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Build and Deploy Decentralized Cryptocurrency Application Using Web 3.0

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ABSTRACT: Web 3.0 cryptocurrencies are decentralized projects that use smart contracts and automate transactions over the internet. They combine blockchain technology with smart contracts to give people control over their data and make transactions without relying on third parties. The web 3.0 application is built and deployed that allows the users to make transactions on blockchain. The amount of Ethereum can be sent from one account to another account where we will be actually interacting with the solidity Ethereum smart contract. The basic design of web 3.0 can help users transfer digital assets, wealth or information efficiently at faster speeds worldwide. Without any centralized authority over the transactions, web 3.0 can offer freedom to internet users to capitalize on the true potential of the web. Here we are proposing a project to provide our customers with fast and secure way to buy, send and receive Ethereum over blockchain using web 3.0 and to provide an anytime anywhere service for the customer.

KEYWORDS: web 3.0, cryptocurrency, blockchain, Ethereum.

I. INTRODUCTION

Web 3.0 is the latest Internet technology that leverages machine learning, artificial intelligence and blockchain to achieve real-world human communication. The Web 3.0 definition can be expanded as follows: data will be interconnected in a decentralized way, which would be a huge leap forward to our current generation of the internet (Web 2.0), where data is mostly stored in centralized repositories. Web 3.0 cryptos are a new wave of cryptocurrencies that focus on making the decentralized vision of Web 3.0 a reality. A blockchain is a type of distributed ledger technology (DLT) that consists of growing list of records, called blocks, that are securely linked together using cryptography. It is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. Blockchain increases trust, security, transparency, and the traceability of data shared across a business network and delivers cost savings with new efficiencies. Transactions in the blockchain are technologically verified and recorded. Cryptocurrency is a digital payment system that doesn't rely on banks to verify transactions. It's a peer-to-peer system that can enable anyone anywhere to send and receive payments. Instead of being physical money carried around and exchanged in the real world, cryptocurrency payments exist purely as digital entries to an online database describing specific transactions. Ethereum is an open source blockchain that is known for its smart contracts functionality, and which serves as the basis for the cryptocurrency ether (ETH). It is most commonly known for its native cryptocurrency, ether (ETH). Ethereum can be used by anyone to create any secured digital technology. Paper is organized as follows. Section II describes the limitations of web 2.0 and proposed solution using decentralized web 3.0 application. The flow diagram represents the step of the design of web application. After designing a user



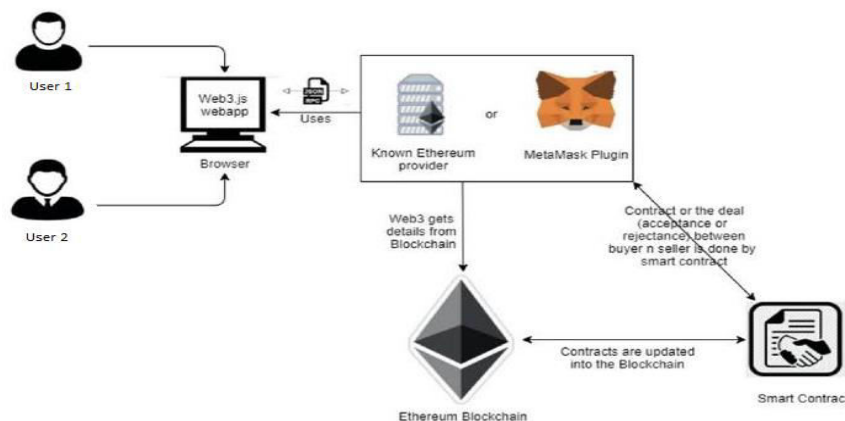
interface for transactions. By the application of Blockchain Technology, the has code will be generated for secured transaction between each user account that is given in Section III. Section IV presents the use case and sequence diagrams for user interacting with the application. Section V presents experimental results showing results of images tested. Finally, Section VI presents the conclusion.

