Blockchain Technology: The Bridge to Web 3.0

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The invention of the internet has radically changed the world order. From globalization to hyperconnectivity and digitalization, it has been driving change since inception. It is currently preparing for a paradigm shift that will arm everyday users with capabilities and computations reaching far beyond the trajectories of Web 1.0 and 2.0 combined.

By returning data ownership and reshaping human-machine interactions, the third generation of the internet promises an interconnected future. Parallels are drawn between blockchain and the first boom of the internet, with blockchain and its underlying technologies being the driving force behind the next generation of the World Wide Web.

The next frontier of the internet's evolution, Web 3.0, promises a decentralized, permissionless and open-source alternative that will transform computing, data storage and peer-to-peer transactions.

For one, it will eliminate freeloading third parties, giving back the ownership of private data and enabling users to monetize it as a product.

Second, Web 3.0 will enable fractionalized and mutual digital ownership of property, assets, organizations, and everything in between — leading to a trustless, global macroeconomy, where participants can collaborate toward common incentives.

Third, tomorrow's companies and organizations will become more resilient, where each stakeholder is a partial owner.

The evolution of the web

The internet was invented for military purposes in the 1960s before serving scientific communication.

Web 1.0 (1993 – 2005) A one-way communication channel between website owners and users

The original internet was released to the public on April 30, 1993. Web 1.0, also known as the web of cognition, was a one-way communication channel between website owners and users, where websites consisted of static, read-only HTML pages. It was the initial iteration of the web when web pages were static and users were not able to actively interact with each other through the Internet.

Users can't communicate with the websites beyond reading their content. Web 1.0 quickly started developing in the public domain, as it started to shift toward its successor in the 1990s.

Web 1.0 didn't have algorithms to sift internet pages, which made it extremely hard for users to find relevant information. Simply put, it was like a one-way highway with a narrow footpath where content creation was done by a select few and information came mostly from directories.

Web 2.0 (2005 – present) An interactive and interoperable internet

Web 2.0, made the internet a lot more interactive with the advancements in web technologies like Javascript, HTML5, CSS3, etc., which enabled startups to build interactive web platforms.

Also known as the social web, it represents a more interactive and interoperable internet, where users can interact with websites via server-side processing, online forms, and social media. It eventually gave rise to Web 2.0 corporate juggernauts like Facebook, Twitter, and YouTube, increased emphasis on user-generated content and interoperability between sites and applications. Websites on Web 2.0 are more dynamic, emphasizing participatory culture where any user can disseminate information.

The centralized websites of Web 2.0 also represented the rise of ads, making the consumer of the previous web, the product of website owners.

New businesses and business models were born – from social networking to mobile apps, Web 2.0 had introduced new income streams that were not possible in the days of Web 1.0.

Now, after more than two decades of existence, an even more powerful version of the Internet looks to take over.

Web 3.0 The semantic web with near-human-like intelligence

Web 3.0, called the semantic web by the World Wide Web inventor Tim Berners-Lee, is the next frontier of web development that will likely be based on AI, IoT and blockchain technology.

It would make the internet more intelligent or process information with near-human-like intelligence through the power of AI systems that could run smart programs to assist users. As such, content creation and decision-making processes will involve both humans and machines. This would enable the intelligent creation and distribution of highly-tailored content straight to every internet consumer.

Web 3.0 will be able to interact directly with users, devices, and systems in smart homes, smart vehicles and workplaces. The content creation process will also be assisted by machines, which will likely lead to more quality content being distributed. Web 3.0 internet users will evolve from products to owners — as technologies like non-fungible tokens (NFTs) will enable content creators to truly own their digital content.

Web 3 will be decentralized – eliminating middle parties everywhere and enabling the ability for trustless, secure P2P transactions across the globe. Such capabilities will be beneficial for the increasingly growing Creator Economy, as participants around the world will be able to securely transact across the web without the need of an intermediary third party.

Web 3.0 and why it matters

The philosophy behind Web 3.0 is that websites will be able to interpret user data and continuously become smarter — offering an improved digital experience.

There are some early implementations that you might have experienced if you recently shopped on Amazon. For instance, when you're shopping for a laptop, the e-commerce platform will automatically recommend a set of related items based on what shoppers with similar profiles have also bought. Amazon is already using the customer's digital footprint to evolve and make more relevant recommendations.

