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Web 3.0: The Boon or Bane for the Society?

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Abstract: In this current networked world, Web has become the foremost effective and advanced way of communication. During the initial evolution of the web there was no presumption that the web development is going to be a big deal in the future. In such a short period, Web 2.0 and the Web 3.0 has built an excellent impression within the face of Internet world. The gap from Web 1.0 to Web 2.0 has been covered almost in an exceeding decade. But soon after Web2.0 a replacement, Web3.0 has evolved which has not only raised the extent of interest but also many questions among developers, users and the regulators. Do we actually need Web3.0 at this stage, what are the forcing factors, how it's different from Web2.0 and Semantic Web, what are its social, moral and security implications, is it only about personalization, of these questions have made Web3.0 popular among its stakeholders. During this paper the first focus are on the link between Web 2.0, Web 3.0 and therefore the Semantic Web while the secondary is on the rising security concerns about rapid and sequential Web developments. However, the changing business models within the future Web 3.0 also will be highlighted. Semantic Web technologies are considered as a bridge for the technological evolution from Web 2.0 to Web 3.0. Efforts are made to explain the distinctions bet–ween this and therefore the future Web.

Keywords: Web 3.0, Semantic Web, New Internet, Decentralized Internet, Privacy.

I. INTRODUCTION

The Web3.0 is the third-generation internet environment. The Web3.0 is a Decentralized internet where the users can have direct one to one interaction or transaction without any middleman involved, which leads to more private and personalized internet. Web3.0 uses the technologies like Blockchain, Artificial Intelligence (AI), Cryptocurrency, Machine Learning (ML) etc. Unlike Web2.0, Web3.0 makes the users the sole owner of their content over the internet. In short, there is no higher authority to decide what and who should be on the internet. Everything is decided by the code i.e., technologies like Machine learning and Artificial Intelligence.

Back in the days when we used to write a letter to our loved ones, and we post it in the post office. Now, there is a slightest possibility that the postman would open and read the letter, we never know. So, it's the same with Web2.0, or we can say it's worse than that, The IT companies tracks every single keyword we search, every post we like, every transaction or interactions we have, they know about all likes and dislikes. And they use these data to show more personalized advertisement for the users. Hence, the phrase "Privacy is a myth" is not really a myth. So, to overcome this issue, the Web3.0 is introduced in the field of internet by the developers who are more concerned about the privacy of people over the internet.

II. WEB 1.0

Web1.0 was first stage of world wide web. It was developed by Tim Berners-Lee in the year 1989. Between the years of 1989 and 2004 the internet was mostly read only static pages where user could only read what is written over the website. Web 1.0 is also known as The Static Web, which comprises of three fundamental technology HTML (Hyper Text Markup Language), URL (Unique Resource Locator), HTTP (Hyper Text Transfer Protocol). HTML is a formatting language of the web, URL is the unique web address, used to locate web pages, HTTP allows the retrieval of information across the web. As it was static web it was not user friendly at all and had no algorithms that would dynamically serve the pages. On Web 1.0 the functions like email and real time retrieval of News served the most for the users of the internet back then. Web 1.0 was a one-way information highway, the content on these web pages were developed by the companies hosting website itself, and the users could not interact with these web pages.

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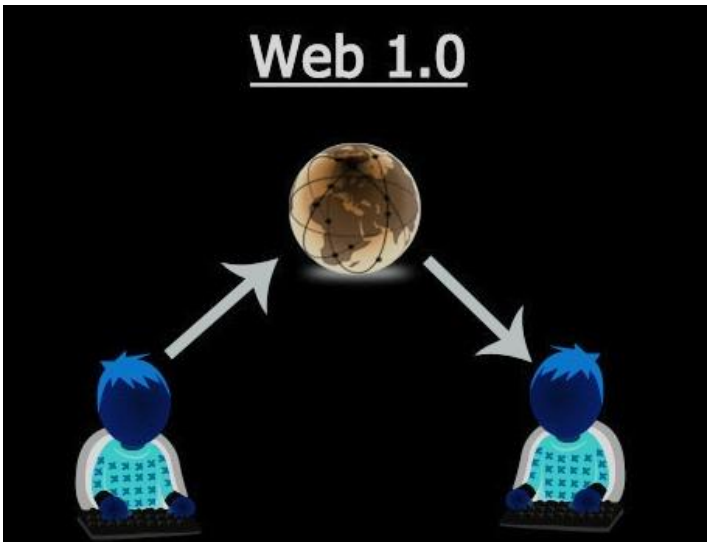