II. RELATED WORK

Presently, in the existing system, Web 2.0, a centralized ecosystem based on a client-server model. In Web 2.0, the backend code that powers apps are deployed onto a server. This system centralizes the power and these conglomerates, collectively termed Big Tech, can block access to anyone or exchange users' crucial data for money. It is a centralized system which uses fiat currency for payments and transactions. Web 2.0 ushered in an era where the web defined itself as a new medium. Application interacts with its frontend, which talks to its backend, which talks to its database. All of this code is hosted on centralized servers and sent to users through an internet browser. This meant that the data of billions of users across the world are centralized and dependant on only a handful of tech companies. In the present work, Web 3.0 is designed to decentralize the application, boosting transparency, facilitating innovation and giving users control over their data and online interactions. Web 3.0 will solve the concerns of Web 2.0, return content rights to authors, provide more secure online tools, decentralise monopolies and thus build a new, more transparent digital economy. In Web 3.0, there is no server or client. Rather, there is peer-to-peer file sharing, done by Interplanetary File System (IPFS). It eliminates the middle man. There's no centralized database that stores the application state, and there's no centralized web server where the backend logic resides. Decentralized application puts greater control in the hands of users, users can decide whether they want to share their data or keep it private.

The work in this paper is divided in two stages. 1) Connected interface for transaction of Ethereum from one account to another. 2) Providing the latest transaction containing the information of address, amount of Ethereum sent, text message and gifs. Market overview of different cryptocurrency prices can also be seen in the web application. Finally, this project provides our customers with fast and secure way to buy, send and receive Ethereum over blockchain using web 3.0 and to provide an anytime anywhere service for the customer.

III. METHODOLOGY



The Frontend Code Communicate with Smart Contract on Ethereum

The frontend is developed using JavaScript(React.js), HTML, CSS where user can interact through the browser, it also communicates with the application logic defined in smart contracts. Every node in the Ethereum network keeps a copy of all states on the Ethereum state machine, including the code and data associated with every smart contract. When we want to interact with the data and code on a blockchain, we need to interact with one of these nodes. This is because any node can broadcast a request for a transaction to be executed on the EVM. The EVM doesn't understand high-level languages like Solidity and Vyper, which are used to write smart contracts. Instead, you have to compile the high-level language down into bytecode, which the EVM can then execute. A miner will then execute the transaction and



propagate the resulting state change to the rest of the network. Moreover, the cost of storing the full Ethereum blockchain goes up as our decentralized app scales, and we need to add more nodes to expand your infrastructure that is why many decentralized apps choose to use services like Infura or Alchemy to manage their node infrastructure for them. They'll help you maintain the infrastructure to ensure reliable uptime and fast response times. Once we connect to the blockchain through a provider, we can read the state stored on the blockchain. But if we want to write to the state, there's still one more thing we need to do before we can submit the transaction to the blockchain— "sign" the transaction using the private key. This "signing" of transactions is where Metamask typically comes in. Metamask is a tool that makes it easy for applications to handle key management and transaction signing. Metamask also provides a connection to the blockchain (as a "provider") since it already has a connection to the nodes provided by Alchemy since it needs it to sign transactions. In this way, Metamask is both a provider and a signer and it acts as a software wallet to store ethereum.

To read data from the smart contracts on the blockchain

A smart contract is a program that runs on the Ethereum blockchain and defines the logic behind the state changes happening on the blockchain. We can use the Web 3.0.js library to query and listen for smart contract events. We can listen to specific events and specify a callback every time the event is fired. For instance, if we have a smart contract that sends a continuous payment stream from person A to person B every block, then you can emit an event every time a new payment is made to person B. Frontend code can listen to events being fired by the smart contract and carry out specific actions based on it. The Graph is an off-chain indexing solution that makes it easier to query data on the Ethereum blockchain.

To build, deploy and test the smart contracts

Hardhat is a developer framework that makes it easier for Ethereum developers to build, deploy, and test their smart contracts. Hardhat offers the "Hardhat Network," which developers can use to deploy their smart contracts onto a local network — without having to deal with live environments. Goerli test network is used to test the smart contracts.

Storage on the Blockchain

IPFS is a distributed file system for storing and accessing data. So, rather than storing data in a centralized database, the IPFS system distributes and stores the data in a peer-to-peer network. This makes it easy for you to retrieve it when you need to. IPFS also has an incentive layer known as "Filecoin." This layer incentivizes nodes around the world to store and retrieve this data. Swarm is similar in that it's a decentralized storage network, but there's one notable difference. While Filecoin is a separate system, Swarm's incentive system is built-in and enforced through smart contracts on the Ethereum blockchain for storing and retrieving data.

