hands-on learning.

Healthcare and Telemedicine: Metaverse technology can transform healthcare by enabling telemedicine consultations, remote patient monitoring, and virtual healthcare simulations. Patients can receive care from anywhere, and healthcare professionals can collaborate and train in virtual environments. VR technology can aid in pain management, therapy, and rehabilitation.

Marketing and Advertising: The Metaverse can offer innovative marketing and advertising opportunities. Brands can create virtual experiences, interactive ads, and sponsored virtual events to engage with consumers. Virtual product placements, branded virtual spaces, and collaborations with virtual influencers can provide unique ways to reach and connect with audiences.

Social Networking and Communication: The Metaverse can reshape social networking and communication by offering immersive and interactive platforms for social interaction. Users can socialise with friends, attend virtual gatherings, and explore virtual communities. Avatars and virtual environments enable self-expression and creative interactions.

Travel and Tourism: The Metaverse can provide virtual tourism experiences, allowing users to explore destinations virtually, visit landmarks, and engage in cultural experiences. Travel agencies can offer virtual travel planning, virtual tours, and virtual reality experiences that showcase destinations, attracting potential visitors.

What Are the Benefits of the Metaverse?

The Metaverse offers several potential benefits across various aspects of our lives. Here are some key benefits associated with the Metaverse:

Immersive Experiences: The Metaverse provides immersive and interactive experiences that go beyond traditional online interactions. Users can explore virtual worlds, engage in realistic simulations, and participate in virtual events, offering a heightened sense of presence and engagement.

Social Interaction and Connectivity: The Metaverse enables social interactions on a global scale. Users can connect with others, socialise, collaborate, and build communities within virtual environments. It bridges geographical barriers, fosters cross-cultural understanding, and provides opportunities for networking and collaboration.

Digital Commerce and Economy: The Metaverse creates new opportunities for virtual commerce and economic activities. Users can buy, sell, and trade virtual goods, digital assets, and services within the virtual economy. It opens up avenues for entrepreneurship, virtual businesses, and innovative revenue models.

Education and Learning: The Metaverse has the potential to revolutionise education and learning experiences. It offers immersive and interactive virtual classrooms, simulations, and training environments. Students can engage in experiential learning, explore virtual historical sites, and gain practical skills in a dynamic and engaging manner.

Entertainment and Media: The Metaverse expands possibilities for entertainment and media consumption. Virtual concerts, live events, and immersive storytelling experiences provide new avenues for artists, performers, and content creators to engage with audiences globally. It offers personalised and interactive entertainment experiences.

Collaboration and Innovation: The Metaverse facilitates collaboration and innovation by providing a shared virtual space. Users can collaborate on projects, co-create content, and exchange ideas in real-time, regardless of their physical location. This fosters cross-disciplinary collaboration, knowledge sharing, and rapid innovation.

Access and Inclusion: The Metaverse has the potential to provide equal access and inclusion. It offers accessible experiences for individuals with physical disabilities or limited mobility, ensuring that digital spaces are inclusive and accommodating. It can also amplify the voices and representation of marginalised communities.

Environmental Impact: The Metaverse has the potential to reduce the carbon footprint associated with physical travel and infrastructure. By enabling virtual meetings, events, and activities, it can contribute to reducing greenhouse gas emissions and promoting sustainable practices.

Disadvantages / Challenges of Metaverse

Let us discuss some of the disadvantages of Metaverse:

1. Inaccessibility

The Metaverse sounds super fun. But it brings many new and advanced technologies such as VR headsets, haptics, and blockchain, among other requirements. The problem is that we cannot all have access to these advanced (and pricey) digital tools. What is more, fast and reliable internet connectivity will be a mandatory requirement to make shared virtual environments seamless. Yet people will not all be able to access speedy, next-generation broadband and thus capitalize on the full potential of Web 3. For the decentralized Metaverse to thrive and remain inclusive to all, we must develop plans to increase accessibility. Companies will have to invest in these areas to ensure that their customers can enjoy the space.

2. Negative impact on society and culture

As the metaverse becomes more integrated into our daily lives, it is important to consider the social and cultural implications of this technology. Bringing people together is positive. But fusing the world's different cultures might risk losing its beautiful diversity. Is this new way of life worth the risk of sacrificing our connections to our small, immediate societies? Our regional traditions? Our uniqueness?

3. Losing connection with the physical world

We interact differently as avatars in the virtual world than we do as people in the real world. But while trying unexplored and out-of-this-world activities is fun, establishing new virtual behaviour patterns could discredit real - world human behaviours. Worse, this could have a knock-on effect on our human relationships.

The Metaverse may blur the gap between the virtual and the real. It could desensitize us to our physical surroundings. How we are feeling. How we interact with others. So, there are concerns about the impact of the metaverse on our social interactions and relationships.

4. And then there is the scare of addiction

Too much time in virtual worlds could lead to user withdrawal from real-world action. We mean. Those all-too-familiar TikTok rabbit holes are bad enough. "just 5 more minutes" turns into 2 hours of endless scrolling. Come on, we've all panicked at that screen time notification at the end of the day.

Likewise, we could lose track of time within the virtual space. And due to the immersive aspect, it'll be much easier to find ourselves spending more time in the Metaverse than we could ever spend scrolling on our phones. There's a scary potential for us to be burdened by virtual blinders and become so focused on the virtual experiences that we fail to see what is happening in the real world around us.

VR "hangovers" are a known phenomenon, and people can experience post-VR sadness. This is because we can have so much fun in the immensity of the Metaverse that we feel a huge anti-climax upon returning to reality.

Despite intimate exposure to the Metaverse, we have to be responsible for maintaining our attachment to reality. We have to remember that our real world also exists outside of the virtual one. We have to find the balance between experience and life.

