

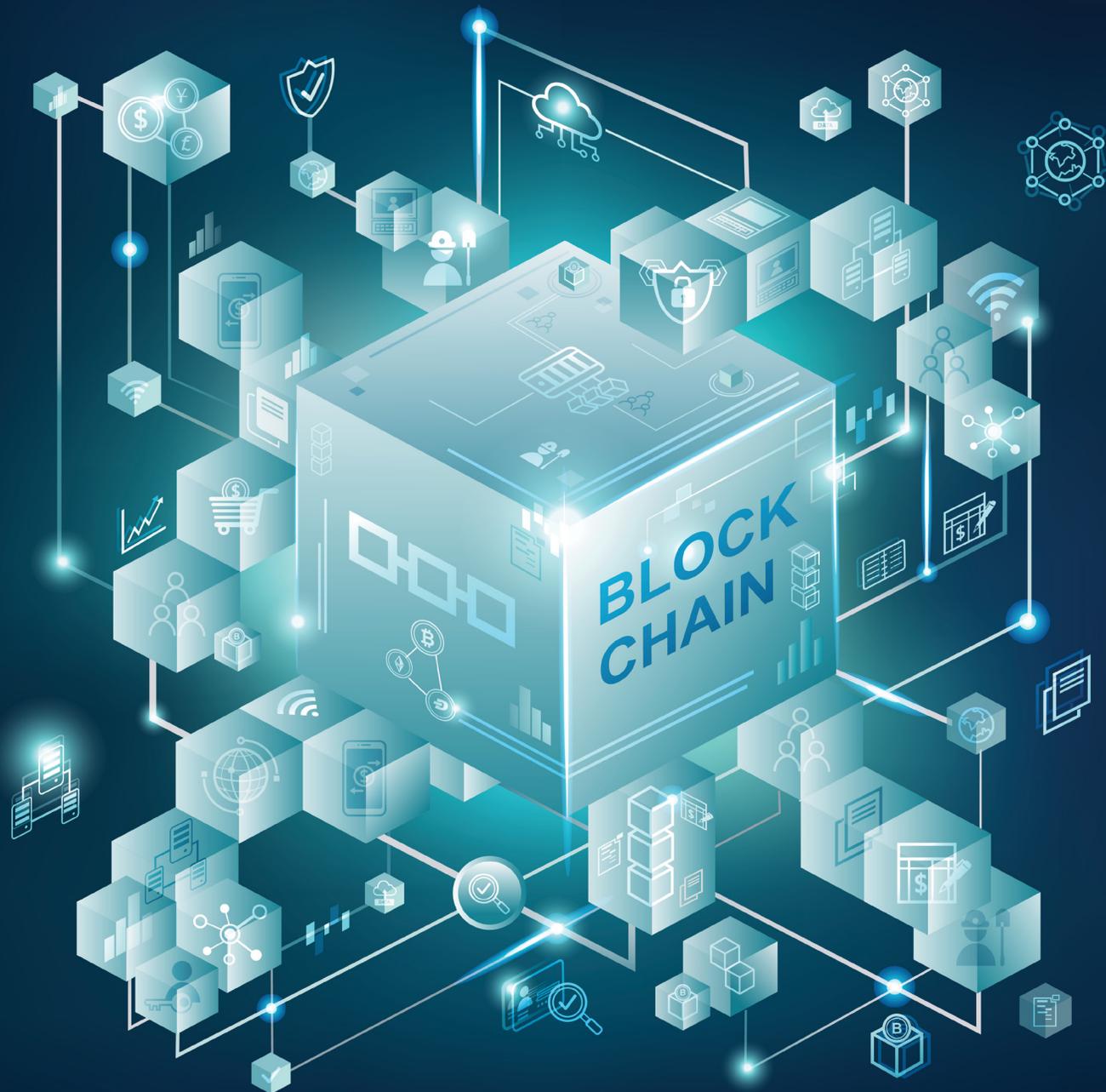


# BLOCKCHAIN FOR METAVERSE

## Abstract

Web 3.0 is the next wave of the Internet and is poised to create a paradigm shift with the concept of decentralized networks. Metaverse is a virtual world built on the foundation of blockchain and decentralized networks.