IV. FLOW DIAGRAMS

The fig(a) shows the use case diagram of user using the cryptocurrency web application and fig(b) shows the sequence diagram of user using the cryptocurrency web application.

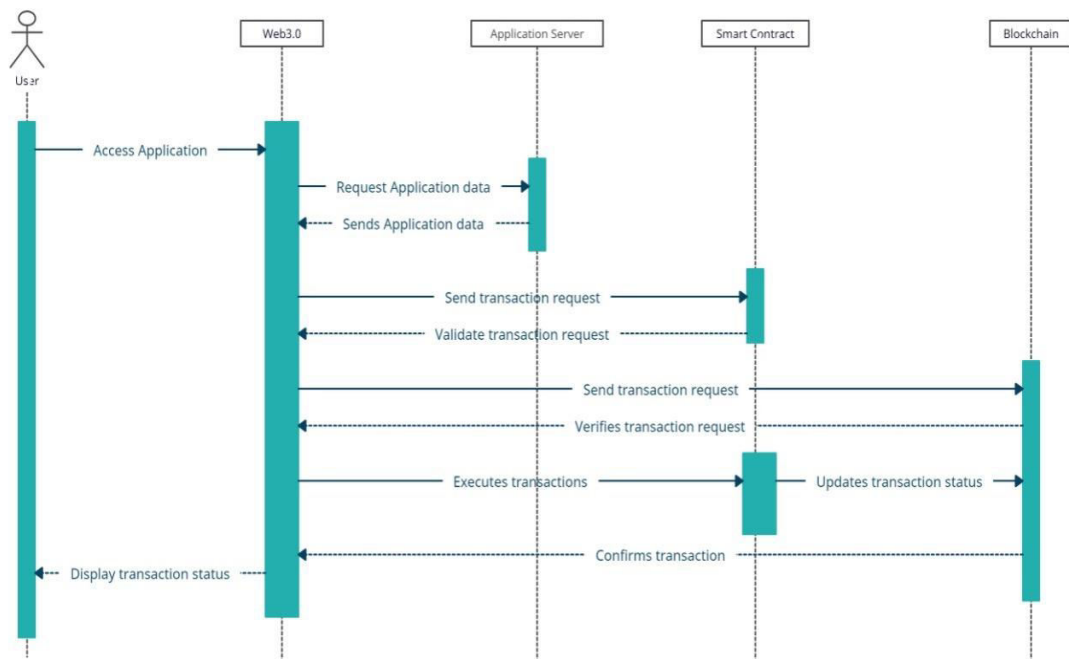


A) Use Case Diagram



Fig(a): Use Case Diagram of user using the cryptocurrency web application

B) Sequence Diagram



Fig(b): Sequence Diagram of user using the cryptocurrency web application



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V. EXPERIMENTAL RESULTS

Figures shows the results of decentralized cryptocurrency web application using web 3.0 Fig(a) shows the home page of the cryptocurrency web application (b) shows the metamask wallet containing the information of user account 1(c)shows the transaction of Ethereum from user account 1(d) shows the latest transaction details including the from and to address, amount of Ethereum sent, message and the gifs (e) shows the details of all the transactions(f) shows the market overview of different cryptos and their prices