Fig. 1. Web1.0 Architecture

III. WEB 2.0

From around 2004 until now the internet has evolved exponentially. In the year 2005 came the concept of Web 2.0. During this period, we saw a drastic shift on how we used websites through advancements in web technologies like HTML5, CSS (Cascading Style Sheet) and JavaScript interactive and rich website started to proliferate. These interactive platforms allowed the users to generate their own content and be a much larger part of these websites. If web 1.0 was read-only web, then web 2.0 is kind of read and write platform, where the users on these platforms were fundamental as well.

The Web 2.0 is often also called as the Social Web and was driven by innovations in technologies such as mobile phone application companies that enabled to flourish in web2.0 environments like the Facebook, Instagram, Twitter, Google, YouTube etc. These companies been able to generate trillions of dollars of value for their shareholders by effectively leveraging the user data from billions of users around the world. They transformed the way we live our lives from the way we order our foods to from the way we book our rides, from the way interact with each other, to the way we make financial transactions. But the worrisome part of Web 2.0 is that it is owned by these giant companies, they control the platform, and they are gate keepers of these information. The Web 2.0 is inherently centralized with these companies creating walled gardens of value that we can't participate in. In short, these companies are the real owner of your personal data and also the owner of the content you make online. These companies can misuse the data of the users without the knowledge of the user itself. The Facebooks Cambridge Analytica Data Scandal is the prime example of how these giant companies collect the personal information's of their users and use it manipulate them in the way they want to.

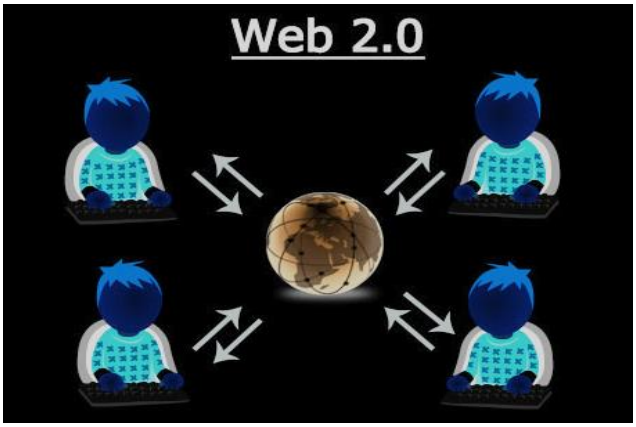

Fig. 2. Web 2.0 Architecture

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IV. WEB 3.0

The Web 3.0 is the next generation of the internet. Which people envision will be more decentralized and permissionless one that's build on decentralized protocol where users don't only help with content creations but also in the governance of the web itself. They also have the ability to own part of the network, hence we can say Web 3.0 as the Read, Write and Own internet. The Web 3.0 is also called as the Semantic Web or Decentralized internet. There are already thousands of technologies that could serve as the backbone of the web 3.0 world, some of them are Artificial Intelligence (AI), Machine Learning (ML), Cryptography, Cryptocurrency, Big Data, Decentralized Ledger Technology (DLT), NFT (Non-Fungible Tokes), VR, AR, Metaverse, Block-Chain technologies etc. The Web 3.0 or Semantic Web was initially conceptualized by Tim Berners-Lee in 2001. But today the concept of Web 3.0 has drastically evolved beyond the initial concepts of Tim Berners-Lee.

In Web 3.0 the financial transactions will not be made on conventional or digital many but on cryptocurrencies like Bitcoin, Ethereum, Solana, Binance Coin, Decentarland, BAT (Basic Attention Token) etc. Because the bank transfer can be easily trackable whereas the transaction on the cryptocurrencies is almost impossible to track down, which ensures more safe, private, and fast transaction. Unlike Web 2.0 in Web 3.0 data's will be interconnected in decentralized way, i.e., there won't be any middleman to moderate our uses and transactions. In Web 3.0 there is no higher authority to decide who and what should be on the platform. The entire platform is managed by the codes, only codes can decide whether the content or person violate the rules of the platform.