This paper provides a point of view about metaverse and how blockchain enables it. It also focuses on the distributed ledger technology or DLT-based metaverse platform envisioned by Infosys to support organizations in this new technology journey.



**Blockchain**-based innovation has evolved at a rapid pace over the last few years. Blockchain is being leveraged for non-conventional, innovative use cases and digital tokens. In today's world, blockchain technology is gaining traction as a means to enable innovation in complex multi-party workflows that would have previously been virtually impossible. Cryptocurrencies such as Bitcoin, among the earliest blockchain applications, are witnessing increasing adoption and have even been accepted as legal tender in some parts of the globe. While a majority of cryptocurrencies

and most digital assets are fungible, there is another digital asset hosted by blockchain called non-fungible tokens (NFTs). NFTs became a rage in 2021 and gained popularity in sports, arts, and real estate. NFTs are also being embraced in the financial services and retail industry.

Multiple industries including financial services, manufacturing, healthcare, and telecom are increasingly harnessing blockchain in many ways to derive savings and generate new revenue streams from decentralized multi-party networks and ecosystems.

Decentralized data networks based on blockchain form the core foundation of Web 3.0. Riding on the adoption of blockchain which is a type of distributed ledger technology or DLT, Web 3.0 is driving the next paradigm shift in internet applications.

Blockchain is also being leveraged to facilitate a major shift in interaction in the virtual world with the concept of metaverse. The core pillars of blockchain namely decentralization, transparency, and immutability, make it a key enabler for metaverse in the ambit of Web 3.0.

**Metaverse** is an immersive virtual world which was coined in a 1992 science fiction novel "Snow Crash". Metaverse is a parallel digital world unconstrained by the laws of physics. This world offers social, gaming, educational, entertainment, and business avenues to its participants. It exploits blockchain for the crypto economy, digital ownership, provenance, and digital commerce as features across different implementations.

Real estate is now finding virtual representation in the form of NFTs that make it possible to fractionalize high

value properties and allow multiple parties to own a portion. There are real estate companies now operating in a metaverse that allow sale-purchase of virtual digital parcels. The ownership, provenance, and trust are ensured by the blockchain technology that forms the foundation of such metaverse ecosystems. The currency used in such ecosystems is typically a cryptocurrency, or a closed-circuit token maintained on blockchain for the ecosystem.

The COVID pandemic has revolutionized the workplace with most companies

offering remote working options to employees. This forced the corporate world to adopt virtual calls instead of in-person meetings. Bill Gates has predicted that most virtual meetings will evolve from 2D camera image grids to the metaverse – a 3D workspace with workers using digital avatars. Several software product companies are working on creating virtual world elements to make up the metaverse that will soon become mainstream. In time, the metaverse will make remote work seem less remote.

**Decentralized autonomous organization (DAO)** is another unique application of blockchain in the metaverse. DAO is a virtual organization that can be brought to life by DLT in a virtual landscape. DLT simulates the nervous system of the DAO, supporting the organization's rules and processes as well

as member and stakeholder identities and privileges. It drives management of transactions across various entities in a trustworthy and transparent manner.