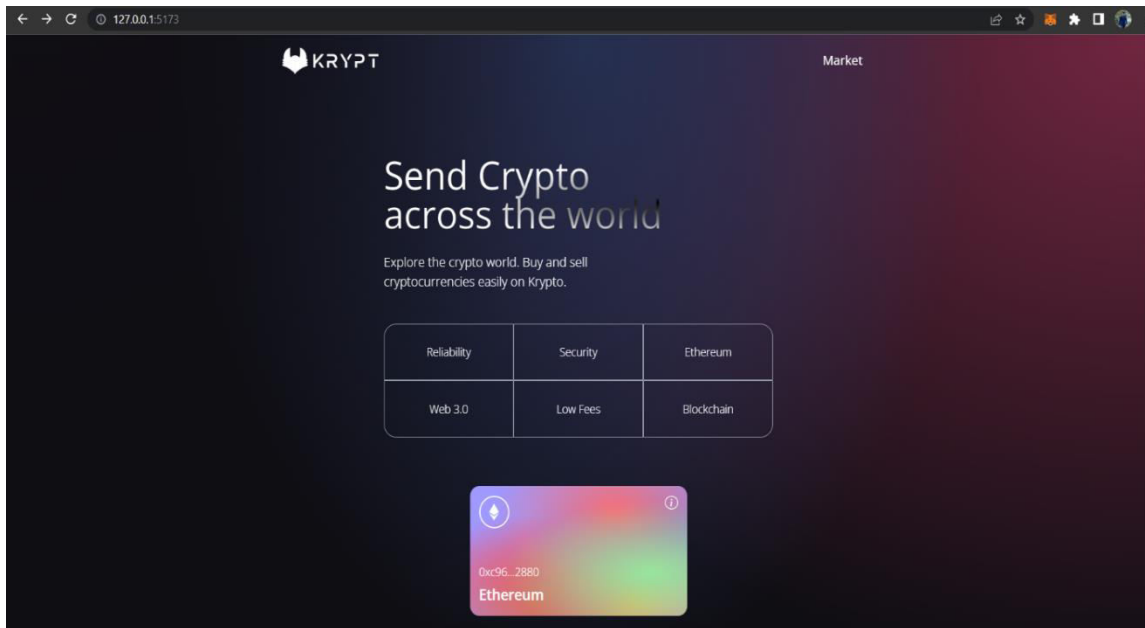


Fig (a) shows the home page of the cryptocurrency web application

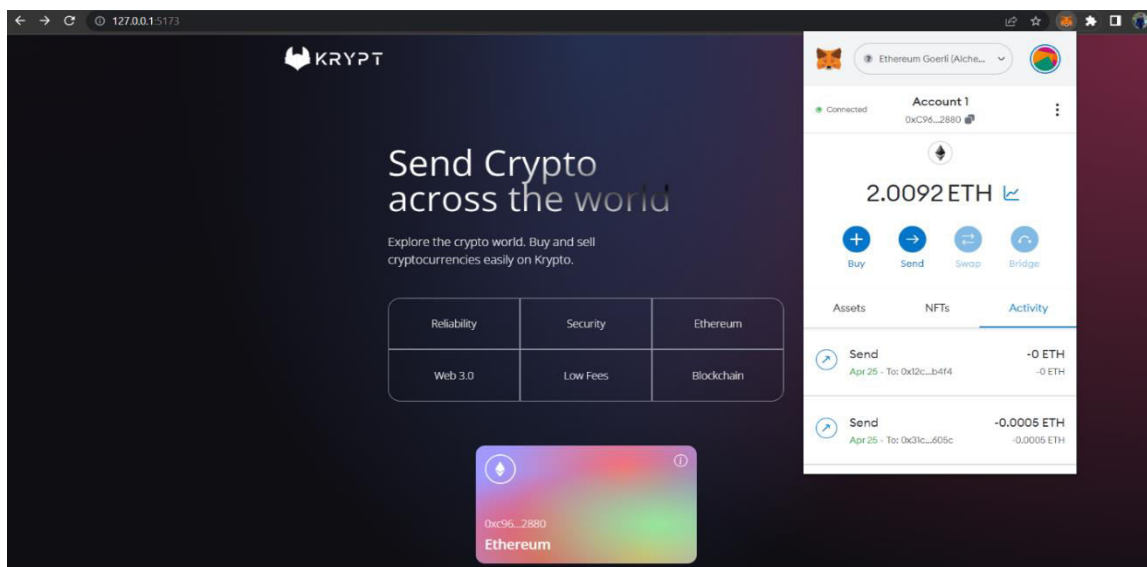


Fig (b) shows the metamask wallet containing the information of user account 1



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