

Web3 Aggregators: Bridging the Gap to Decentralized Data

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Abstract - Web3, which promises a decentralized, user-centric digital ecosystem, has arisen as a revolutionary notion in the quickly changing internet world. Web3 aggregators, a new class of services, are at the center of this transformation and are essential in helping consumers connect to the decentralized web. Web3 aggregators are distinct from standard web aggregators in that they utilize decentralized protocols, smart contracts, and blockchain technology to collect and display data from several decentralized sources. This article highlights the transformational potential of Web3 aggregators through a thorough analysis of real-world applications, including their impact on industries like finance, gaming, and decentralized financing (DeFi). This potential is not without obstacles, though. Web3 aggregators address several major challenges, including scalability, interoperability, and data accuracy. The Web3 Aggregator project seeks to provide a comprehensive platform that combines decentralized information and services delivery with the capability of Web3 technology. A single point of entry to these services is becoming more and more necessary in an era where blockchain networks, decentralized apps (dApps), and smart contracts are growing at a rapid pace. With the goal of bridging the gap between consumers and the decentralized web, Web3 Aggregator offers an intuitive interface for managing, accessing, and interacting with a range of Web3 services, applications, and data sources. This project aspires to facilitate the adoption and integration of Web3 technologies into daily activities while enabling consumers and enterprises to fully realize the promise of these technologies through the creation of Web3 Aggregator.

Key Words: Web3, Web3 aggregator, decentralization, blockchain, smart contracts, data aggregation, decentralized finance (DeFi), digital ecosystem.

1. INTRODUCTION

A new era of decentralization has begun with the rise of Web3 technologies, in which trust is ingrained in the internet's design rather than being bestowed upon its centralized administrators. A plethora of decentralized applications (dApps), blockchain networks, and smart contracts have emerged as a result of this paradigm change, all of which contribute to a worldwide ecosystem

that allows people and businesses to connect securely, peer-to-peer, and without the need for middlemen. The demand for an easily navigable entry point to this decentralized world has grown as the Web3 ecosystem keeps growing. Our attempt to create a solution that closes the gap between the quickly developing Web3 world and regular users is embodied in the "Web3 Aggregator" project. A Web3 Aggregator is a technology that merges decentralized exchanges (DEXs) and NFT marketplaces into an all-encompassing ecosystem. As such, users can trade, purchase, and sell NFTs across numerous sites without having to register for multiple accounts.

2. ARCHITECTURE OF Web3 AGGREGATOR

A Web3 aggregator's architecture is distinguished by its decentralized design and use of multiple components to accomplish its capabilities. Typically, a Web3 aggregator consists of the following essential elements:

2.1. Sources of Data

Web3 aggregators collect information from off-chain data sources, decentralized apps (dApps), and blockchain networks, among other decentralized sources. The raw data used by the aggregator to compile and display the information to users comes from these data sources.

2.2 Blockchain Interfaces

To communicate with blockchain networks and obtain pertinent data, blockchain interfaces are utilized. Through these interfaces, the aggregator can retrieve data, which is processed and shown to users, including balances for tokens, smart contract data, and transaction data.

2.3 Layer for Data Processing and Aggregation

This layer handles the processing and combining of data from various sources. It has protocols and techniques that guarantee the dependability and correctness of the combined data. Additionally, data standardization and validation are handled by this layer to assure consistency across various data sources.

2.4 Data Storage

To store aggregated data, Web3 aggregators may make use of decentralized storage systems like IPFS (InterPlanetary File System). Data availability and integrity are guaranteed by decentralized storage, along with defense against censorship and data manipulation.

2.5. User Interface

The Web3 aggregator's frontend part that communicates with users is called the user interface. Users can access and engage with the combined data and services via its graphical user interface. A seamless user experience is ensured by the user interface's user-friendly and intuitive design.

2.6 Decentralized Identity

User identities and access restrictions within the Web3 aggregator may be managed using decentralized identity solutions, such as decentralized identifiers (DIDs) and verified credentials. These solutions protect user security and privacy when they communicate with the aggregator.