5. Cybercrime

Cybercrime is a serious problem that has plagued us as long as it has existed. And with a worry that the Metaverse will lessen the difference between what we perceive as the virtual and the real, how can we regulate it? For example, how do we police someone robbing a virtual supermarket? Or going on a purge? Is a virtual crime punishable the same way a real one is? Grey areas are never a good thing.

Can we guarantee that rules of law will be developed as quickly as a growing threat of potential crimes develops? The more advanced the AR and VR, the more crimes will emerge. Data theft, assault, money laundering, cyber-bullying, the spread of false information, identity hijacking. As a decentralized space, how on earth can we govern this new world? Perhaps this whole Metaverse setup is a double-edged sword...

6. Privacy and Security Issues

Many Web 2 digital solutions today have been associated with concerns regarding privacy and security. And we have to be honest; existing issues still need to be resolved. So as an online-enabled space - the next generation of the internet - the Metaverse can lead to new problems in security and privacy for users. Issues that people worry about maybe even more invasive and intense.

But DAOs are here to save the day. As digital systems that run on the blockchain through smart contracts, they will help us become owners of our data and assets. These contracts dictate the rules of the Metaverse, the decision-making, and how governance unfolds. As a virtual space that allows governance to the people that populate them, DAOs will increase trust in users and gives a sense of financial and psychological ownership over online activity. In a decentralized Web3, we all will be sovereign over our identity, assets, and data.

The Metaverse is still in its early stages, and we have a lot to learn. But once we tighten the safety and security aspects, the opportunities for individuals, groups, businesses (and whoever else wants a big slice of the Web3 cake) will be boundless.

7. Virtual Harassment

Hateful behaviours towards others can be found in all parts of the internet in its current form. And unfortunately, it is not an overnight job to eradicate these issues as we enter the web's latest phase. Social media has meant that school bullying has become more of a problem than ever before. And understandably, people have concerns that this epidemic will only worsen as we develop and enter the virtual world. Adjusting from Web2 to the 3D settings of Web3 - letting users feel fully immersed in the Metaverse - could give harassers more power to have a far more intrusive impact.

Regulation of the Metaverse

Regulating the Metaverse presents a complex challenge due to its decentralised and immersive nature. While there is no established regulatory framework specifically tailored to the Metaverse, discussions and considerations regarding its regulation have begun. Here are some aspects to consider when discussing the regulation of the Metaverse:

Data Privacy and Security: Regulation should address data privacy concerns within the Metaverse. It should ensure that user data is protected, consent is obtained for data collection and usage, and appropriate security measures are in place to safeguard personal information.

Content Moderation: As the Metaverse allows user-generated content, regulation should address issues of moderation, including guidelines for addressing harmful or illegal content, ensuring the safety of users, and protecting against misinformation, hate speech, or intellectual property infringement.

Virtual Assets and Digital Ownership: The regulation should address the ownership, transferability, and protection of virtual assets, such as non-fungible tokens (NFTs). It should establish frameworks for authenticating ownership, resolving disputes, and ensuring fair trading practices

Consumer Protection: Regulations should protect consumers within the Metaverse context, addressing issues such as fair pricing, transparent transactions, and proper disclosure of virtual goods or services. It should also ensure that users are not subject to fraudulent or deceptive practices.

Intellectual Property Rights: Regulation should clarify the application of intellectual property laws within the Metaverse, including copyright, trademarks, and patents. It should strike a balance between protecting creators' rights and fostering innovation and creativity.

Interoperability and Standards: Regulations should promote interoperability between different Metaverse platforms and encourage the development of industry-wide standards. This can enhance user experiences, enable seamless interactions, and prevent monopolistic practices.

Financial Regulations: As the Metaverse involves virtual currencies, digital assets, and economic transactions, regulations should address issues of taxation, anti-money laundering (AML) compliance, and fraud prevention to ensure financial integrity and transparency.

Jurisdictional Challenges: The borderless nature of the Metaverse poses jurisdictional challenges. International coordination and agreements may be necessary to address cross-border regulatory issues and ensure consistent rules for users and businesses operating within the Metaverse.

Examples of Metaverse platforms

To understand the meaning of the Metaverse, let us look at the leading platforms bringing this vision to life:

Decentraland: Decentraland is a blockchain-based virtual social environment. It is used to build, trade, earn money, and explore virtual worlds. It's essentially a digital ledger that permanently records bitcoin transactions across a network of computers and serves as the foundation for the universe of Decentraland. It provides exceptional opportunities for both studying and enjoying virtual experiences. Decentraland can be used to conduct meetings and trade in marketplaces for virtual goods, among other things. As in real life, interacting with other members is simple.

The Sandbox: It is a 3D virtual world hosted on the Ethereum blockchain where people may interact, build things, and make money. Numerous devices, including Windows phones and smartphones, are supported by Sandbox. With new virtual experiences, it provides people with chances for money-making. It is not inexpensive to use, though. To make this possible, SandBox has developed its SAND coin based on Ethereum. One can pay gas expenses on the Ethereum network can be paid with SAND tokens.

Bloktopia: Bloktopia uses virtual reality to provide users with an immersive experience. It is a 21-story virtual structure representing the 21 million Bitcoins currently in use. With new virtual experiences, it provides a variety of revenue-generating potential. People can design their avatars, participate in numerous activities, learn about cryptocurrencies, and purchase

virtual “real estate” in the tower. Using the platform’s builder tool, you can also utilize this real estate to make artwork, games, sequences, and other things.

Meta Horizon Worlds: Users can socialize, have business meetings, explore the virtual environment, participate in virtual activities, and play games on Horizon Worlds. One of Meta’s VR social apps is Horizon Worlds. In the Horizon universe, blockchain technology is not utilized. It features functional VR building blocks, such as code blocks, music, and animation effects, that aid content developers in addition to navigable VR settings. As a test platform for virtual explorers with an invite-only policy, Facebook (now Meta Platforms Inc.) first debuted Horizons in August 2020.