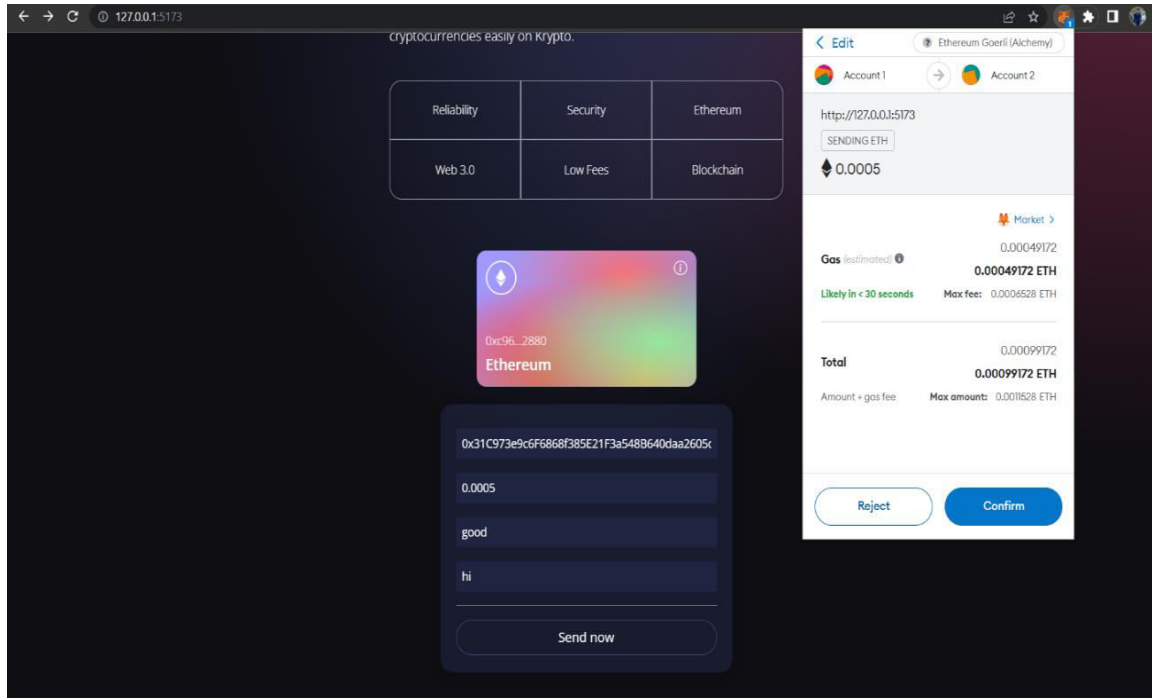


Fig (c) shows the transaction of Ethereum from user account 1

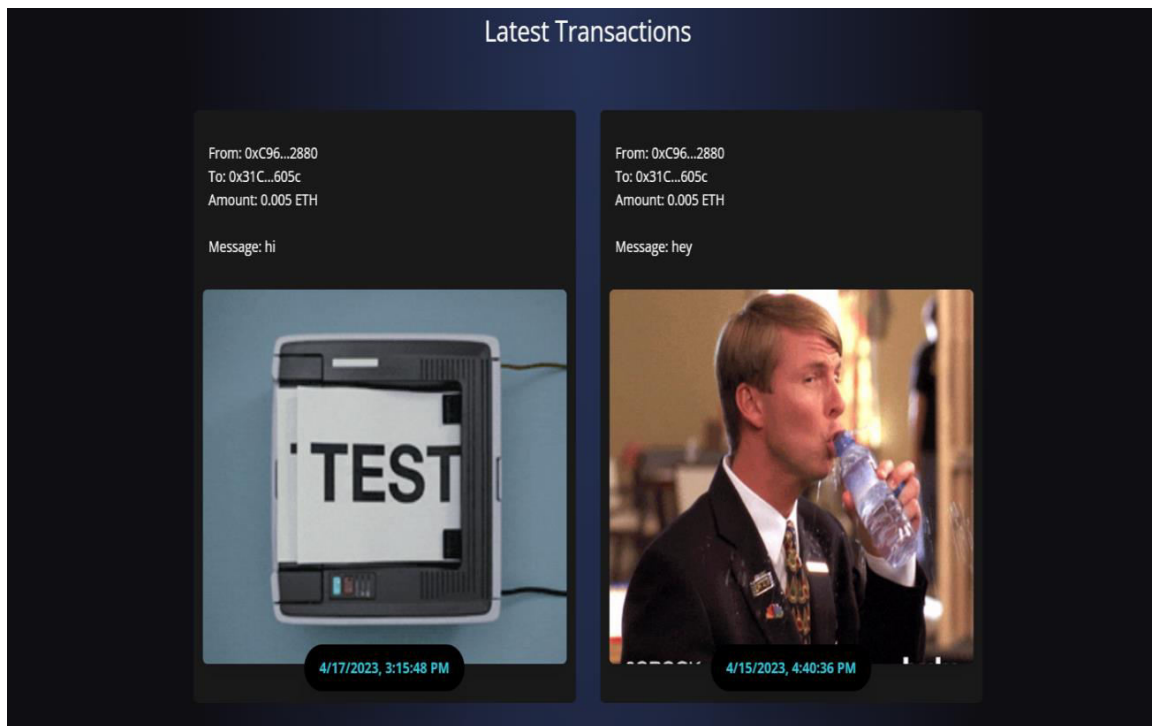


Fig (d) shows the latest transaction details including the from and to address, amount of Ethereum sent, message and the gifs