Some commonly used terminologies in Web 3.0:

- Artificial Intelligence
- Decentralization
- Cryptocurrency
- Blockchain

Artificial Intelligence

AI (Artificial Intelligence) is the ability of a computer or computer-controlled robot to perform activities commonly associated with intelligent beings. The term Artificial Intelligence is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, just as the ability to reason, identify meaning, generalize, or study from experience. The computers can be programmed to perform out various complex activities such as, discovering proofs for mathematical theorems or playing chess with. Still, despite continuing advances in computer processing speed and memory capacity, there exists no programs that can match human ability over wider domains or in tasks needing much everyday knowledge.

Decentralization

Decentralization means there is no central authority to monitor or dictate the platform. Hence there would be no discrimination the code or algorithm treats each and every person as equal. So only the algorithm will decide whether the content violate certain policy or not, which increases freedom of speech on the online platforms.

Cryptocurrency

Cryptocurrency is a digital unit of currencies; it is designed such that it could be exchanged through computer networks. The cryptocurrency is not reliable on any authority such as government, banks etc. Cryptocurrency uses blockchain technology to organize and monitor the transactions. Some popular cryptocurrencies are Bitcoin, Ethereum, BAT(Basic Attention Token), Decentraland, Solana etc.

Blockchain

A blockchain is a distributed database that is shared between the nodes of a computer network. As a database, a blockchain stores information virtually in digital format. Blockchains are well known for their huge role in cryptocurrency systems, such as Ethereum and Bitcoin, for maintaining a secure and decentralized record of transactions. The Blockchain guarantees the accuracy and security of a record of data and generates trust without the need of any trusted third party.

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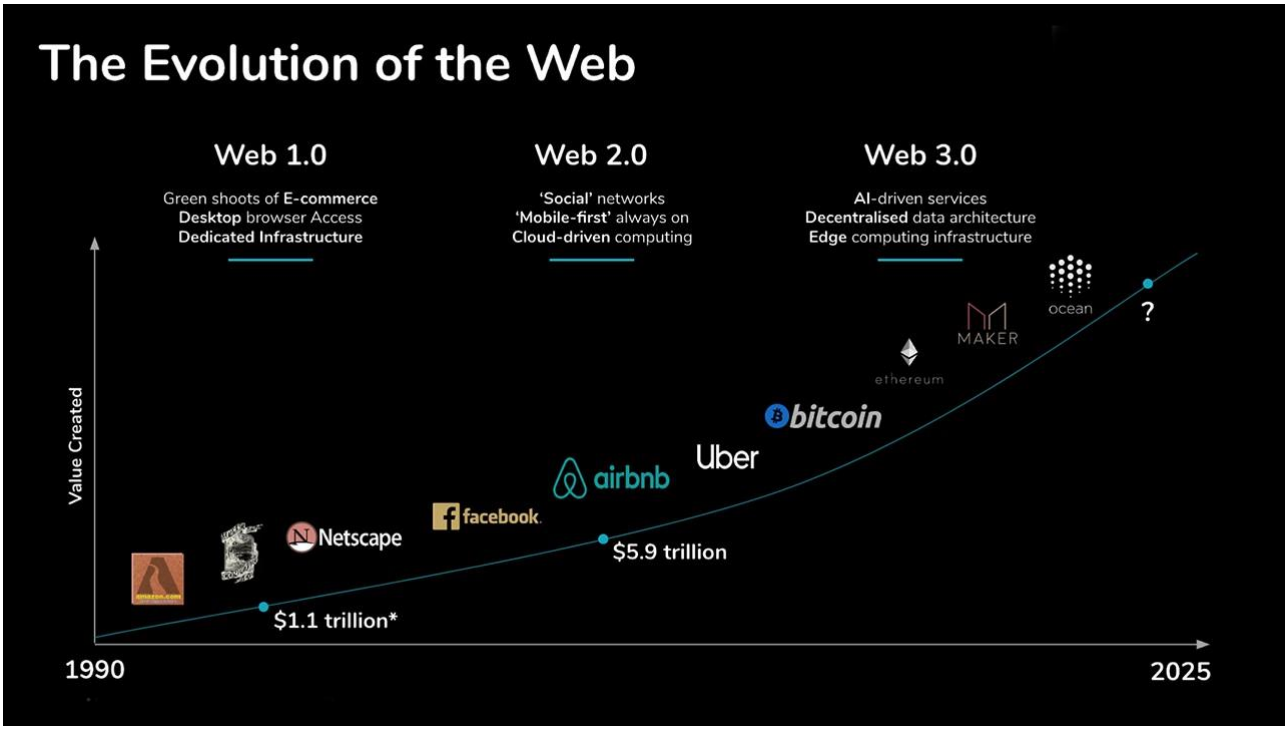

Fig. 3. Evolution of Internet.