Metahero: The Metahero project offers practical technology that lets users scan actual objects and move them into the Metaverse rather than a virtual realm. It focuses on bringing physical artifacts into the digital world utilizing ultra-HD photogrammetric scanning technologies. With their 3D avatars, users can use Metahero as a portal to explore the NFT, social media, fashion, and other aspects of the Metaverse. Metahero creates ultrahigh-definition avatars from real-world things, including people.

The Metaverse will be among the key technologies to reshape the digital world in the next few years. So, it is so crucial for enterprises to prepare for this technology, strengthen blockchain capabilities, safeguard against Metaverse and blockchain security risks, and embrace a new era of the internet.

What are NFTs in the Metaverse?

NFTs are non-fungible tokens that represent someone’s ownership of digital assets such as social media posts, digital art, painting, signature, and so on. In addition to tokenizing the intangible or digital content, NFT can also represent the tokenized version of real-world assets, including land and building. Non-fungible tokens and the underlying technology of NFTs play a crucial role in developing the Metaverse. NFTs exist on the blockchain, which was initially useful to trade digital assets, and now it has diverse use cases. The NFTs play an important role within the digital environment of the Metaverse, NFTs integrate with existing VR and AR technology and thus regulate the whole space. It means that NFTs in the Metaverse can represent ownership for anything, including in-game assets, virtual avatars, and real estate properties (digital version). Similarly, Metaverse-based NFT marketplace allows the user’s avatars to explore the marketplace, take a closer look at the digital products, and choose the product of their choice.

How does NFT work in the Metaverse?

NFTs work in the Metaverse as real-world objects work in the existing universe. Simply put, NFTs are the key component of the emerging Metaverse where viability heavily relies on the tokenization of assets. Every Metaverse project, gaming or enterprise, has to blend NFTs and Metaverse to utilize their combined benefits. Some tech experts even consider Metaverse and NFTs corresponding with each other. NFTs have multiple utilities in the Metaverse. Let us explore the role that NFT plays in Metaverse’s 3D Virtual world and how they integrate.

- 1. Transparent and Fair Economy:** The fact that the blockchain-based metaverse is decentralised is what makes it a fair and a transparent digital ecosystem. It makes the sale of any digital asset ownable, sellable, and transferable within the metaverse without any control or permission from a centralised authority or entities. This is where NFT's function in the metaverse will grow more significant as it will aid in rendering actual ownership of digital goods leading to seamless transactions in the metaverse. Availability of NFTs will be based on the rule of supply and demand and this will not allow any channels to increase its price artificially. There will be scope for new crypto-economic models like play-to-earn games where there will be more opportunities for players to enjoy an impartial and equitable game play experience through ownership and control of assets.
- 2. Virtual Real Estate:** NFT plays a crucial role for the metaverse in terms of virtual land ownership. The metaverse constitutes digital pieces of real estate known as virtual lands. Here NFTs can be made use of to buy and sell lands in the metaverse. Digital structures can be rented out for online shops or events and owners can earn income passively. The Sandbox and Decentraland metaverses are virtual platforms where you can buy or sell lands/plots as NFTs.
- 3. Trading:** Trade and exchange activities of digital products such as images, videos, tweets, game assets, photography, and music are all done with the use of NFTs in the Metaverse.
- 4. Transfer of Ownership:** NFTs greatly aid in business operations such as transfer of ownership. Companies can now launch their products in the Metaverse and can easily transfer ownership of products to their customers in return for NFTs.
- 5. NFT Avatars:** You are very well aware that an avatar is a digital representation of yourself with which you can enter the metaverse. Although it is not a necessary requirement that your avatar is unique but in case you wish to do so, you will be able to own it. In fact, in the near future, the top profile picture (PFP) NFT projects like CloneX NFTS are working on converting the profile pictures of NFT art owners into their 3D avatars.
- 6. Community and Social Experiences:** NFT plays a pivotal role in enhancing users' social and community experiences in the metaverse. NFT avatars help users envisage what their fellow community members look like. In fact, NFTs can be perceived as an extension of users' real-life identities and reflect their preferences or choices in real life. Using NFT avatars one can get virtual membership to several real-world and metaverse experiences such as startup launches. Project communities with mutual goals can form a community by buying some form of NFT assets. This strengthens the relationship and ties between community members.
- 7. Marketing:** Realising the great potential of NFTs in the Metaverse, businesses have optimised their marketing efforts by advertising or selling digital products even before the physical ones are available for sale. This strengthens brand presence and reaches a wider target audience especially the younger generation.

How do NFTs shape the future of Metaverse?

NFTs can transform the way users interact with traditional social media paradigms and socialize with each other. Let's figure out how NFTs can disrupt the existing digital world:

1. A fair and transparent economy

Metaverse allows businesses and users to replicate and port real-world assets into the Metaverse's decentralized virtual space. One prevalent means of integrating more digital assets on the Metaverse is play-to-earn games. Such games drive engagement among the players and empower them by providing benefits like in-game lending and trade activities.

With NFTs, players can participate in play-to-earn games and earn their contributions. Most of these games involve guilds that act as intermediaries to purchase gaming assets, collectibles, land, and other properties. The responsibilities of guilds also include funding the players who ran out of capital.

This helps promote a transparent and fair economy as anyone can join play-to-earn games and earn yield even when they are just starting with zero capital in hand.

2. Next-generation of social experiences

Metaverse is here to redefine existing social experiences, and NFTs play a crucial role. Holding unique NFT avatars, users can prove their identity among various avatars available in the virtual space. Brands can use their NFT avatars to interact with targeted audiences, discuss the perspectives of their projects with like-minded people, and thus solve many problems.

