Online Cryptocurrency Tracker

Using Blockchain Technology

A Project Report Submitted for the partial fulfilment Of

Bachelor of Technology Degree

in

Information Technology.

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Contents

Declaration

We hereby declare that this submission is our work and that, to the best of our belief and knowledge, it contains no material previously published or written by another person or material which to a substantial error has been accepted for the award of any degree or diploma of university or other institutes of higher learning, except where the acknowledgment has been made in the text. The project has not been submitted by us at any other institute for the requirement of any other degree.

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Certificate

This is to certify that the project report entitled "**Online Cryptocurrency Tracker using Blockchain Technology**" presented by **Mayank Maurya, Nitin Srivastava,** and **Rajat Agarwal** in the partial fulfilment for the award of Bachelor of Technology in Information Technology, is a record of work carried out by them under my supervision and guidance at the department of Computer Science and Engineering at Institute of Engineering and Technology, Lucknow.

It is also certified that this project has not been submitted to any other institute for the award of any other degrees to the best of my knowledge.

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Abstract

With the increasing popularity of online transactions in the Indian Monetary System, the possibility of online fraud by less aware people has become common news. As a solution to it, cryptocurrencies have emerged as a more secure and reliable source of online transactions as well as a valuable asset of investment too. Because they are very secure because of the blockchain technology they use, the chances of online fraud and theft hacking are negligible. For a person to have safe investments or transactions in the crypto world, it is always better to know the recent trends of the crypto market, the top-performing cryptocurrencies in the form of charts and ranks, and the daily news updates from the crypto market.

Our highly secure online cryptocurrency tracker aims to provide these necessary insights into the crypto world to the common masses in a simple, easily accessible, and understandable manner so that they do not need to go to any other place for the trends. As these markets are sentiment-based, getting the verified trends, news and possibilities are very crucial to be on the safe side. If a person has to go to multiple sites for updates, the chances of encountering fake news related to the crypto market are highly possible. So, we aim to solve this problem with the help of our online cryptocurrency tracker which will be a single go-to place for the trends, top cryptocurrencies, and news related to the market.

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1. Introduction

In the world of online transactions, the transparency of the transactions made has increased exponentially creating a new domain of tech products that are providing countless benefits and offers to their users. But as every good thing has its cons as well, the cases of online fraud, crimes, and other privacy threats have also increased drastically. Online transaction is still very unsafe for less-aware people who unintentionally share their details or get their systems hacked.

To rectify the above issues, blockchain comes to the rescue. It is a super-secure technology that is ideal for making transactions and other confidential documents secure. It is the future of online transactions. But since the current monetary system is yet to accept this technology, optional cryptocurrencies have been launched to make transactions secure and encrypted. These currencies have a separate monetary system and have emerged as the most popular investment source as well. With the increasing demand for cryptocurrencies, awareness of the crypto world is also very necessary. There are many crypto exchange apps in the market that people can use to buy and sell cryptocurrencies but no one focuses on keeping people aware of the crypto world by sharing news articles about the crypto world and investment strategies. People can easily buy and sell cryptocurrencies but there are very less applications that allow people to make transactions using cryptocurrencies.

So, we have developed "Crypto Nite" which is the single go-to place for all crypto needs. People can log in and connect their metamask wallet and do transactions using ETHEREUM. Users can track the performance of more than 50 cryptocurrencies as well. Also, Crypto Nite has of its kind news sections that focus on keeping our users aware of the crypto world.

2. Literature Review

As in earlier times, the field of cryptocurrency is not as new as Blockchain Technology is for us at present. Still, there is some historical background of cryptocurrency usage in earlier times.

The First known use of cryptocurrency was seen in the late 1890s, the idea behind it was the usage of a currency that would be untraceable and won't require any central institutions like a private or national bank for issuing purposes
.
The second known use was by famous American Cryptographer David Chaum in 1995, as anonymous electronic money which was later named Digicash. It was the first form of cryptocurrency which could be sent over software from the bank and required a public or private key for decryption at the recipient side.
Bitcoin (earlier called Bit Gold), was designed in 1998 by computer scientist Nick Szabo. Later Satoshi Nakamoto published an article, "Bitcoin - A Peer to Peer Electronic Cash System", on 31st October 2008. It was the first-ever article that described Bitcoin Cryptocurrency with the implementation of Blockchain Technology.

The work on Bitcoin Project by Satoshi formally began on 18th August 2008 when he purchased the domain Bitcoin.org. This was the time when the history of the most successful cryptocurrency Bitcoin was underway. The first Block of the Bitcoin network was mined by Satoshi on 3rd January 2009. The headline of the famous newspaper "The Time" is embedded by Satoshi to refer, to the economic preconditions that paved the way for the technical advancement of Bitcoin. For now, the present first block of 50 Bitcoins is known as, "The Genesis". Initially, Bitcoin had zero value for 6 months. After 6 months of Bitcoin development, its value rose to somewhat 14 cents (0.05 rupees). Later, Satoshi could able to buy a pizza out of it and by early November its value rose to 36 cents (0.13 rupees). At present, the price of 1 Bitcoin is 23,31,569.76 Rupees or 29,951.45 Dollars.

2.1 Related Works

1. Coinbase

Coinbase is an American-based MNC that provides the safest trading and investment platform for users all across the globe to buy, sell and exchange about ninety plus cryptocurrencies like Dogecoins, Bitcoin, Ethereum, etc. It consists of active 89 million users and has a total asset of 278 million dollars. Its GUI is simple and user-friendly which attracts beginners to try and invest in cryptocurrencies. There are additional features and premium versions of the application available for advanced users like "Coinbase Pro", etc. At present due to the lack of suitable and authentic content on cryptocurrencies, it is risky and volatile which is not suitable for every user. However, Coinbase is the safest and most promising application for any operation related to cryptocurrency in the market.

2.2 Motivation

As the digital transaction as a whole concept is pretty new in India and majorly prominent in urban areas, the lack of awareness is the sole reason for the crimes that happen very often in the online transaction world. This also contributes to people refraining from switching to online transaction mode. Since the online transaction is the new and crypto world is a solution to it, there is a need for a platform that makes people aware and satisfies all the needs for crypto in one place. Because depending on multiple sources for different things increases the chances of getting into a scam.

So we identified this gap as our problem statement and focused to tackle this issue with the help of our software solution. We aimed to create a platform where users can do transactions with cryptocurrencies and track all the currencies as well as stay updated and aware of the crypto world to prevent online fraud. This was the sole motivation behind working on "Crypto Nite" which is a single go-to place for all crypto needs. This will make a huge difference in making cryptocurrencies a more widely accepted mode and will ensure a safer world for all of us. It has all the answers to the questions that the above problem statement threw

to us. We have ensured the security and privacy of our users are of utmost priority and have used blockchain technology to implement transactions which is indeed the most secure way to do online transactions.

Also, the users can log in and signup with their email IDs and passwords or with google login as well. This introduction of google login makes the user experience more convenient and secure as the login with google requires just two clicks. This was the motivation behind developing an Online Cryptocurrency Tracker with news as well.

3. Methodology

Some of the features of the web application that we have developed will be as follows: -

1. It is a website named "Crypto Nite" which will be a single go-to place for all the cryptocurrency requirements.

2. It has an onboarding module that has login and sign-up functionalities. Users can log in and signup using email and password and also, they can log in using google login which is very handy and secure

3. It has a landing dashboard that the user encounters after login. It comprises a navigation header that allows users to choose between different sections of the web application.

4. This dashboard consists of 4 modules. The first one is the Market Module where users can see the list of all the cryptocurrencies present in the market and their overview details.