V. ADVANTAGES O F WEB 3.0

The most promising thing about web 3.0 is that it provides decentralized alternative where we are all users, owners, and developers. Web 3.0 enables the future where distributed users and machines will be able to interact with data, information, and other counterparties via a substrate of peer-to-peer networks without the need of middleman. The backend infrastructure of Web 3.0 is inherently decentralized across nodes. Nodes that have the singular purpose of maintaining the network. If one of the nodes goes down the network still runs. If one of these nodes gets hacked, it doesn't affect the state or security of the broader network. A distributed network like blockchain is cryptographically secured. There is no way someone else can secretly alter the code of the smart contract unless they have the keys. Any update to the smart contract is timestamped and immutably stored on the blockchain forever. The cryptographically secured nature of a decentralized blockchain means that you don't have to trust with anyone with your data you don't have to trust that they keep the server safe, and the apps don't have the malicious component. The source code is fully open sourced and auditable for everyone to see. Another important feature of Web 3.0 or decentralized network is that they are permissionless, all you need is to connect a web 3 wallet and no KYC required. Nobody can pull your content down because they don't agree to whatever we said. The quote "Justice is blind" might be questionable but the quote "Code is blind" is an absolute fact. In Web 3.0 any one can directly access the source code of the application or software without any third part API (Application Programming Interface).

VI. CRITICISMS ON WEB 3.0

The Decentralized internet or Web 3.0 is a double-edged sword, it definitely has many advantages but the damages from Web 3.0 are also inevitable. Most important challenge is scalability, more specifically because it is built on decentralized network it is nowhere near fast in serving data and running computation as it is on centralized server. On a network like Ethereum miners will first have to propagate a block in order to update the state of the ledger. To talk about an idealistic internet where everyone owns a piece but if a user has to wait for a long time to get that information, then there is no point in bragging about decentralization, why one use a decentralized social media platform that runs on a snail's speed when one can just open up Instagram and have the dopamine hit within no time. The most challenging aspect of success of web 3.0 is that the user experience is not as simple as web 2.0 i.e.., to use Web 3.0 the users must have the knowledge of how to set up an Ethereum wallet, how to interact with web 3.0 wallet, approve transactions and store passwords and private keys. This off course opens up risks when it comes to potential losses or other human errors there also the cost component in order to use web 3.0 application you have to pay a fee in order to compute smart contracts. This is just gas fee when it comes to Ethereum for say. While this fee is lower on other layer one networks and side chains, but its still a fee that the users will have to pay. And that makes majority of the users to say goodbye to the Web 3.0. The updates in

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Web 3.0 application are approved much slower as compared to the centralized servers. Now, the open-source nature of web 3 application is great for transparency. But it's a double-edged sword. The open-source code is not only studied by the White hat hackers and programmers but also the Black-hat hacker are waiting desperately for any vulnerability on any application just to exploit it. And because the Web 3.0 is decentralized and its harder if not impossible to track a user, this gives the cyber bullies a free license to bully and harass anyone on the internet and it becomes harder to identify the identity of the person behind it. This creates an unhealthy and toxic environment on internet. And the most worrisome argument about the decentralized internet is that, as it is fully secured and unable to track, the terrorist organizations and criminals can easily communicate through these servers without any worry. That is the one of the main reason most of the government does not support the idea of Decentralized internet.

CONCLUSION

We often here the quote "Every coin has two sides", it is also true with Web 3.0 or Decentralized internet. As is mentioned int before the Decentralized internet is a double-edged sword which has benefits of sure but also has huge price to pay. There is no debate that the web 3.0 will take a huge boom in near future. But we have to be prepared for the potential risk which will be followed. In my opinion it is too early to fully turn towards Decentralized internet, as the technology is new, and the damages are unpredictable. So, we should first take the baby steps towards the Web 3.0, and counter all possible challenges before completely adopting Decentralized internet. And one thing to say for sure is that complete Decentralized internet is next to impossible to happen. There are already few projects which works on Decentralized servers like Brave browser, Ethereum, Decentraland etc, which we can use and have the experience of how Web 3.0 feels like. But most importantly the Web 3.0 technologies can only be understood by technology geeks, and it's a backbreaking task to make the normal users understand these technologies.

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