Owing to the NFT avatars, social media users can meet the avatar of their connection or social media friend rather than having a text-based chat or video call. Since NFTs have non-fungible properties, each NFT avatar is unique and has a real-world identity. Plus, users have complete freedom to design and curate their personalized virtual avatars on the Metaverse.

3. Virtual real estate trends

Users can also buy virtual properties in the Metaverse like the real world. The underlying blockchain technology and NFTs let users hold ownership and develop virtual real estate based on their choice. Users have the freedom to buy and sell these virtual properties and rent them for passive income.

Moreover, they can build different structures such as online stores on the virtual land and utilize these spaces to host social events. Decentraland is one of the best practical examples of how virtual products are auctioned in NFTs. The idea of virtual real estate has attracted many industries as it enables the selling of tickets and merchandise online.

NFT Uses in The Metaverse

Because NFTs are generally associated with websites and transactions that occur through web browsers, and because the metaverse is mostly VR-based, there might be some confusion about what their common ground is — and whether there is any in the first place. Thankfully, despite the relative novelty of both concepts, several companies have already found creative and fruitful ways to use both simultaneously.

Virtual marketplace. With apps like VRChat, spaces for communication in VR are already thriving, and it is not a huge leap to assume that these spaces can also serve as a fertile trading

ground for NFTs. Sellers can easily provide links and previews to assets on the web or mint assets directly in the VR landscape. VR and NFT marketplaces can appeal to many brands in various industries, and Nike is a good example. It is already dipping its toes into the metaverse with its own virtual "Nikeland" and has now acquired a studio (RTFKT) known for making NFTs of products. Perhaps it is only a matter of time before we see the two concepts meet in "Nikeworld."

Art gallery. VR is perhaps the best possible platform (short of an actual brick-and-mortar building) for viewing art. You get to see it up close with every detail and from every angle. This type of solution differs from a marketplace because the prices are already set (and not negotiated), the assets are all of one type (art compositions) and the atmosphere is much more relaxed. For example, many museums are currently placing NFT artwork in metaverses such as Cryptovoxels, powered by the Ethereum blockchain. According to The Art Newspaper, Cryptovoxels hosts "art galleries and museums, including San Francisco Museum of Modern Art and the FC Francisco Carolinum Linz, Austria."

New frontiers. Real estate can be a pretty lucrative industry to work in in the physical world, and the same could apply to the metaverse. We are not referring to real homes being sold digitally but rather digital land and territories being partially or completely sold for further user development. This case is more easily illustrated with an example. Decentraland is a virtual territory where plots of land can be sold as NFTs, and everything is represented in 3-D. This "country" has its own cryptocurrency and is slated to enter the metaverse (make the world accessible to VR users) later in 2022.

What are the benefits of using NFTs in the Metaverse?

There are many benefits to using NFTs in the metaverse when compared to traditional methods of asset ownership. Here are some of the most notable.

More Secure

One of the biggest advantages of using NFTs in the metaverse is that it allows for a much more secure way to own and trade virtual assets. Since all transactions are recorded on the blockchain, there is no risk of fraud or theft. This is a big contrast to traditional methods of owning and trading virtual assets, which are often susceptible to scams and hacks.

Creates Scarcity

Another advantage of using NFT is that it can help to create scarcity. This is important for virtual worlds, as it can help to give items a sense of value. NFTs can also be used to represent unique items, such as one-of-a-kind pieces of digital art. This can help to make the virtual world feel more real and exciting for users.

Monetizes Assets

Finally, NFTs provide a way to monetize assets in the metaverse. This is important for developers and creators, as it can help to fund the creation of new content. NFTs can also be

used to create income streams for virtual world businesses. This can help to make the metaverse a more sustainable place for creators and businesses.

The Challenges with using NFTs in the Metaverse

There are a few challenges that need to be considered when using NFTs in the metaverse. One of the most important is how to represent ownership of assets. This is particularly important for virtual worlds, as it can be difficult to determine who owns what. Another challenge is how to ensure that NFTs are used in a way that doesn't create inflation. Also, it's important to consider how NFTs will be traded and sold. For example, will there be a central exchange or will trade happen directly between users? These are all important challenges that need to be considered when using NFTs in the metaverse. However, they are not insurmountable, and there are already several projects working on solutions.

Conclusion

NFTs have a lot of potential in the metaverse. They provide a way to represent ownership of assets, create scarcity, and monetize content. While some challenges need to be considered, such as how to represent ownership and prevent inflation, there are already several projects working on solutions. However, if these challenges can be overcome, then NFTs could play a big role in the future of virtual worlds.

Decentralized Society (DeSoc)

Introduction

In a world increasingly moving towards digitization, the essence of decentralization becomes paramount. It promises a system where power is distributed, reducing single points of control and potential failures. As we stand on the cusp of a new digital frontier, understanding decentralization and its implications is essential. From the early eras of centralized systems to the present age of web3, our progression has been notable. In this age, where the cryptocurrency and NFT markets have witnessed a turbulent journey, some of the brightest minds in the industry are veering toward exploring innovative concepts. Notably, Vitalik Buterin, in collaboration with Flashbots researcher Puja Ohlaver and economist Glen Weyl, has presented the community with a groundbreaking research paper titled, "Decentralized Society: Finding Web3's Soul". This research introduces the intriguing concept of "soulbound" NFTs, which, contrary to traditional transferable assets, anchors on non-transferable, enduring social relationships.

What is a Decentralized Society (DeSoc)?

Decentralized Society (DeSoc) is an umbrella term for traditional activities that will eventually get decentralized in the near future. Although it is a new web3 ecosystem known as the "Decentralized Society" (DeSoc), it attempts to produce a tamper-proof record of web3 users' identities and social connections in order to pave the way for a society with a variety of ideologies. In the modern economy, service providers look at a person's past to evaluate

whether they would be a trustworthy customer. People, in turn, rely on their existing records, including their financial and rental ones (IDs, credit ratings, degrees, and certifications). Essentially, the conventional economy significantly depends on reputation and authenticity to motivate consumer and service provider action.