5. Users can also see the detailed report of a currency including a performance chart by clicking them.

6. The second module is the Exchange module where users can connect their metamask wallet and make transactions using ETHEREUM cryptocurrency.

7. The transaction details get automatically stored on the blockchain forever.

8. The third module is the News Module in which the user can see the list of recent news related to the crypto world and can read the articles by clicking on them.

9. The 4th and the last module are the logout module which allows user to log out from the app if they don’t want to use it for a while.

3.1 System Design

3.1.1 Data Flow Diagram

The system design is described using data flow diagrams.

Figure 1 shows the overall data flow diagram for our website. It clearly describes all the flow of data in our web application as well as all the modules on our website.

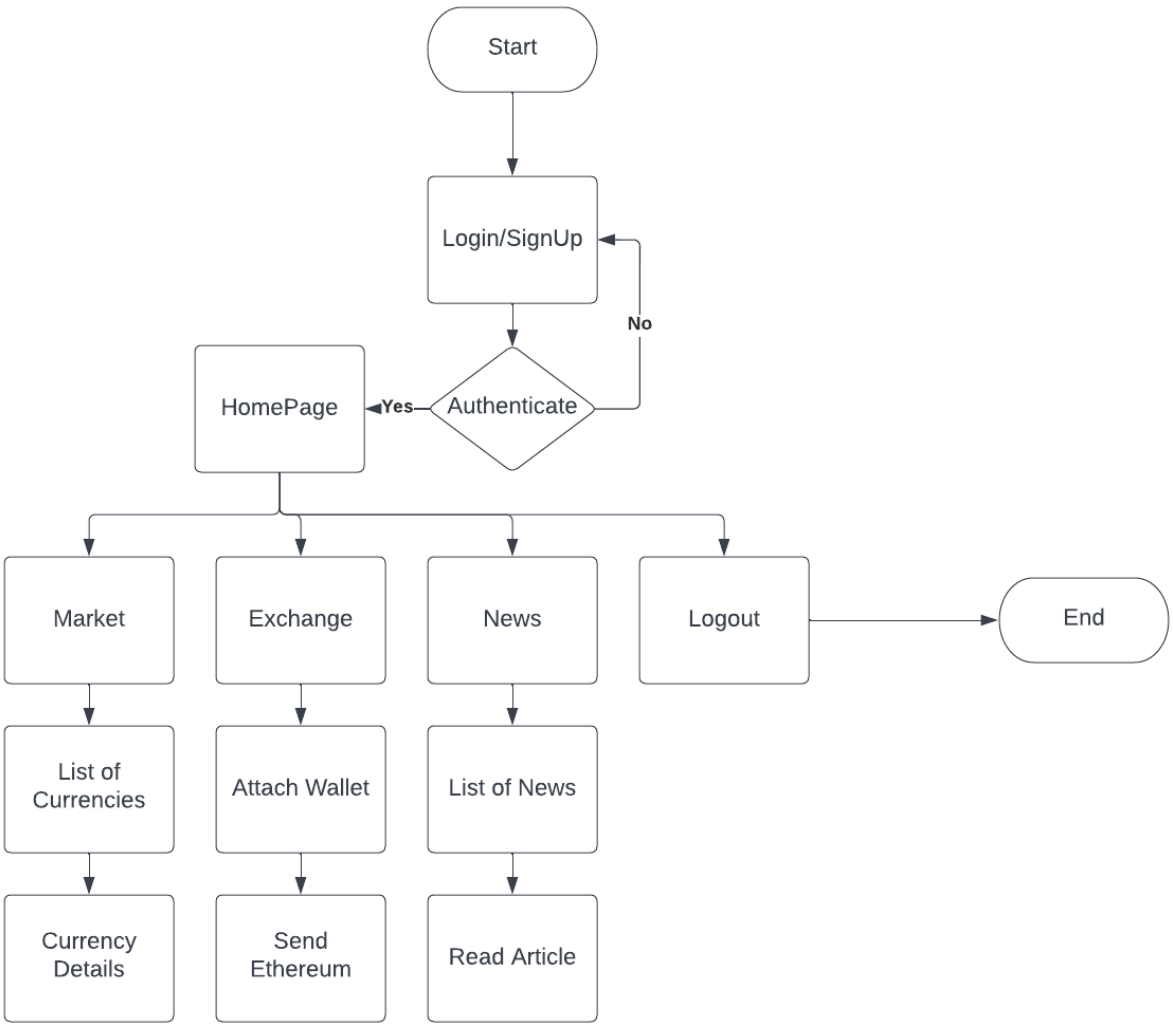


Figure 1. Data Flow Diagram for our application

Figure 2 is the data flow diagram for the user onboarding module. This has signup and login features using email and password or either google login.

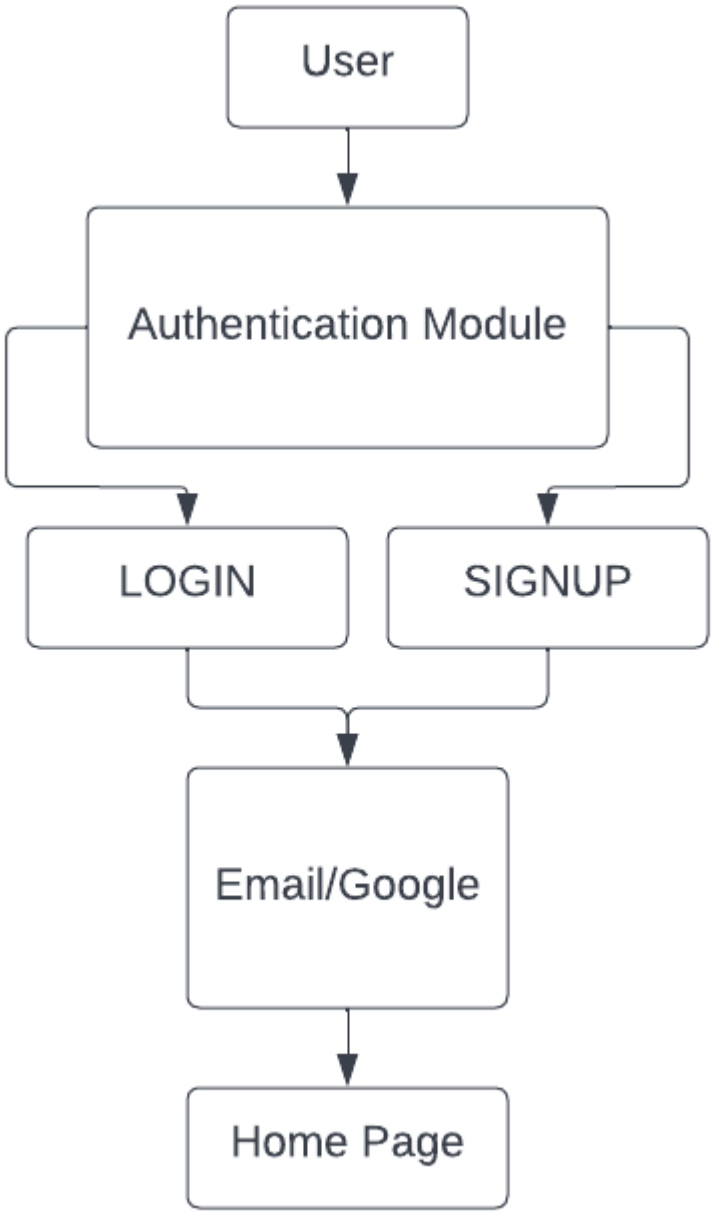


Figure 2. Data Flow Diagram for Onboarding Module

Figure 3 describes the Data Flow Diagram for the Transaction Module for our application. The users can connect their metamask wallet and pay the cryptocurrency called Ethereum with our application.