2.7 Smart Contracts

Smart contracts are dynamically performing agreements that are encoded into computer code. Smart contracts are used in the framework of Web3 aggregators to automate a number of tasks, including transaction execution, validation, and data gathering.

In a nutshell a Web3 aggregator's architecture is distinguished by its decentralized design and the utilization of several components for the collection, processing, and presentation of data from decentralized sources. By utilizing this design, Web3 aggregators may provide consumers with a cohesive and smooth experience, surpassing the constraints of conventional online aggregation techniques.

3. METHODOLOGY

A user interface that lets you engage with the platform is shown to you when you visit a Web3 aggregator website. The first step is to decide the assets you want to buy or sell. These assets could be tokens, coins, NFTs (non-fungible tokens), or other kinds of decentralized assets (VDAs). The aggregator then queries its data sources to retrieve the most recent prices of the chosen assets across various platforms, which could include decentralized exchanges (DEXs) and other marketplaces. You may make an informed choice by viewing a comparison of costs across these platforms, which is displayed by the aggregator based on the data that was received. After that, you can decide which market to buy the assets you're interested in at a lower price. Following your decision, the aggregator creates a transaction that includes the specifics

of the trade, such as the assets to be traded, the quantity, and the marketplace of choice. After that, the blockchain receives this transaction to be processed. The transaction is validated by the blockchain network to make sure it satisfies the necessary requirements and that the assets are exchangeable. The transaction is entered into the blockchain's ledger and added to a block once it has been verified. Consensus is the procedure that guarantees the transaction's security and irreversibility. The assets are traded on the chosen marketplace when the transaction has been completed. The ownership of the assets is updated when a transaction is recorded on the blockchain. Upon that, the aggregator's interface allows you to see your assets' updated status, indicating that the deal was successfully completed. In a nutshell a Web3 aggregator offers an easy-to-use interface for communicating with marketplaces and decentralized assets. It lets customers choose the best alternative by comparing prices on several platforms and executing trades on the blockchain with ease.

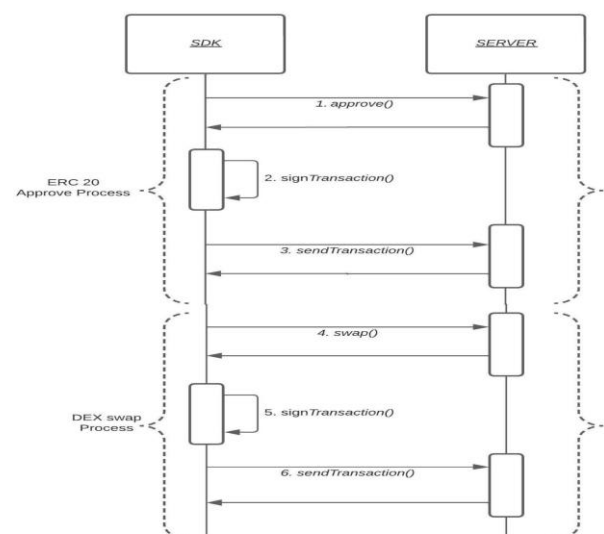


Fig -1: Methodology

4. USE CASES AND APPLICATIONS

Because of its capacity to compile and organize data from decentralized sources, Web3 aggregators are used in a broad variety of sectors and fields. Web3 aggregators have several important applications and use cases, such as:

4.1 Decentralized Finance (DeFi)

By pooling liquidity from several Decentralized Exchanges (DEXs) and other DeFi protocols, Web3 aggregators are essential to the DeFi ecosystem. They give consumers the

ability to compare loan terms, interest rates, and other financial goods between several platforms, enabling them to make well-informed financial decisions.

4.2 Token Swapping and Trading

By integrating prices from several DEXs, Web3 aggregators make token swapping and trading easier. Without the need for a centralized exchange, they allow consumers to locate the best rates for their deals and execute them smoothly on the blockchain.

4.3 NFT Marketplaces

Web3 aggregators can compile NFT listings from many marketplaces, enabling consumers to find and buy NFTs across multiple platforms. The non-fungible token (NFT) market is expanding. By doing this, NFTs become more visible and authors are able to reach a larger audience.

