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# **ITIHAASA POINT OF VIEW**

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# WEB3 AND INDIA

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IT architectures have evolved over the years – from mainframes to IoT, from a computing perspective; and from Web1 to Web2 to now Web3, from a consumer's (of computing) perspective. In this article, we will delve deeper into the world of Web3. We often encounter phrases like cryptocurrency, blockchain and Non-Fungible Tokens (NFTs) used in this context. We will understand what they mean, and what Web3 means for India.

#### The evolution of the Web – Web1, Web2 and Web3

Tim Berners-Lee invented the World Wide Web in 1989, which was later released to the general public in 1991. The Web1 era, between 1991 and 2004, had web-users visiting simple websites to consume content, in the form of basic text or images. Soon companies like Yahoo, Hotmail, and Google started building on top of open Internet standards and communication protocols to offer services like web search, email, and news aggregation that a majority of users wanted.

The Web2 era began from the mid-1990s, when Amazon created their book selling website in 1994 and Google introduced its search service in 1997. Think of Web2 as an interactive and social web. It allowed users to easily become creators on the web – uploading a video, writing a blog post, commenting or liking a post and so on. Indians are among the largest users and creators in Web2, given the size of our population and the recent penetration of mobile Internet. There are now over 800 million Indians who have access to Internet.

The era also saw the emergence of siloed, centralized services run by companies like Google, Apple, Amazon, and Facebook, which became all powerful. A key element of Web2 is that these companies control the entry points to the Internet or create their own walled garden. They also allow others to create new services on these platforms and control and charge for entry. While Web2 unleashed a lot of individual creativity and collective innovations, it also introduced several challenges in the form of an asymmetry in value creation between users and companies, privacy, and security. Although many of these platforms are free to use, companies monetize the users' data through an advertisement-based model, and by allowing other third-parties to publish content, apps and services on these platforms. Individual creators enjoy only a very small portion of this monetization, if at all. While users may enjoy the network externalities within a platform, they cannot easily take their data and move away to a different platform.

We are now at the dawn of the Web3 era. It borrows the open standards of the Web1 and user creation from Web2. Web3 is owned by the builders, creators and users who also appropriate all the value. Three important principles define Web3 for the users:

- Web3 is open and decentralized. It is created with open-source software developed by an open and accessible community of developers and users, instead of being dependent on private software infrastructure providers. Web3 runs on a blockchain or a peer-to-peer network of computers as opposed to a commercial cloud service.
- 2. Web3 does not need a trusted intermediary a role played by the large platform companies today. Users interact publicly or privately on Web3 network without intermediaries.
- 3. Web3 is permissionless. In its current form there are no governing institutions. Anyone who likes the objectives of a blockchain can participate in building or using it. Some entity has to create the standards and protocols. If they are for-profit entities, they can become the new gatekeepers of Web3, like how it is in Web2. There are also exchanges that allow movement of data, content and other digital assets from one open-source protocol to another.

## **Technical Building Blocks of Web3**

Let us a take a brief look at the key technical terms used in the Web3 context.

- A blockchain is the bedrock of Web3's architecture. It is a distributed database that is shared among the nodes of a peer-to-peer computer network that collects and stores information. All information in Web3 is bunched together in groups or blocks. When the required information is filled into a block, the block is closed and linked to the previous block. This forms a chain of data known as the blockchain. New information that follows this block is compiled into a new block that is added to the chain.
- Blockchains have smart contracts or *decentralized applications (dApps)* associated with them. These are programmable, and self-executing code is used to process and manage the various transactions.
- **Tokens** are examples of information that is stored in a blockchain. They represent fungible tradable assets, often in the form of cryptocurrencies. These tokens are held in digital wallets.
- User ids in Web3 dApps are related to a user's *digital wallet* address. Users use their wallet-ids to access cryptocurrencies, decentralized finance (DeFi) apps (that provide financial services like loans to users), games, NFTs (that are very specific assets like an electronic art of a digital photo).

We argue that such a definition of the building blocks of Web3 is popular among the IT pundits in the West. India, through its digital public goods / public IT stacks, has articulated a different set of building blocks of the Web3 vision. We will look at that shortly.

#### Web3 provides us with a new canvas for economic activity

By focusing only on the technical aspects, like cryptocurrencies and NFTs, we may be missing out on a much larger transition of the web and the associated opportunity we have to build the next web.

In the current context, founders of a web startup typically incorporate a company and look for angels and VCs to fund them by taking an equity stake based on the power of their business model. A startup in Web3 can have a very different beginning. Like-minded builders and users can come together on Web3 based on a common idea or a problem and can start a "company" called DAOs (Decentralized Autonomous Organizations).