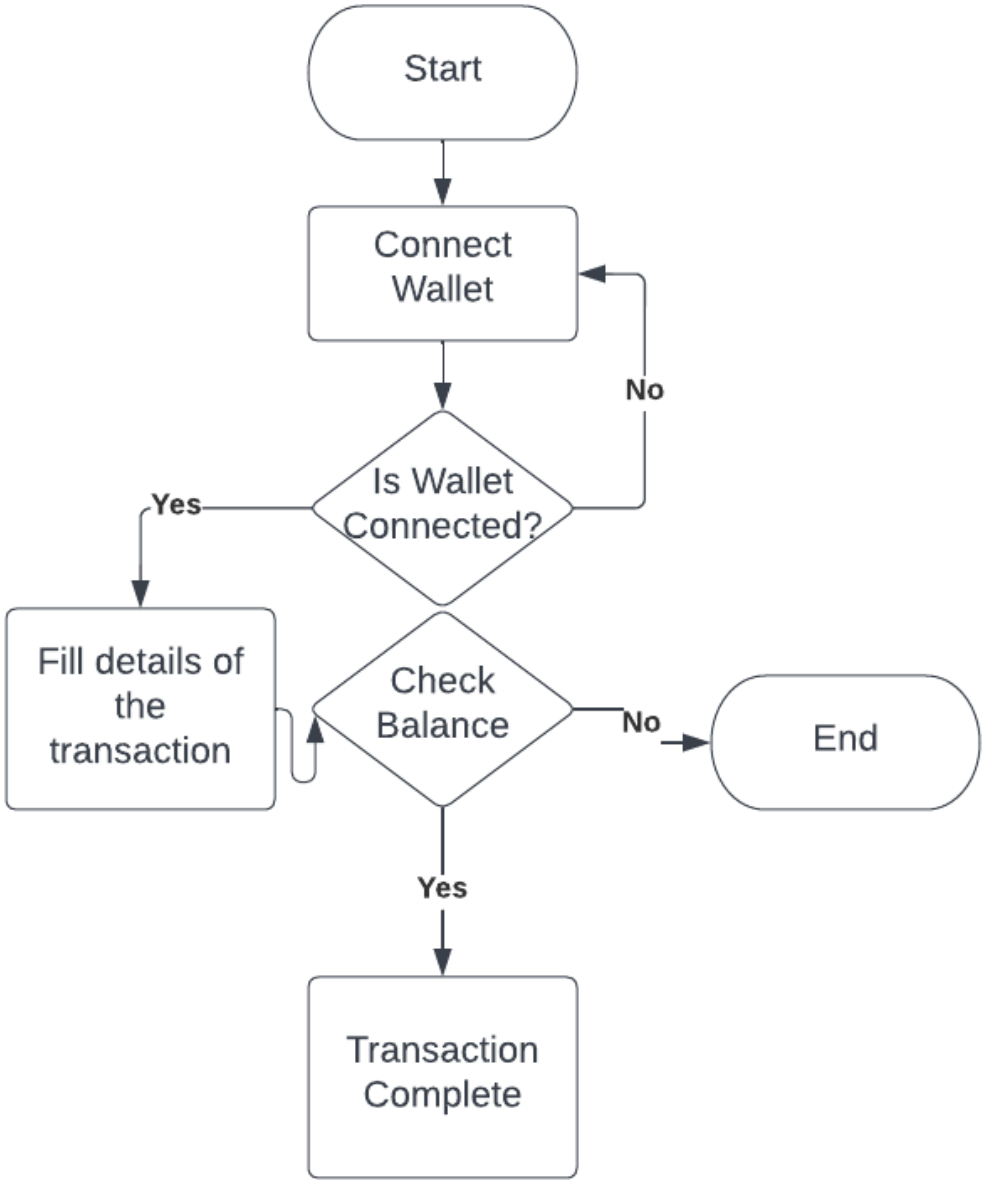


Figure 3. Data Flow Diagram for Transaction Module

Figure 4 describes how the data is modelled in our database. In our app, every user can have their name, userId, email ID, and transactions list and for every transaction, we have transaction ID, amount, date, and time.

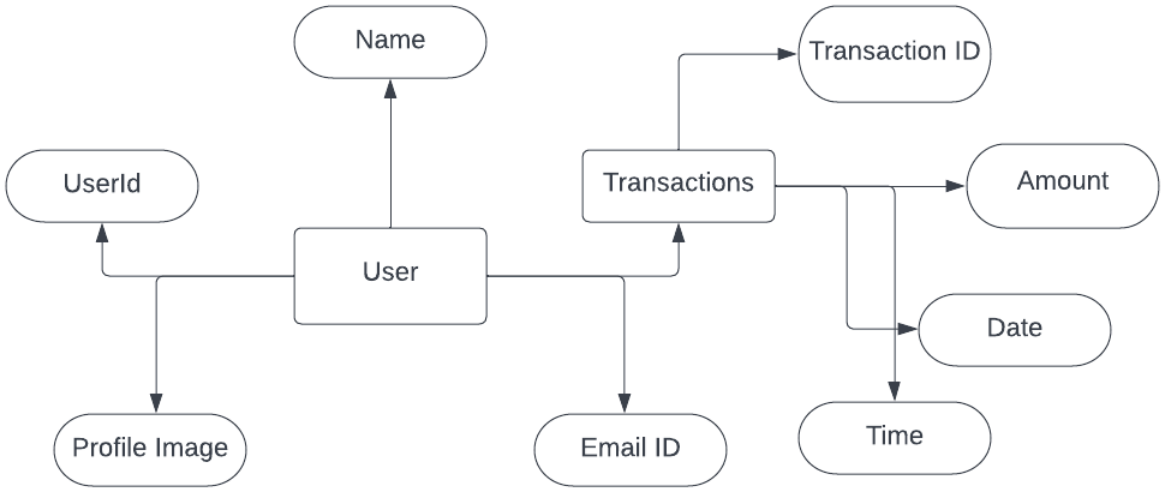


Figure 4. Sample Data Model

Major technologies used in the whole process are described as follows:

● Backend- Firebase

● GUI Frontend- HTML/CSS, Bootstrap, JavaScript, React.Js, Web3.0, Solidity

● IDE- Visual Studio Code

● Database- Firebase Realtime Database and Blockchain

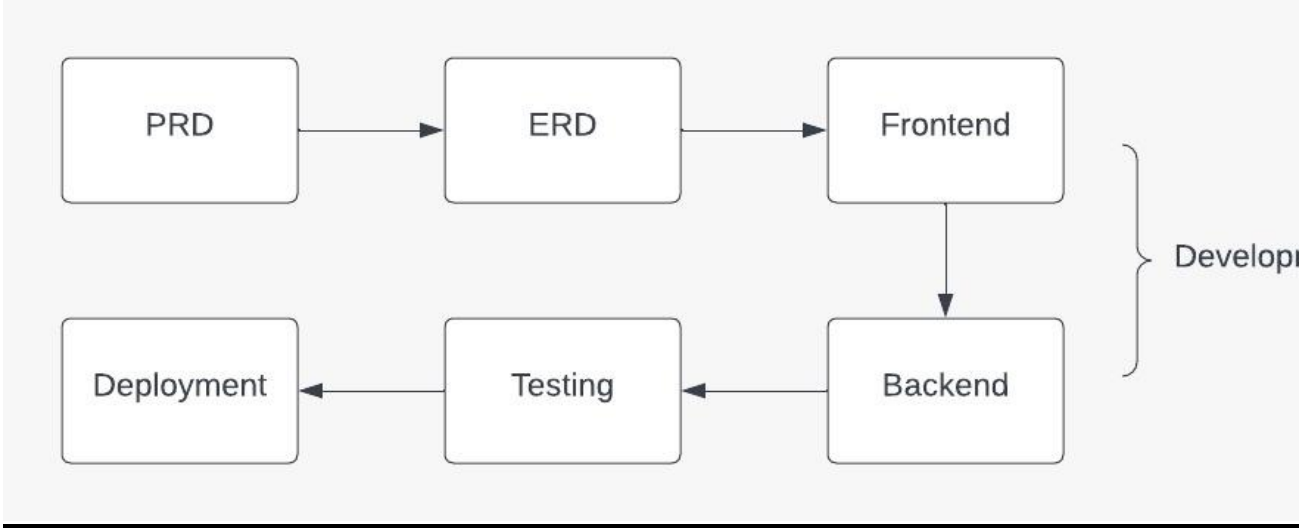
● API Usage- Google Auth Rest API, Coinranking API, and Bing News Search API

● Version Control System- Git Bash, GitHub

● Deployment- Heroku

● Other tools- Jest, Postman, Joi Current Login UI

3.1.2 Terminologies used



● PRD (Product Requirement Document)

All the requirement of a certain product are contained by a product requirement documents (PRD) it helps in clear understanding of product's objective. However, a PRD do not define technical part of the product which are handled by interface designers and engineers with their expertise to provide optimal solution.

● ERD (Engineering Requirement Document)

The goal and purpose of a new component is described by engineering requirement document (ERD) like a product requirement document (PRD). An ERD tells engineers why a part is being build and what purpose is fulfils. By ERD engineers ensure that customer needs are satisfied.

Software Development Life Cycle (SDLC) model:

● Agile model

Agile software development is a collection of several software developmental methodology which are based on certain development methods by which different functional team collaborate in a project. Agile process ensures discipline projects management process with certain features like accountability, self-organization, encourages teamwork, promotes leadership philosophy, adaptation and frequent inspections. It is a best set of engineering practices which allow developers to allow rapid delivery of high-quality software. It also ensures best business approach which not only satisfies customer needs but also fulfils company goal. The concept of Agile Manifesto is aligned with development process of agile process.

Deployment Phases:

● Staging (on Heroku) - The duration of sprint will be of one month for PRD, ERD and UI development, it will utilize first two sprints, as it is not dynamic but static. Hence this makes integration and testing of project much easier. Agile model's incremental aspect will be used for backend features. Implementation of certain features like authentication, user model, etc will be done in prototype. Addition of certain features will be integrated into the solution of subsequent prototypes of the application. The backend will minimum take three sprints after first two sprints which are allocated for PRD, ERD and UI development.

3.2 Onboarding Flow: -

Users can create their accounts on our website to get a personalized experience. They have an option to Signup and Login into their accounts.

1. Signup Flow:-

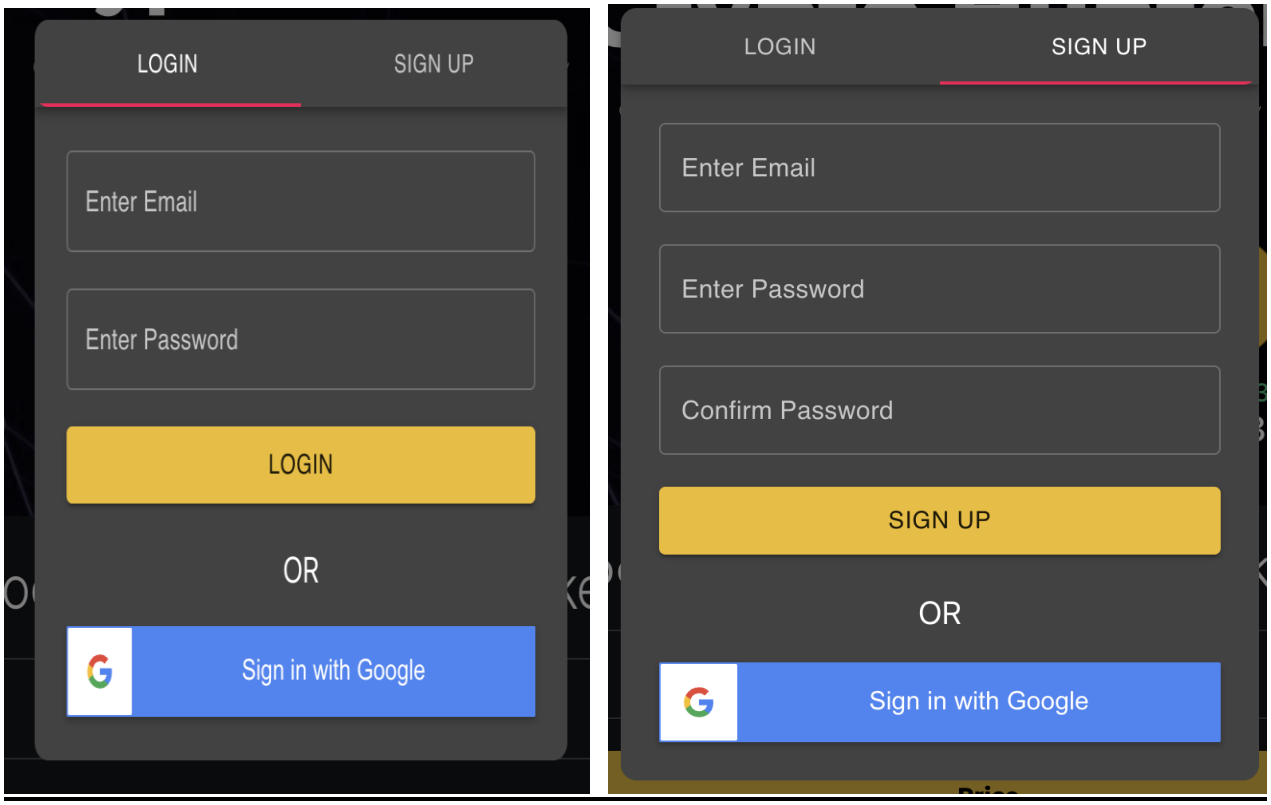


Figure 3.2.1 The Signup Flow using email and password

New users can “Signup” on to our website using their email id and creating their password. The whole signup flow is implemented with the help of Google Firebase backend which stores users' credentials in a highly confidential environment. The registered users can log in to their account using their email id and password with which

they have previously signed up. This whole module is implemented with the help of Google Auth Rest API.

2. Google Authentication :-

The users also have an option to Sign Up and log in with the help of their Google accounts already logged in to their browser. This facility enhances user experience as entering passwords and email ids every time doing login is a very tedious task. This enables a fast-working environment where users can efficiently use their email ids and instantly log in to their accounts with just two clicks.