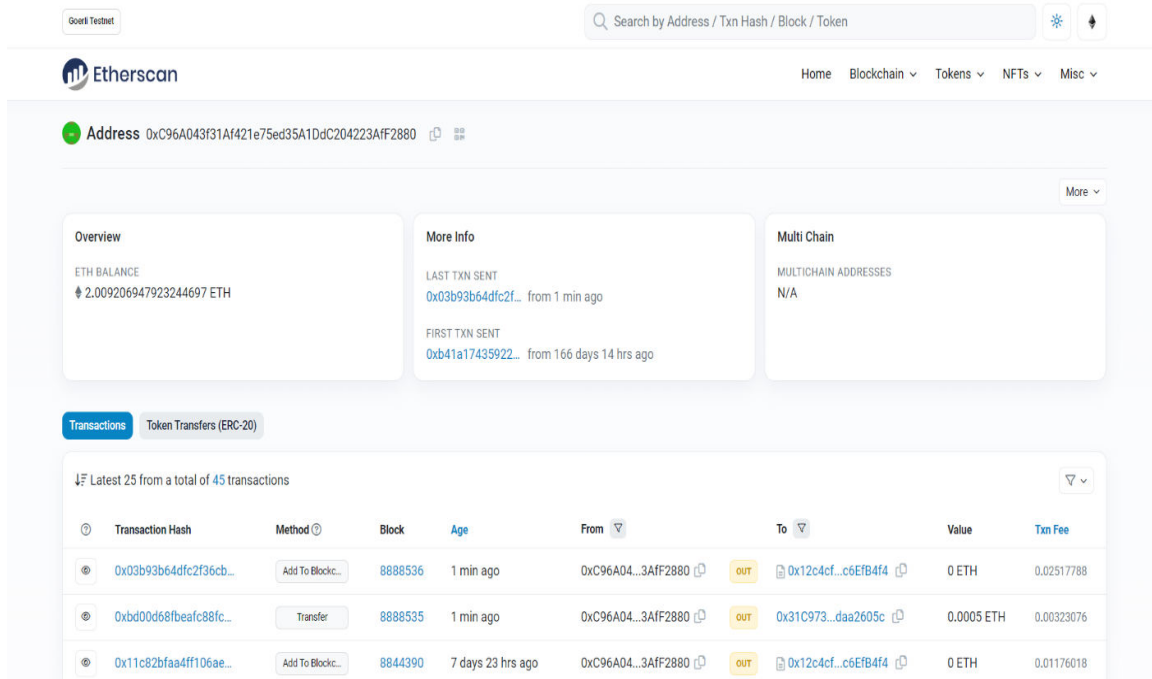


Fig (e) shows the details of all the transactions

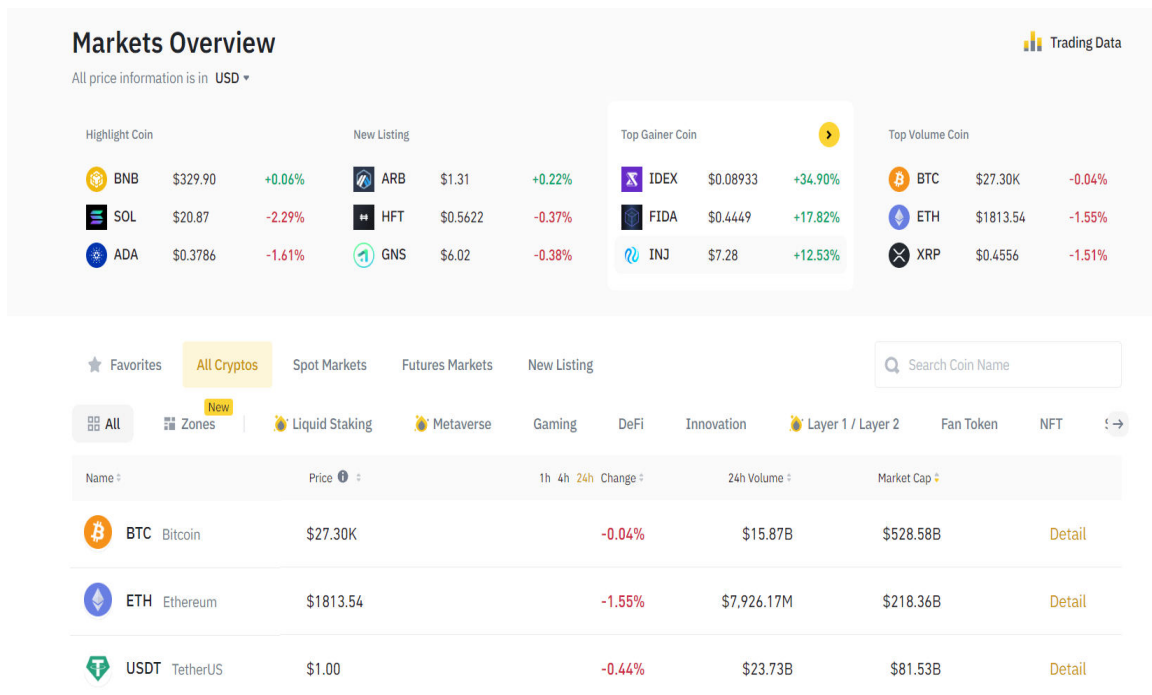


Fig (f) shows the market overview of different cryptos and their prices



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VI. CONCLUSION

In this project we have proposed a decentralized application using Web 3.0 with the smart contract technology that has the potential to expand the working capacities of the industrial realms. From the literature survey findings, we have identified the gaps in the existing systems and accordingly framed the objectives to provide the functionalities for our customers with fast and secure cryptocurrency transactions. We have identified the hardware and software requirements and developed the methodology for the objectives that we have framed. The future for decentralized applications looks promising, so we can soon see them joining the mainstream industry.

REFERENCES

- [1] Aaron W. Baur, J. B. (2016). Cryptocurrencies as a Disruption? Empirical Findings on User Adoption and Future Potential of Bitcoin and Co. Conference on e-Business, e-Services and e-Society, 63-80
- [2] Fry, J. (2016). Negative bubbles and shocks in cryptocurrency markets. International Review of Financial Analysis, 343-352
- [3] J.Matonis, "How Cryptocurrencies Could Upend Banks' Monetary Role," American Banker, [online], 26-05-2013