In recent years, the idea of a decentralized society has gained increasing attention and popularity. A decentralized society is one where power and decision-making are distributed amongst individuals and groups rather than being concentrated in the hands of a few. The concept is often associated with blockchain technology and cryptocurrency, but its implications are much broader.

DeSoc aims to offer blockchain-powered track records for web3 users to encourage businesses to set up shop and help people access much-needed services. Through its innovative solutions called “Soul” and “Soulbound Tokens (SBTs),” which we shall discuss in the next section, the initiative intends to lay the groundwork for a reliable conceptual system that can power the decentralized economy.

In the pursuit of augmenting web3’s growth into a more inclusive, democratic and decentralized ecosystem, DeSoc will be instrumental. Now, transferable assets are dominating the web3 space which has its own limitations. With Desoc and SBTs, personal brand building and uncollateralized lending depend on social relationships that are non-transferable.

- Analyzing the credentials, ownership and other details of the SBTs will encode these social relationships.
- DeSoc can address many issues at the public governance level. Mechanisms such as property rights, competitive exams, property ownership etc. prevent extraction and dominance.
- DeSoc moves on from the existing hyper-financialized state of web3 to a more meaningful future of high returns across social networks and users.

Key Concept of Decentralized Society (DeSoc)

- Currently, web3 is primarily concerned with assets and financialized that are transferable.
- Nevertheless, numerous conventional economic acts (for example, “personal brand building and uncollateralized lending”) depend on social relationships that are non-transferable and are founded on faith and endure over time.
- The paper, “Decentralized Society: Finding Web3’s Soul” proposed non-transferable SBTs possessed by “Souls,” namely accounts, as a means in web3 to improve the encode of social relationship networks.
- By monitoring the “credentials, dedications, and alliance” of Souls on-chain SBTs will encode these relationships.
- DeSoc (Decentralized Society) may rely on SBTs to enable “souls and communities to get together bottom-up, as rising properties of one another, to co-develop plural network intelligences and goods at a variety of scales.”

- DeSoc, if persecuted, has the potential to set the stage for new governance mechanisms and property rights that “reward trust and cooperation during protecting networks from extraction, capture, and dominance.”
- Overall, DeSoc points away from the current hyper-financialized state of the web3 and toward a “more impactful, pluralist future of higher returns across social distance.”

Souls

A ‘Soul’ serves as DeSoc’s version of a web3 wallet, which users can utilize to accumulate and keep specialized assets called Soulbound Tokens or (SBTs). Think of it as a digital “envelope” for all your important digital records and certifications. Moreover, both individuals and organizations can use Soul to either keep SBTs or distribute these tokens to their intended recipients. There will not be any hard rules on how many Soul accounts people can have. Someone can own several Souls to organize their SBTs according to category. ‘Soul 1’ may hold SBTs for educational attainment, ‘Soul 2’ can keep SBTs gained from on-the-job (OJT) training, and so on.

Looking at the web3 problems we know that the emerging space lacks focus on two key areas: trusted identity and social relations. The combination of Souls and SBTs can potentially solve the blockchain space’s trusted identity problem.

Here is how: Fellow Soul owners can attest to a Soul’s authenticity and trust level. This counterparty measure helps verify if a Soul indeed has genuine SBTs as it claims. This solution is quite funny and clever, as we can already anticipate the army of crackpots who would soon attempt to game the system and gain an unfair advantage. Hasta la vista, web3 sock puppets. Moreover, this countermeasure is critical as Souls may soon evolve as a primary tool to prove someone’s credibility and authenticity in web3. Souls with a high number SBTs can command greater trust and likeability from the public.

In this new field, the number of credentials (SBTs) may become the new way of determining eligibility for various applications, which is why there need to be key mechanisms to mitigate any attempts to cheat the system. Soon, this promising Soul-SBT system may evolve as a critical part of any venture or initiative that highly depends on reputation, authenticity, and scarcity.

Soulbound Tokens (SBTs)

Soulbound Tokens (SBTs) are non-transferrable tokens designed to serve as “certificates” that provide people with proof of their educational attainment, expertise, or other achievements in order to form their identity, or as we call it, their “Soul”.

The DeSoc concept made SBTs non-transferable assets to prevent anyone from selling these tokens (basically selling credentials), which would defeat the purpose of building an authentic system for society. But even though these tokens run on a blockchain, the platform hinted that SBT issuers could possibly be able to revoke these certificates from the recipients. While the blockchain can accurately pinpoint an asset’s exact date of issuance, it is not enough to verify something’s authenticity.

This is where SBT comes in.

To provide another layer of verification, SBT will trace the “social provenance” of Souls, preventing sophisticated frauds from taking place in the Soul-SBT system. Social provenance serves as the “map” or the “picture” of a Soul’s social interactions, which consist of certificates or SBTs an owner has accumulated. But there is always a risk of malicious actors attempting to cheat the system by creating Souls with the same SBTs within them. To combat this fraud, SBT allows holders to clearly see a Soul’s social provenance or how rich its social interactions are. This social richness is quite hard and time-consuming to counterfeit, making it a trustworthy criterion.

Two Souls may have the same number of SBTs, but the richness of their social connections will differentiate the authentic from the fake.

Paramount Significance of DeSoc

DeSoc is a profound shift in the way we perceive and interact with the digital realm. Its transformative potential is evident in its promise to pivot away from the prevailing hyper-financialization of web3 and instead champion a broader, more pluralistic, and equitable digital future. Historically, the birth of web3 was rooted in decentralizing finance, empowering individuals with autonomous control over their assets. This foundational concept aimed to break away from traditional centralized financial systems. As time progressed, the aspirations for web3 expanded beyond finance, paving the way for its applications in more intrinsic societal fabrics such as justice, governance, identity, and even technology itself.