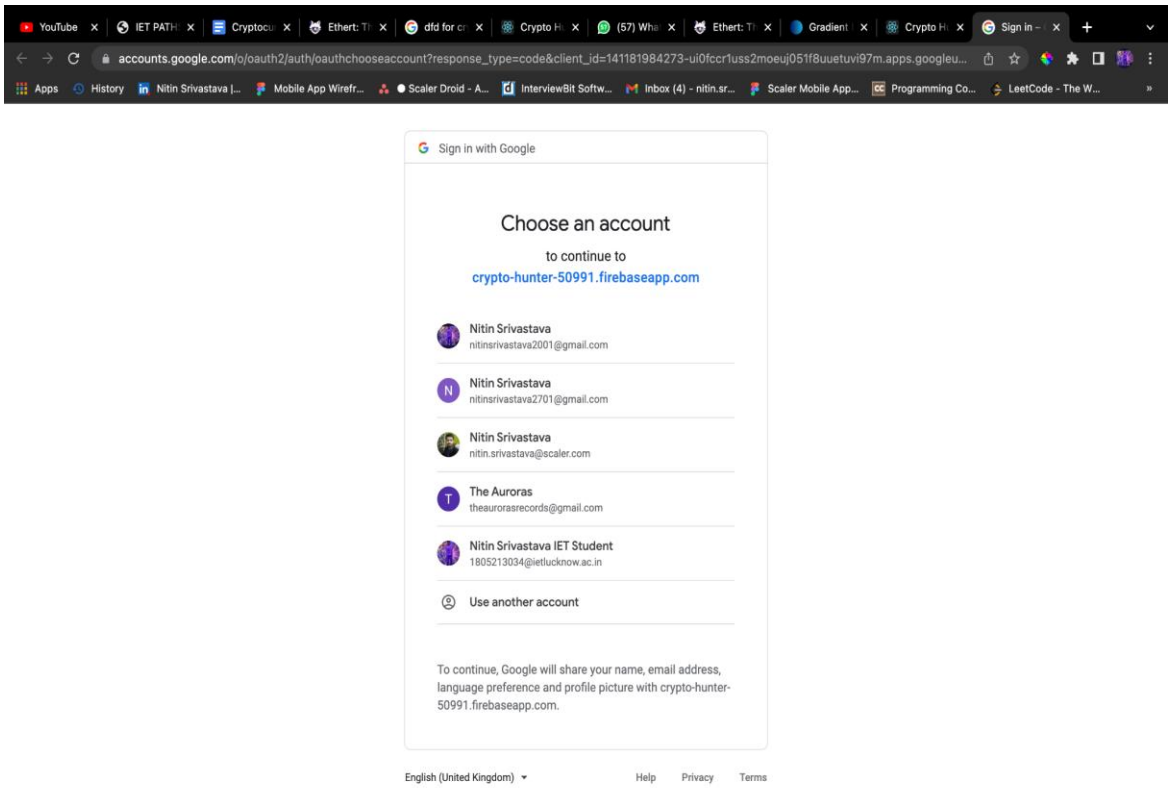


Figure 3.2.2 The Signup Flow with Google login

3.3 Market Flow:-

3.3.1 Currency List-

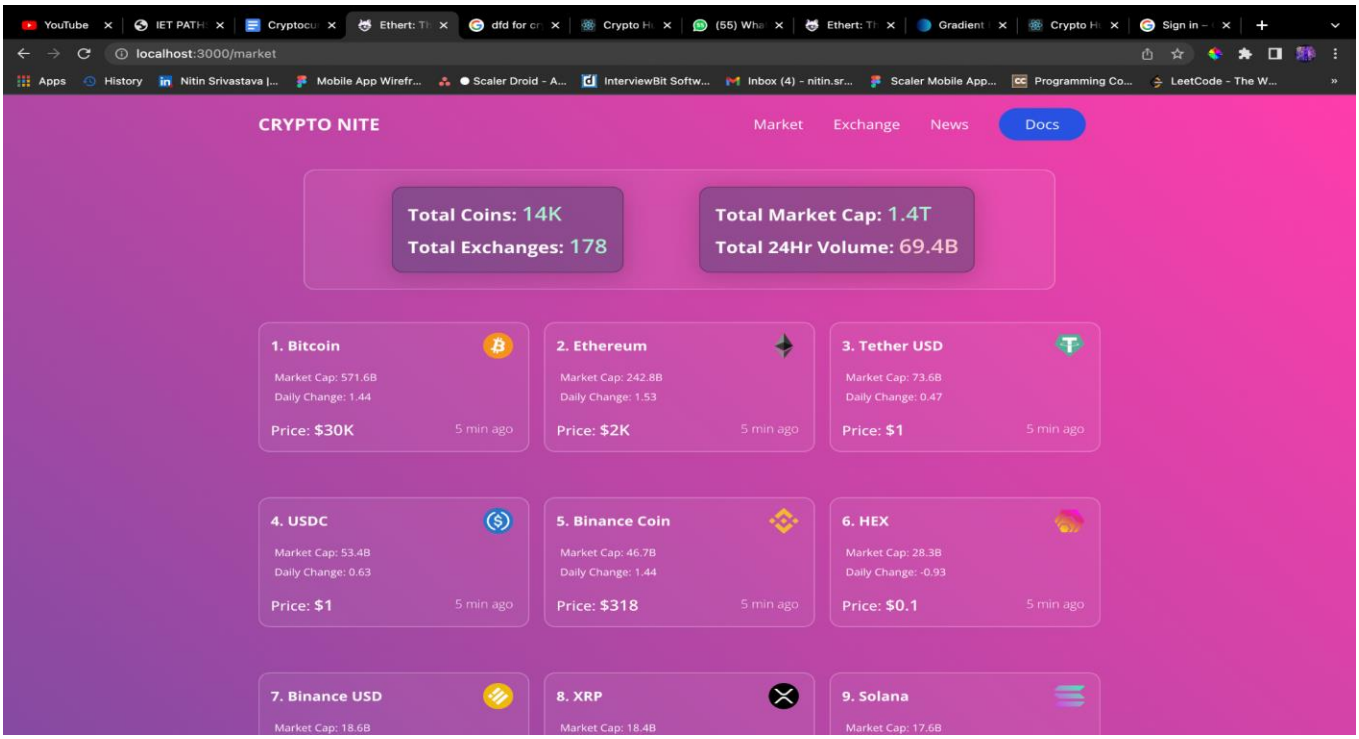


Figure 3.3.1 Currency List

Under the market tab, users can see the whole list of cryptocurrencies along with their prices, market cap, and daily change. Also, users can have a look at the overall crypto market cap and its value in the overview section which is provided at the top under the market section.

3.3.2 Currency Details:-

Figure 3.3.2 Currency Details

On clicking each cryptocurrency in the market section, users can have a detailed view of a particular cryptocurrency along with its performance chart. Users can also filter the chart data based on time. They have the option to see the past 24 hours performance, past 30 days performance, past 3 months performance, and past 1-year performance. They can also see the rank, currency price, and the market cap of a particular currency in the currency details screen.

3.4 Currency exchange:-

3.4.1 Connecting Wallet:-

Users can also connect their meta-mask wallet by entering their password for the wallet. The email Id registered with the Crypto Nite should be the email with which the user's wallet is registered. After Connecting their wallet, users can check their Ethereum balance and make payments in Ethereum to other meta-mask account holders.