- [4] Robin D. Morris, Web 3.0: Implications for Online Learning, TechTrends (Volume 55, Number 1) Springer, January/February edition 2011
- [5] Zhang Yang, "The Development of Web and Library s Reference Service-from Web 1.0 to Web3.0," Sci-Tech Information Development & Economy, vol.18, 2009.
- [6] Dabit, N. What is Web 3.0? The Decentralized Internet of the Future Explained. Free Code Camp. 8 September 2021. (accessed on 5 January 2022).
- [7] Zhang, S. Y., Cheng, C., Chen, Z. M., Shi, Y. X., & Sun, D. L. (2020). Research on digital smart contract based on blockchain. Academic Journal of Engineering and Technology Science, 3(3), 74–80.
- [8] Ramsey Khabbaz, Web 3.0 Will Run on Cryptocurrency, A Q&A with crypto expert Jeff John Roberts. (accessed on May 10, 2022)
- [9] Dan Sheridan, James Harris, Frank Wear, Jerry Cowell Jr, Easton Wong, Abbas Yazdinejad, Web3.0 Challenges and Opportunities for the Market. (accessed on 6 Sep 2022)
- [10] Wenwen Ding; Jiachen Hou, JuanjuanLi, ChaoGuo, Jirong Qin, Robert Kozma, Fei-Yue Wang, DeSci Based on Web 3.0 and DAO: A Comprehensive Overview and Reference Model, Published in: IEEE Transactions on Computational Social Systems (Volume: 9, Issue: 5, October 2022)
- [11] Amber Smith, How Do Web 3.0 Cryptos Support the Development Of Decentralized Web Applications, published on blockchain council. (accessed on November 3, 2022)



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