DeSoc is the epitome of this evolution. By embracing a decentralized ethos, it offers a blueprint to revolutionize sectors far and wide. Imagine a world where justice is not confined to centralized institutions but is collectively determined by communities, ensuring fairness and representation. Think of governance not as a set of top-down mandates but as dynamic, adaptable, and co-determined by its participants. Envision identity not as a static construct but as a fluid, self-sovereign entity, rooted in trust and verifiable credentials. And consider technology not as proprietary silos but as open, collaborative platforms built for and by the people.

Taking a step back and viewing this through the lens of history, one can observe a clear trajectory. From the early days of human civilization to the present, there has been an inexorable move towards decentralization. Whether in governance structures, economic systems, or technological innovations, the narrative of history underscores humanity’s quest for greater autonomy, inclusivity, and fairness. This is not merely a trend but an embodiment of an enduring human spirit, driven by a desire for collective progress.

Four Pillars of a Decentralized Society

Let us explore the **four pillars of a decentralized society: decentralized communication, decentralized law, decentralized production, and decentralized finance.**

Decentralized Communication

It is the first pillar of a decentralized society. In a centralized system, communication channels are controlled by a few powerful entities, such as governments, corporations, or social media companies. These entities can manipulate the flow of information to their advantage, censor certain voices, and even distort the truth. In a decentralized system, communication channels are open and accessible to all, and no single entity has the power to control or manipulate them.

Blockchain technology has enabled the creation of decentralized communication networks, such as the blockchain-based social media platform Steemit or the encrypted messaging app Signal. These platforms use a peer-to-peer architecture, where users communicate directly with each other without the need for intermediaries. This not only promotes free speech and privacy but also reduces the risk of cyberattacks and data breaches.

Decentralized Law

This is the second pillar of a decentralized society. In a centralized system, laws and regulations are made and enforced by a government or a ruling authority. This can lead to a lack of transparency, accountability, and responsiveness to the needs of the people. In a decentralized system, laws and regulations are created and enforced through a bottom-up process, where individuals and communities collaborate to establish common rules and standards.

Blockchain technology has also enabled the creation of decentralized legal systems, such as smart contracts. Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist on a decentralized blockchain network, making them tamper-proof, transparent, and accessible to all parties involved. This eliminates the need for intermediaries, such as lawyers or courts, and reduces the time and cost associated with legal disputes. Refer to the blog to find out more about smart contracts.

Another example of decentralized law is the concept of decentralized autonomous organizations (DAOs). DAOs are organizations that are run through rules encoded as computer programs on a blockchain. Members of a DAO can vote on proposals and make decisions collectively, without the need for a central authority to make decisions for them.

In the current web3 space, almost all the projects are creating their own DAO which basically comprises the governance token holder. The DAO members have the authority to make changes and contribute to the platform's growth.

Decentralized Production

In a centralized system, production is controlled by a few powerful corporations, often with little regard for social or environmental sustainability. This can lead to the exploitation of workers, depletion of resources, and environmental degradation. In a decentralized system, production is organized in a way that maximizes social and environmental benefits while minimizing negative externalities.

Blockchain technology has enabled the creation of decentralized production networks, such as the blockchain-based supply chain platform Provenance or the decentralized renewable energy marketplace Power Ledger. These platforms enable producers to demonstrate their

sustainability credentials and enable consumers to make informed choices about the products they purchase. They also enable producers and consumers to engage in peer-to-peer transactions, bypassing intermediaries and reducing transaction costs.

Decentralized production is made possible by the use of smart contracts, which are self-executing programs that run on a blockchain. These contracts can be programmed to automatically execute specific actions based on predefined conditions, without the need for intermediaries.

One example of decentralized production using blockchain technology is the supply chain management of agricultural products. Blockchain can be used to track the entire journey of a product from the farm to the store, ensuring transparency and traceability. This can help prevent fraud, reduce waste, and increase efficiency.

Another example of decentralized production is the creation and distribution of digital content. With blockchain, content creators can directly sell their work to consumers without intermediaries, such as music streaming services or social media platforms. This can lead to fairer compensation for creators and greater control over their work.

Decentralized production can also be used in the energy sector, where blockchain can be used to enable peer-to-peer energy trading among households with solar panels. This can reduce the reliance on centralized energy providers and increase the use of renewable energy sources.

Decentralized Finance

In a centralized system, the financial system is controlled by a few powerful banks and financial institutions, often with little regard for the needs of the people. This can lead to financial exclusion, inequality, and instability. In a decentralized system, the financial system is organized in a way that maximizes inclusivity, fairness, and stability.

Blockchain technology has enabled the creation of decentralized financial networks, such as the blockchain-based payment platform BitPay or the decentralized lending platform Aave. These platforms enable individuals and communities to access financial services without the need for traditional banks or financial institutions. They also enable individuals and communities to participate in peer-to-peer lending and investment, bypassing intermediaries and reducing transaction costs. A decentralized society is one where power and decision-making are distributed amongst individuals and groups rather than being concentrated in the hands of a few.

DeFi has seen immense growth in the past years with almost \$150 Mn in TVL and 1000s of protocols being deployed on the chain daily. With central banks collapsing in recent years, people are inclining more toward Decentralized protocol where there is capital is not under the control of a single entity rather the transactions are done peer-to-peer. To know more about DeFi protocols, refer to the blog by TradeDog.

Is DeSoc just a myth?

The idea of a decentralized society may have seemed like a myth just a few years ago. However, with the advent of blockchain technology and the introduction of decentralized finance, law, and more, it is becoming more of a possibility. The potential benefits of a decentralized society include increased transparency, reduced corruption, and enhanced autonomy for individuals. While it is still a work in progress and there are challenges to be addressed, the emergence of decentralized systems indicates that we are moving closer to a more equitable and decentralized world. With continued innovation and collaboration, we may one day see a truly decentralized society.