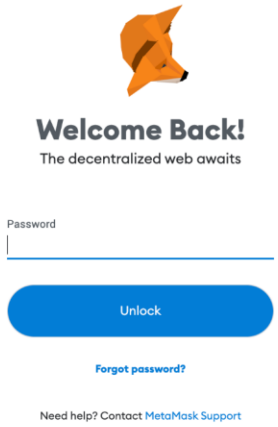


Figure 3.4.1 Connecting Wallet

3.4.2 Creating the Transaction:-

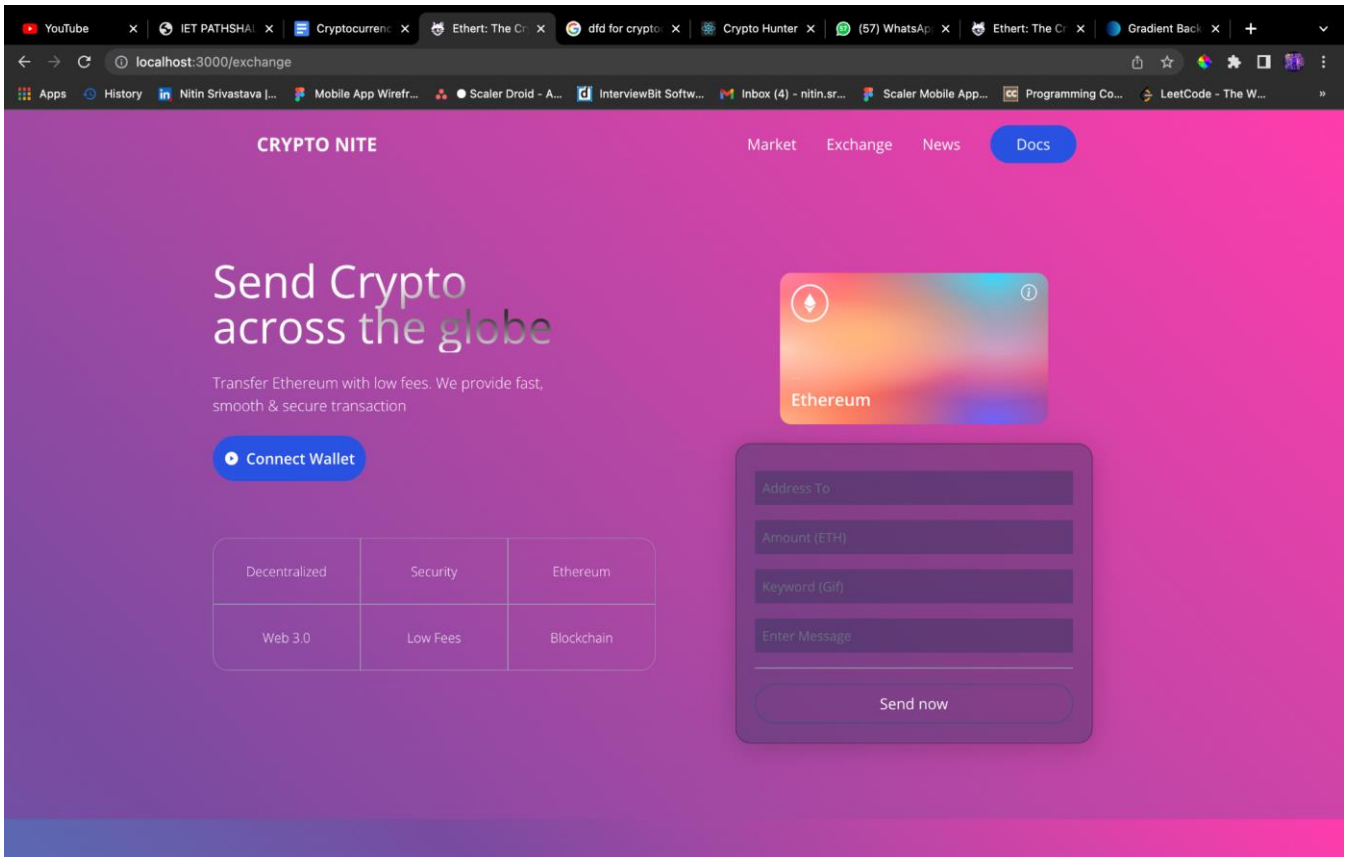


Figure 3.4.2 Creating Transaction

After connecting the meta-mask wallet, users can see the Ethereum balance in their accounts on the exchange page. Now, to make payments, users can fill in the recipient's meta-mask account number, amount, keyword, and a message to the recipient. As soon as the user clicks on send now, the meta-mask wallet initiates the transaction into the user's account after two-step confirmation. As soon as the transaction completes, the transaction details get stored on the blockchain forever.

3.4.3 Transaction History:-

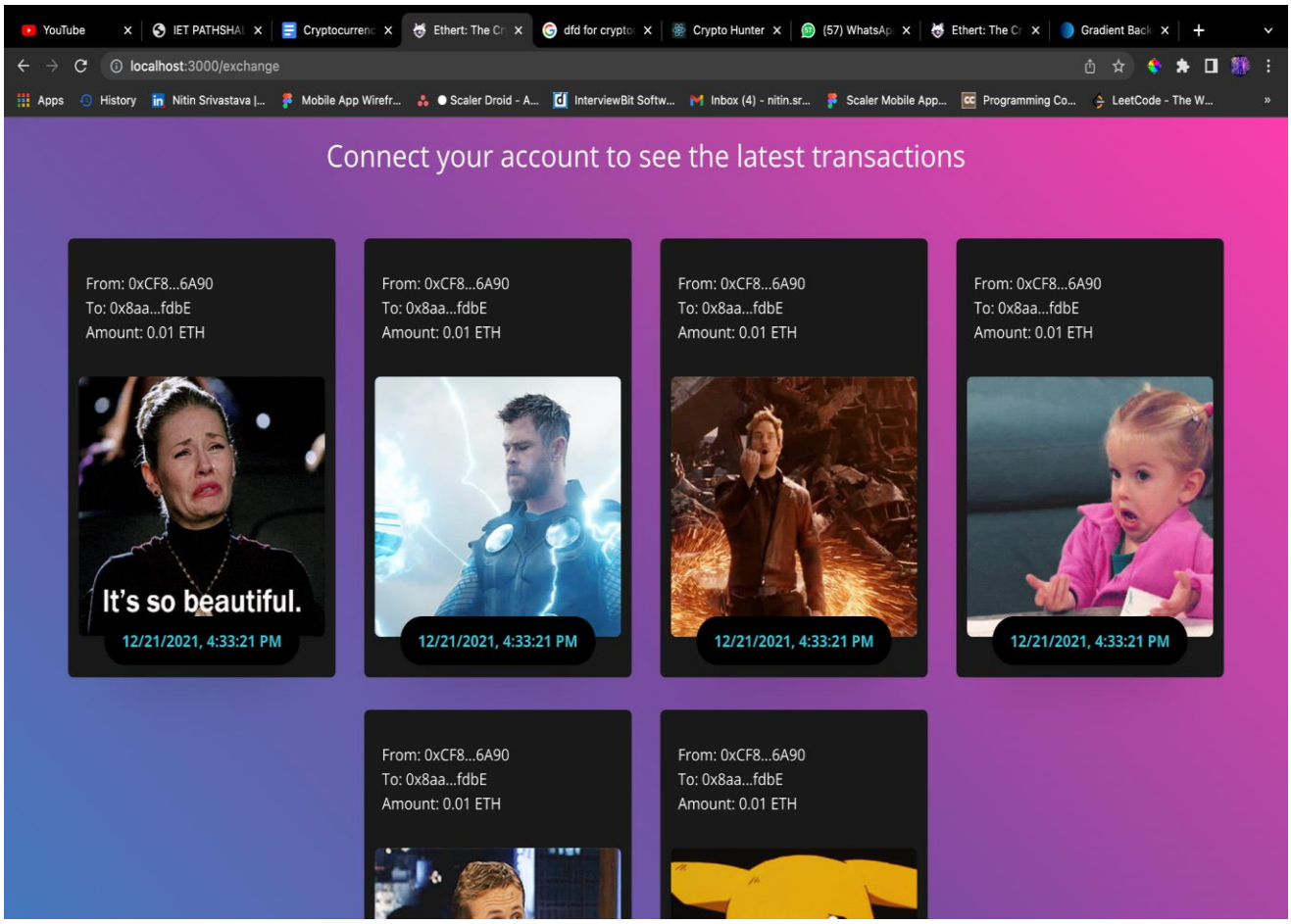


Figure 3.4.3 Transaction History

After initiating the transaction, the transaction history gets stored permanently on the blockchain which will be 100% safe and secure, and as well as decentralized. Users can see their previous transactions in the latest transaction section under the exchange module. The transaction gets stored with the amount, date, and time timestamp and as well as a nice sad gif that indicates a loss (which no one wants).