4.4 Data Aggregation and Analysis

Web3 aggregators are capable of gathering and examining data from off-chain sources as well as other blockchain networks. Users and companies can gain important insights from this data by using it for trend analysis, market research, and other uses.

4.5 Decentralized Applications (dApps)

Users may find and access decentralized applications from a single, central location thanks to Web3 aggregators, which can gather dApps from multiple sources. This promotes the uptake of dApps by improving their discoverability.

4.6 Identity and Access Management

Users can manage their online identities and access controls across many platforms by using Web3 aggregators to offer decentralized authentication and authorization solutions. When using decentralized services, this improves confidentiality and safety.

These are but a handful of the many uses and applications for Web3 aggregators. We can anticipate seeing even more cutting-edge features and apps created on these platforms as the Web3 ecosystem develops more.

5. CHALLENGES AND FUTURE DIRECTIONS

The ability to manage a high volume of data and transactions from decentralized sources is essential for Web3 aggregators. Keeping decentralization while ensuring scalability is a major issue that must be resolved. Web3 aggregators must be able to communicate with different blockchain networks and protocols in a seamless manner. For many systems and protocols to be effective, interoperability is essential. Web3 aggregators depend on

decentralized sources of data, which might not always be reliable or recent. Keeping data accurate and dependable is a major issue that requires attention. Web3 aggregators must abide by legal standards, particularly when it comes to data protection and money. The difficulty of sustaining decentralization while ensuring regulatory compliance must be faced. The safety of user information and transactions must be guaranteed by Web3 aggregators. Both authentication and encryption are two strong security methods that must be used in order to secure user assets and data.

By bringing layer 2 scaling techniques like state channels and sidechains into practice, Web3 aggregators can become more scalable while experiencing lower latency and transaction costs. Improving cross-chain compatibility will let various blockchain networks communicate better, giving Web3 aggregators access to more decentralized sources. Oracles and data feeds are examples of data verification techniques that can be used to verify the integrity and dependability of data coming from decentralized sources. Web3 aggregators can adhere to regulatory standards by developing security solutions, such as identity verification and data protection measures. Web3 aggregator safety and user asset protection can be achieved through frequent security assessments.

6. RESULTS AND ANALYSIS

By combining data from multiple sources, Web3 aggregators provide users with a cohesive experience by utilizing decentralized technology. They make decentralized information and services more accessible, stimulate innovation, and give people more authority. Nevertheless, before they are widely used, issues like scalability and data accuracy must be resolved.

7. DISCUSSION

Web3 aggregators can spur innovation and empower people, thereby revolutionizing the decentralized online. It is imperative to tackle issues such as data accuracy and scalability in order to fully fulfill this potential. In order to guarantee the security and dependability of Web3 aggregators and to improve user experience, future directions include enhancing cross-chain interoperability and developing scaling solutions.

8. CONCLUSION

To sum all this up, Web3 aggregators are an important breakthrough in the field of decentralized technology that have the potential to completely change how users engage with dApps and services. By acting as links between users and the decentralized web, these aggregators provide a cohesive and smooth experience that cuts through the complexity of decentralized networks. Web3 aggregators enable users to securely and transparently access,

evaluate, and interact with decentralized content and services by utilizing decentralized technologies like blockchain and smart contracts. The capacity of Web3 aggregators to empower consumers is one of its main advantages. These aggregators democratize access to the decentralized web by offering a centralized point for accessing decentralized content and services, allowing users to discover new possibilities. This empowerment, which reduces entry barriers and promotes a more inclusive digital ecosystem, is essential for accelerating the mainstream adoption of decentralized technology. Additionally, Web3 aggregators stimulate innovation by giving programmers fresh chances to create and implement decentralized apps. These platforms allow developers to design novel solutions that cater to the unique demands and issues of consumers inside the decentralized ecosystem by gathering and organizing data from several decentralized sources. The development of the decentralized web and the expansion of decentralized technology depend on this breakthrough. Web3 aggregators offer a doorway to a more user-centric, safe, and inclusive internet, which has the potential to completely transform the decentralized online. Web3 aggregators can pioneer a more decentralized and democratized digital future by tackling obstacles and embracing new paths.

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