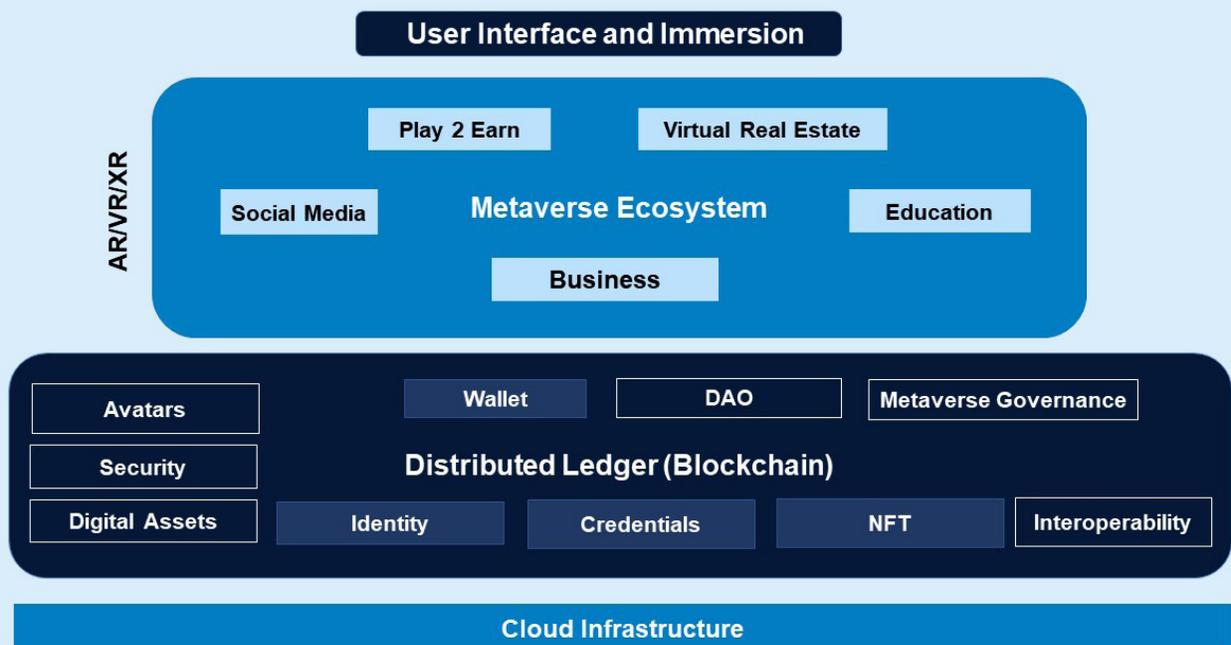
Finally, despite being decentralized, DLT offers robust inherent security features. Any data/transactions persisted

on DLT are cryptographically hashed with one-way encryption, which makes DLT immutable. Additional levers of role-based access control (RBAC) and public key infrastructure (PKI) techniques may be applied to implement further security controls.

**Infosys** has visualized a generic DLT layer for metaverse, as a core infrastructure offering. The DLT layer includes reusable blockchain-based metaverse ecosystem modules such as NFT, identity, wallet, and credential management. This layer is industry-agnostic and accelerates turnaround for any metaverse implementation. The DLT layer can also be enabled for interoperability to allow for cross pollination of digital entities or assets across metaverses.

Governance of metaverses is best managed using DLT smart contracts based rules, ensuring transparent, automated, and seamless application of rules in a public, permissionless ecosystem that can be entirely trusted by its participants.

## Industry-agnostic DLT Metaverse Platform – Functional Architecture



## Conclusion

Web 3.0 is the next wave of the Internet and is riding on the foundation of decentralized networks. Blockchain technology is being used widely to enable transactions in a virtual world. Metaverses built on blockchains are gaining traction as immersive worlds that offer opportunities for business, social interactions, education, and gaming. Blockchain has multiple uses across industries, and businesses are keen to adopt the concept of distributed ledgers for their specific needs.

In such a scenario, transparency, trust, and security are key enablers for adoption. Infosys has visualized a DLT layer that enables credential management and interoperability between metaverses. In addition, DAO can be enabled to further enforce rules and privileges to conduct transactions in a reliable and trustworthy manner across networks.

## About the author

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Rohini is a seasoned technology leader with rich experience in technical consulting and delivery across technology and industry domains. She has extensive experience in managing large accounts, incubating and developing new practices, and sustaining delivery excellence. Her passion for technology coupled with all-round delivery experience are key to the rigor she brings in driving innovation in her portfolio. As Practice Head for the blockchain service line, Rohini is responsible for thought leadership, design of disruptive solutions and consulting for blockchain-led business transformations across industry verticals.

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