3.5 News Module:-

3.5.1 News List:-

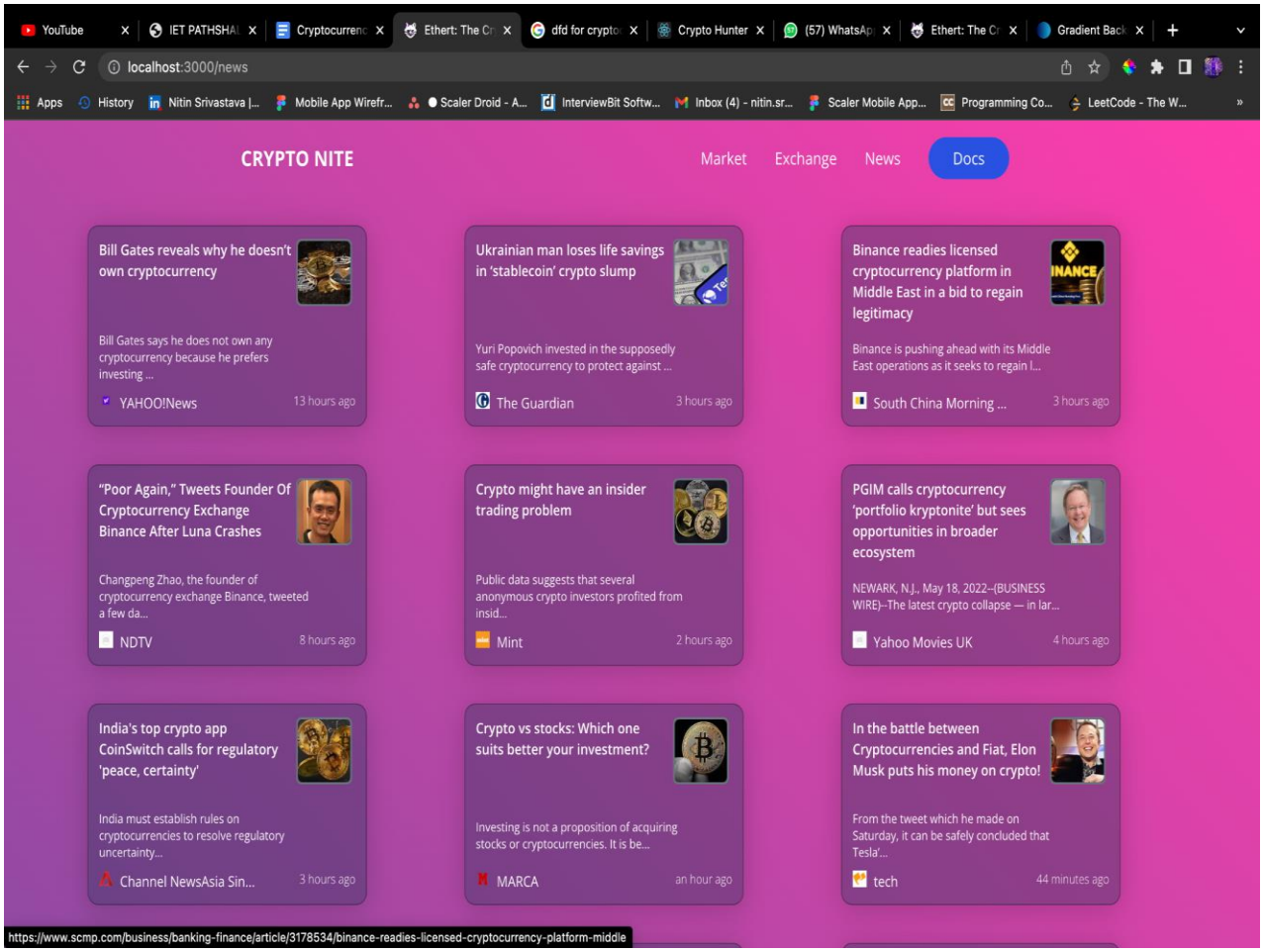


Figure 3.5.1 News List

In the news module, users can see the list of the latest news articles related to the crypto world and can keep themselves updated with the latest development in the crypto market. The crypto world is very new and thus is very fast-moving so it is very crucial to stay updated with the latest news. Crypto Nite is a very effective tool for achieving that goal.

3.5.2 Read Articles:-

After clicking on a particular news item under the news section from the news list, users can read full articles in detail. This is also a very useful feature we have introduced in Crypto Nite. It makes our application very handy for our users.