What are the Potential Applications of DeSoc?

Decentralized Society (DeSoc) protocols are still being developed today, but multiple use cases have already been recognized. Over time, we will likely see projects being built around these concepts.

Currently, the top use cases we have recognized are:

1. Verifying Scarcity, Reputation, or Authenticity
2. Censorship-Resistant Credit System
3. Souldrops
4. Provide better Governance for DAOs

Verifying Scarcity, Reputation, or Authenticity

Today, the web3 space still lacks robust standards in identity, reputation, and authenticity verification, preventing entities from identifying trustworthy users. To recap, DeSoc's innovative solutions help web3 users gain an authentic identity that can prove and measure their trustworthiness.

With the creation of tamper-proof track records, more companies, organizations, universities, etc. would be willing to accommodate web3 users and serve their needs. Why? Because they can immediately see a person's track record and determine if they're the right candidate for their respective applications.

Through DeSoc's 'Soul' and 'SBTs', more firms can potentially be motivated to roll out their services in a decentralized community as they can finally have a trusted verification system to lean on.

Censorship-Resistant Credit System

In today's economy, people's credit scores are handled by centralized entities like TransUnion, Equifax, and Experian, which use varying methods to compute these numbers, which affect an individual's ability to borrow money, command lower interest rates, and have greater negotiating power. While we can assume that these organizations will always produce accurate and unbiased scores for the masses, unfortunately, it hasn't always been the case. Since the methods, formulas, and considerations they are applying come only from a handful of people, they can potentially tip the scales in favour of their biases. In other words, a centralized credit

system is always prone to potential rigging due to censorship or discrimination, among other motives.

This is where SBTs come in, again.

Basically, SBTs can turn a centralized credit score system into a (de)centralized one, moving from a few decision-makers to a community of SBT holders. In the Decentralized Society system, a person's creditworthiness will be determined, not by mere scores, but by the quality (richness) and variations of the SBTs they hold. As an example, SBTs for educational background, career, business awards, and great payment history can clearly show someone's eligibility to take out a loan. Think of it this way. Instead of checking credit score, a credit provider will instead ask for certificates to determine if someone indeed trustworthy for the loan. And the blockchain nature of these certificates or SBTs, which cannot be tampered with, adds to the authenticity and trust of the entire process.

Souldrops (New and Improved Airdrops)

You must have heard of “airdrops,”? These are web3 teams' way of kickstarting and hyping their projects by randomly giving away their NFTs or tokens en masse. Despite its random distribution, people can increase their chances of getting that free item by interacting more with the project's platform or product. In short, the more they use a project's services, the higher their chances of winning an asset.

Unfortunately, people can cheat this system through a fraudulent act known as a Sybil Attack, which involves creating multiple accounts or digital wallets to magnify one's influence on a platform. This attack is prevalent in the web3 space; in fact, one user can possibly create more than 100,000 private keys (accounts) per second, making it a powerful tool to gain a drastically unfair advantage in winning airdrops, or any decision-making process that requires community voting.

To derisk, DeSoc has put forward its own version of airdrop called “Souldrops.” In this improved system, a Soul owner can distribute a free digital item to other Souls with specific numbers and types of SBTs. For example, a tech conference may Souldrop limited-edition NFTs on Souls with SBTs on previous web3 events or SBTs from its sponsors.

A Souldrop allows a person or a project to distribute free items on wallets (or, in this case, Souls) with specific attributes that match their requirements. This system is a lot harder for bad actors to successfully execute a Sybil attack on.

Provide Better Governance for DAOs

Decentralized autonomous organizations (DAOs) equip governance token holders with the power to vote on critical issues of web3 projects. Through this, decisions come from the community and not from a few selected people in an organization.

While it is a more innovative structure, the blockchain community has found DAOs to be also vulnerable to Sybil attacks, the fraudulent activity we discussed earlier. But a Sybil attack is

actually more dangerous when used against a DAO, as it can potentially change key policies on its underlying protocol and even divert tokens from an intended destination.

By simply creating multiple wallets, a single person or a handful of people can easily outnumber the genuine members of the voting community. With multitudes of fake wallets on their hands, bad actors can outvote the community and select choices that could benefit their vested interests.

DeSoc has developed a solution to mitigate this enormous risk.

It will first “scan” a voting Soul’s SBTs to determine if it is a genuine voting member of the community or a false online identity. Remember, a DeSoc system is designed to detect a fake Soul based on its lack of a rich and diversified collection of SBTs. If a fake Soul is found, it will automatically be filtered out.

Another solution DeSoc has is to increase the voting power of Souls that possess more reputable SBTs in various areas, including education and career.