At the heart of the DAO is a Web3 blockchain project. The project funds itself by allocating a certain number of tokens. For example, 15% of these tokens to initial builders, 20% to initial creators, 15% to initial users, the remainder 50% for future builders, creators and users. All current stakeholders can vote with their tokens on proposed changes to the project. The stakeholders can sell some of their tokens to profit and invest in other Web3 projects or convert them into money. Stakeholders who have a long-term vision in the project can buy or hold on to their tokens.

This is a different approach to set up ownership and sharing rewards of ownership that what currently exists. We need to prepare and educate ourselves, especially the community of builders, creators and users, on the economic concepts underpinning DAOs to leverage the full power of Web3.

Given that the core of Web3 is open source and low cost, many DAOs are formed without requiring a round of fund-raise from a VC or through funding by the community itself. VCs are focusing on Web3 layers that make it easy to access and work with this core – crypto exchange, DAOs, DeFi, infrastructure, NFTs, games, etc. India focussed VC funding in Web3 is now about USD 600 million.

At a more fundamental level, we also believe that Web3 provides an opportunity to use our data to benefit us rather than be used to monetize third party platforms. In Web3, the user's identity is not tied to a specificapplication or company. In fact, the user could choose to be anonymous, without linking it to any identity from the Web2 world (say a Twitter handle, a Facebook account etc.). This enables greater privacy, greater control on one's digital identity and facilitates individual data ownership.

#### Indian model for public platforms

This new Web3 model can work well in the Indian context to solve real world needs. The real growth will happen when Web3 moves out of its current Indian presence in Bangalore's high end gaming laptops to the laptops and mobile phones of builders, creators and users in Bharat. Let us consider a community of young painters from all over the world who want to learn from the experienced Madhubani art teachers.

- The teachers, students, and patrons of Madhubani art, Web3 developers, etc. can come together and form a DAO to pre-record videos that teach the Madhubani technique.
- Each video on a blockchain is accessible via. tokens.
- The DAO can scale by allowing users who are not part of this community to use "gas" (user fees equated to amount of computational effort required to execute specific operations) if the video sessions are in a dApp hosted on an environment like Ethereum.
- Students who have learnt the technique would exhaust their tokens and a new set of students who are interested in learning the art form can join the dApp and obtain new tokens.
- Apart from an initial set of tokens allocated to teachers for recording videos, they can also get tokens as and when new students join akin to course fee. These tokens can be exchanged for money on a cryptocurrency exchange.
- In such a model, all transactions are direct between different individual stakeholders, without a need for third party intermediaries like a Web2 video hosting platform, payment platforms, or an edtech company. Thus, a greater share of value accrues to the Madhubhani artist.

The digital public goods or the public IT stacks that India has developed such as Unified Payment Interface (UPI for financial payments) and Unified Health Interface (UHI for digital healthcare) are also unique illustrations of the Web3 principles of open, decentralized and federated architectures. Let us consider the public IT stacks supporting financial payments in India in greater detail.

- The mechanism is protocol driven these protocols are open to all; any company can leverage the protocol and create a payments application which a consumer may use.
- The identity of the consumers (payers and payees) is authenticated by their respective banks, with the eKYC process being driven by Aadhaar (India's identity platform). In this unique model of Web3, the public IT platform plays a role of a trusted intermediary, a requirement in the prevalent levels of low digital literacy in India.
- Since the transactions conform to standards set in the UPI protocol, they are matched by the respective banks without a need for any intermediary wallet / financial services player.
- Data sharing in the ecosystem conforms to the Data Empowerment and Protection Architecture (DEPA). DEPA's technology architecture is a consent-driven, interoperable, secure, and privacy preserving framework for data sharing.

A similar scenario prevails in the case of UHI too. The protocol ensures that a digital health service can be delivered between any end-user applications (digital app providing telemedicine service, AarogyaSetu etc.) with any health service provider (individual doctors, hospitals, labs etc.) in the healthcare ecosystem.

### **Risks in the Web3 model**

While we have examined thus far the several advantages of Web3, we should also consider some risks inherent in this model. Just because Web3 leverages code-based trust models or creates decentralised autonomous organizations, it doesn't mean that the model is flawless. For instance, the anonymity afforded by the model has encouraged bad actors – criminals, drug lords, and scam artists – to embrace crypto-currencies. In DAOs, tokens that act as voting-rights may be bought. Thus, affluent individuals may be able to influence decisions on Web3 much more than normal users. Researchers have argued that Web3's commitment to 'cryptoeconomics'—the use of economic incentives to guide user behaviour – imposes several governance limitations on the model. A due-diligence process that maps different ways in which Web3 might harm individuals and communities should be undertaken. Bad actors will come into any popular virtual environment if they see an opportunity to make money illegally.

In conclusion, let a positive outlook of exploration, within a large sandbox and a framework of governance guardrails, define India's Web3 quest. Let us imbibe what the Web3 community believes in, WAGMI - We're All Gonna Make It!

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