Unfortunately, this current learning mechanism makes internet users a

commodity, with the browsing data being the product. Since most people didn't realize the value of their data, they gave it away willingly to internet giants, making them the owners and sole profiteers. With the advent of the semantic web, this will soon be subject to change.

Web 3.0 users will reclaim the sole ownership of their data, and they'll be compensated for it. Sharing personal information will be optional for each individual.

Internet users are also hoping that the semantic web will be the end of disruptive advertising, which is the current standard of Web 2.0. The user experience would no longer be interrupted by never-ending pop-ups and unskippable ads. Instead, users will regain control of their precious time, choosing if and how many ads they want to see and be compensated accordingly.

Web 3.0 aims to create a fairer online environment, as the next generation of the internet becomes decentralized. But such a large paradigm shift is possible with an array of advanced technologies.

Blockchain and distributed ledger technologies will be the go-to solution for decentralized data storage and self-sovereign identity — as well as the payment infrastructure behind the semantic web. AI will be responsible for interpreting and filtering online data and offering the best choices to users. IoT will assure the semantic web's interoperability layer — connecting the internet to smart devices.

Blockchain is envisioned as one of the core technological layers of Web 3.0, responsible for facilitating trust in a trustless virtual environment. Meaning that users can trust online data as it is filtered by a consensus engine through the future internet's decentralized, blockchain-based publication system.

Ethereum, called by some the "world computer," is emerging as the bedrock of numerous Web 3.0 applications, also known as dApps, short for decentralized applications. Instead of centralized servers, Ethereum hosts these dApps on user-operated nodes on the blockchain — allowing anyone to use them without having their data monetized. There is no central entity that can block one's access to these dApps.

The Ethereum network also offers built-in payments via its native cryptocurrency ETH. In the ethos of the semantic web, payments on Ethereum require no personal data, and there is no central party that can prevent or undo payments.

How Web 3.0 will shape our future

Presently, the concept of the semantic web is criticized as far-fetched and futuristic, yet there are already some applications built on the characteristics of Web 3.0.

Filecoin, the decentralized storage and open-source cryptocurrency network, is a popular project. The protocol ditches central servers, enabling computer owners around the world to rent out their spare disk space, in exchange for FIL — the network's native crypto token.

Another semantic web-oriented project is Odysee, a decentralized, blockchain-based, peer-to-peer video sharing network, built by LBRY — which directly rewards content creators with LBRY Credits.

Ocean Protocol aims to unlock the value of data by building tools for the Web 3.0 data economy. The open-source protocol's Ocean Market App enables data owners to publish using Ocean data tokens, and users to purchase access to the data, while data providers are rewarded with OCEAN tokens.

These early iterations of Web 3.0 native applications are paving the way toward a privacy-preserving, human-centric future web — where machines and users can exchange data and value on peer-to-peer infrastructure.

Web 3.0 will also introduce an array of possibilities, like decentralized autonomous organizations(DAOs),global-scaledecentralized autonomous companies (DACs), self-sovereign identities, and decentralized data marketplaces.

It will also redefine the mechanics of human-machine interactions, by facilitating trustless data transfers, automatized, cryptocurrency-based payments, seamless ownership transfers, and much more.

While Web 2.0 allowed for the sharing of information across borders, this information was often managed by centralized third parties. In the world of Web 3.0, users will be able to interact with each other without interference from these middlemen, enabling information to be shared freely whilst reducing the risk of censorship.

The dawn of Web 3.0 will mark the first time in history when biological and artificial intelligence will be globally interconnected and interoperable. It has given rise to the most significant technological revolution ever known to mankind. The Internet has broken down geographical barriers, made information more accessible, and connected humans in ways that were previously unimaginable. For the past decade, companies — old and new have been laying the foundations for the next generation of the Internet. From blockchain to artificial intelligence, humanity is about to enter the next stage in the evolution of the World Wide Web.

Web 3, the Blockchain, and the Decentralized Web

Investors and builders who embrace the possibilities that this next-generation Internet can offer will find themselves in an advantageous position once the world begins to adopt all of the advantages which Web 3.0 has to offer.