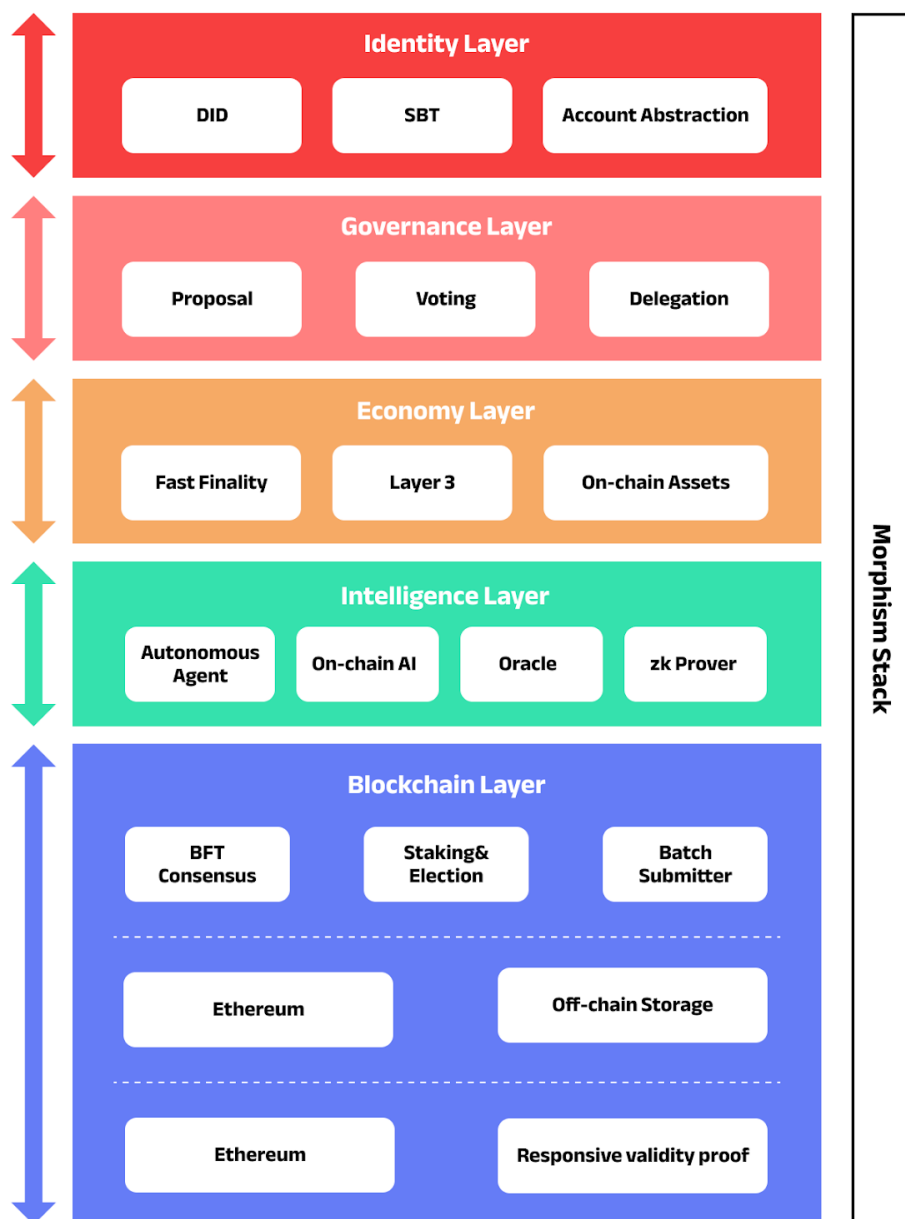
Morphism: A Seamless, Scalable, and Secure L2 Pioneering DeSoc’s Future

Morphism stands at the forefront of decentralized innovation, crafting the technological bedrock that underpins the DeSoc ecosystem. It is not just a platform but a vessel for diverse social experiments, offering a public domain where the ideals of DeSoc can be freely explored and realized.

At its core, Morphism is a sophisticated Layer 2 solution designed atop Ethereum, which is recognized as the most organic and decentralized public blockchain to date. But Morphism’s ambitions reach far beyond the typical Layer 2 scope; it is a comprehensive technology stack designed to energize and support every sector of DeSoc.

The Morphism Stack: A Five-Layered Technological Ecosystem

Each of the five critical sectors identified in the DeSoc framework is meticulously catered to by the Morphism stack, resulting in a robust and synergistic technological ecosystem designed to empower and interconnect the roots of a decentralized society.



Identity Layer:

At the top of the stack, Morphism champions advanced technologies for identity within DeSoc, including Decentralized Identities (DIDs) and Soulbound Tokens (SBTs). These tools are crafted to encapsulate the social and individual essence, fostering a closer connection between blockchain technology and real-world identities through account abstraction.

Economy Layer:

Morphism ensures a swift and secure economic landscape with rapid finality and trusted transaction confirmations. EVM compatibility allows for the deployment of diverse assets and

financial applications with ease and cost-efficiency, underpinning robust economic activities on the blockchain.

Governance Layer:

Morphism's governance is bifurcated into infrastructure governance at the foundational layer and social governance at the application layer. Leveraging mature consensus mechanisms, Morphism facilitates exemplary collaboration and communication among the custodians of the infrastructure, setting a precedent for on-chain social governance through advanced collaborative technologies and governance tokens.

Intelligence Layer:

In the DeSoc paradigm, human intelligence and AI coalesce to form a composite, pluralistic intellect. Morphism serves as the conduit for AI interaction with both digital and real-world domains, predicated on the principles of permissionless engagement and openness. It empowers on-chain agents to act autonomously, fostering decentralized interactions that are intent-driven, and providing genuine, unrestricted feedback loops for AI optimization.

Blockchain Layer:

The bedrock of the stack, Morphism's blockchain layer, is a testament to the enduring quest for decentralization. Confronting the inadequacies of current blockchain systems, Morphism deploys an optimistic zkEVM and decentralized sequencers within its Layer 2 framework, striving for the pinnacle of decentralization and security. In tandem, it offers an Ethereum-like development experience, nurturing a fertile ground for the blossoming of DeSoc applications and infrastructures.

Summing up

For now, DeSoc remains a concept and a field of study rather than something we can dig into in the wild today. Yet via Ethereum and NFTs, we already have the basic infrastructure required, and these technologies will continue to advance too. And through this "Decentralized Society" paper, we already have the basic blueprints, not to mention many projects are starting to explore soulbound NFTs. There is still a long way to go before DeSoc really arrives, but now after Vitalik's paper it feels clearer than ever that the future of NFTs will be more expansive and more social than many of us could have ever imagined before.

References

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What is the metaverse? - YouTube



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<https://www.youtube.com/watch?v=hHmXhxxx8Dw>