Behind cryptocurrencies (e.g. Bitcoin, Ether), are fully decentralized networks that are governed by their respective, underlying protocols. As adoption of these blockchains grows, via greater network usage, rise in decentralized apps (dApps), growth in decentralized finance (DeFi), and acceptance of Non-Fungible Tokens (NFTs), so too will the adoption of Web 3.0 and its technologies.

Open-source software is already changing the way the internet works for the better, with community-owned and developed browsers like Mozilla Firefox being used around the world. Operation systems like Linux have been widespread across the tech sphere, including powering the Android platform. WordPress was responsible for the birth of self-publications, new journalism, and platforms that are now integral to keep the world informed. Open-source software, alongside its developer community and broad user bases, emphasize the importance of ensuring the internet is open and accessible to all.

When the Covid-19 pandemic began spreading around the world, many countries were forced to shut down their own apps when it was discovered that both personal and health information of millions of people were leaked/ collected from such apps.

Countries have been adapting open-source protocols, decentralized data aggregation and state of the art encryption mechanisms to ensure that messages are not readable for outside viewers: an application that allows anyone to read the documentation and discover how to contribute on a designated community page.

With the current situation forcing technologists to be stuck at home, engagement with open-source projects increased, with Github noting open-source project creation has risen 25% since April 2020 year over year. Additionally, digital assets such as Bitcoin and Ethereum are growing in popularity worldwide, demonstrating further interest in how open-source decentralized technology can impact things like currency and financial transactions.

Other than the signs of introducing machine learning and connecting machines through IoT, the third generation of the internet would run on decentralized protocols. Blockchain offers a unique collection of data or a universal state layer, which is subject to collective management. The unique state layer provides the opportunity for developing a value settlement layer on the internet. The state layer helps in sending files in a copy-protected manner to enable effective P2P transactions without any intermediaries.

As Web 3.0 networks will operate through decentralized protocols — the founding blocks of blockchain and cryptocurrency technology — we can expect to see a strong convergence and symbiotic relationship between these three technologies and other fields. They will be interoperable, seamlessly integrated, automated through smart contracts and used to power anything from micro transactions, censorship-resistant P2P data file storage and sharing with applications like Filecoin, to completely changing every company conduct and operate their business.

Like any new intervention, there are bound to be creases that will need to be ironed out as the technology develops. Blockchain has come a long way since its early inception when there was only Bitcoin. Back then, many people doubted that blockchain would be what it is or where it is today. Any piece of revolutionary technology, from the first car to the first iPhone, has gone through several iterations, improving leaps and bounds with each new development.

The Web 3.0 vision is quickly progressing. However, it will take time for the masses to build and adopt a decentralized platform. The technology needs time to mature and the ecosystem will need to welcome all creators.

The decentralized computing power and storage platforms allow users' access to a censorship-resistant, reliable, and unstoppable internet built for the masses.

The Web 3.0 — with all the components of its stack, from networking, computing, storage to end-user applications — is being developed. This new era that embraces freedom, flexibility, accessibility and reliability

involves a massive change — a paradigm shift — that will allow users to adopt decentralized and censorship-resistant solutions in order to become self-sovereign. Within the next generation of platforms, computing providers are striving to build open and fairer systems to prepare for this paradigm shift.

The new internet will provide a more personal and customized browsing experience, a smarter and more human-like search assistant, and other decentralized benefits that are hoped will help to establish a more equitable web. This will be achieved by empowering each individual user to become a sovereign over their data, and creating a richer overall experience.

When Web 3.0 inevitably arrives — as hard as it is to fathom considering how smart devices have already changed our behavioral patterns — the internet will become exponentially more integrated in our daily lives.

We will see nearly all of today's normally offline machines, from home appliances like ovens, vacuums, and refrigerators to all types of transport become part of the IoT economy, interacting with its autonomous servers and decentralized applications (DApps), advancing new digital realms like blockchain and digital asset to power a myriad of new tech for the 21st century.

Improved technology, user experience and education of users is pertinent to the preparation for the next paradigm shift. Web 3.0 will bring us a fairer internet with uninterrupted services, reduced data breaches and more freedom and capability to run applications anywhere in the world on a decentralized platform. It's only a matter of time before end users realize the better infrastructure needed to support the digitization of the world — and this next chapter in our human history. That's the future we should all look forward to.