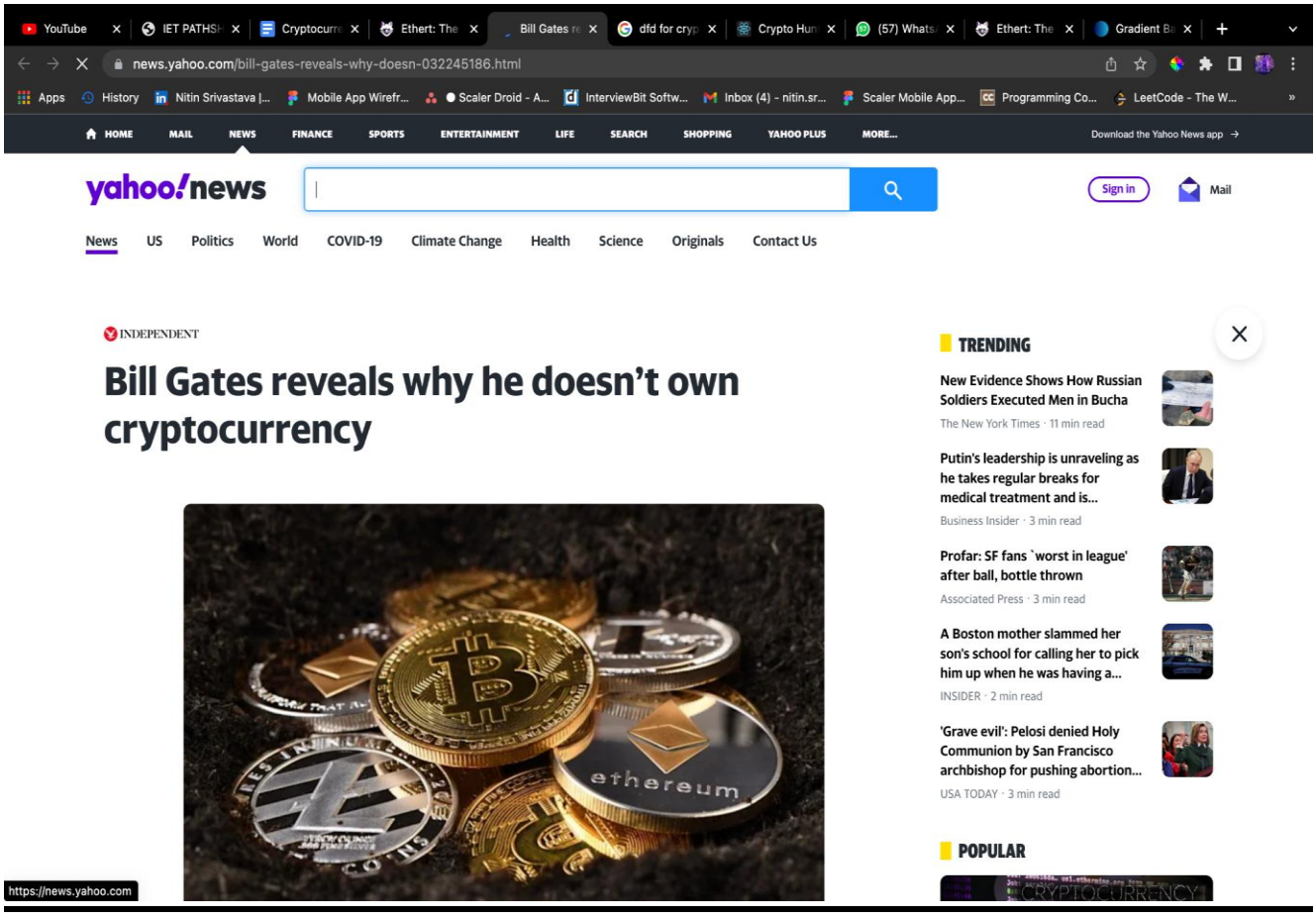


Figure 3.5.2 Read the Articles in detail

3.6 Dashboard:-

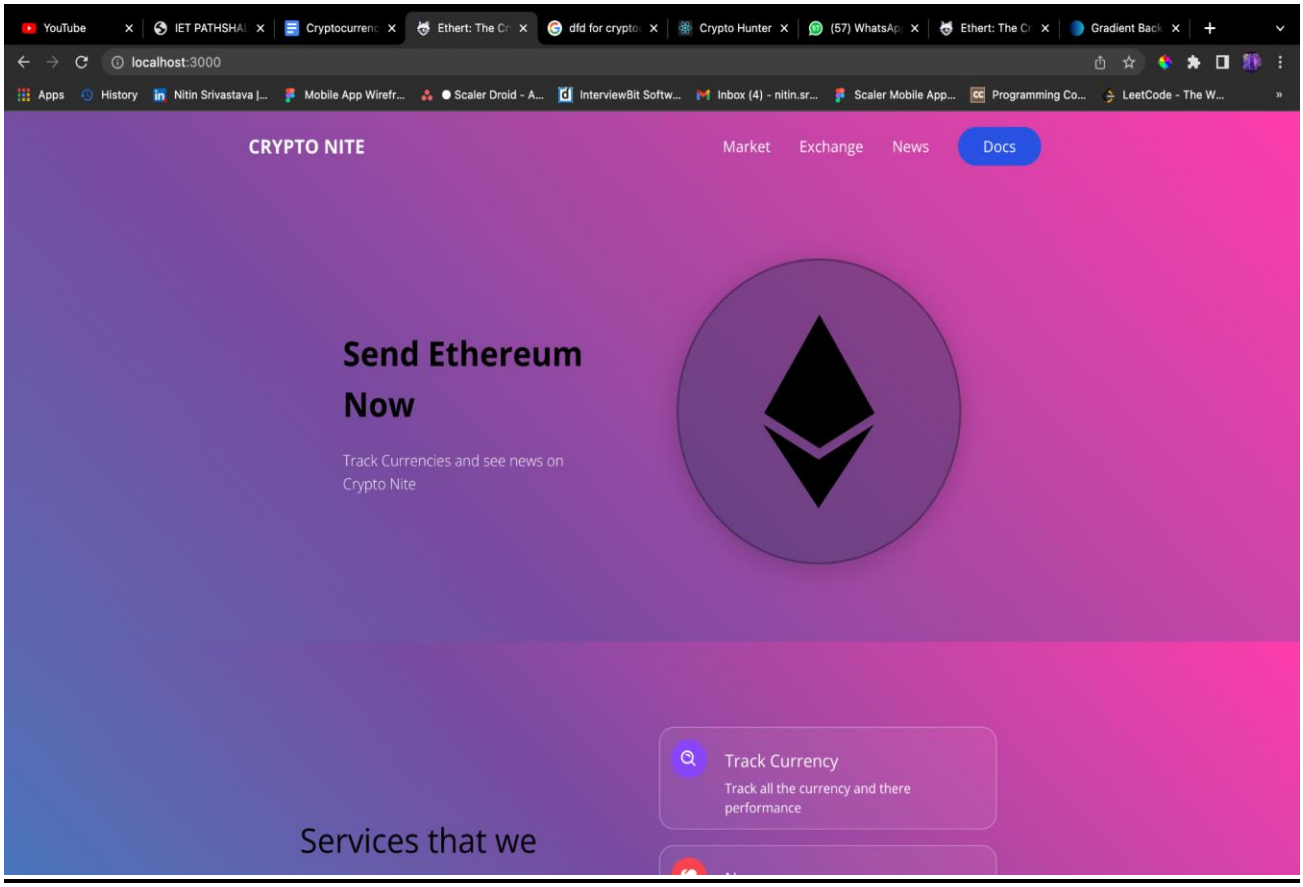


Figure 3.6 Dashboard

After Completing the login and Signup process, users land on this dashboard. Here, users can have a brief overview of what is Crypto Nite and what are the features of our web application. In the navigation bar, users can choose between 4 modules according to their requirements and can make the best use of our web applicat

4. Plan Of Action

4.1 Plan of Action Time Chart:-

	FEB				MARCH				APRIL				MAY			
Activities	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Documentation, Tech stack review and design	document ation	API Revie w	Screens workflow and Figma design													
Frontend Coding					Coding Frontend in React.js											
Backend Coding									Backend is blockchain and express API							
Testing and Deployment													Testing on different devices and deploying on Heroku			

Figure 4.1 Plan of Action Time Chart

4.2 Plan of Action Time Sheet:-

Months	Stage of Development	Details
Dec 2021	PRD, ERD (*first 20 days*), Figma Design	• Login UI Design • Dashboard UI Design • Market UI Design • Exchange UI Design • News UI Design
Jan 2022	UI Development	• Login UI Development • Dashboard UI Development • Market UI Development • Exchange UI Development • News UI Development
Feb 2022	Backend Development	• Authentication • Google login functionalities • Wallet Connection (Class/Institute) • Transaction Functionality
Mar 2022	Backend Development	• Transaction Functionality • Getting Currencies List • Getting News List • Logout Functionality
Apr 2022	Backend Development, Testing	• Login Testing • UI Testing • Transaction Testing • Integration tests
May 2022	Testing, Deployment	• Staging/Heroku deployment • Unit tests and integration • Presentation Preparation • UI Final Touches • Product Documentation/Report

Figure 4.2 Plan of Action Time Sheet

5. Conclusion

5.1 Conclusion:-

The result of the mentioned methodology and planned action will be a highly interactive UI that would also provide a safe and secure investment environment for users. This application also provides a complete portfolio for the crypto world. It covers all essential parts of cryptocurrency and provides the user with the most authentic, verified, and safest data to surf, exchange, invest or withdraw among various cryptocurrencies. Also, blockchain technology implementation makes the whole process encrypted and tackles all drawbacks of the centralized database system, which makes this technology most promising in near future.

5.2 Future Works:-

Crypto Nite is an effective platform for trading cryptocurrencies online. It provides an all-over safe and sound environment for users. It is user-friendly, and simple to use with would attract beginners. Due to the surplus of fake information floating on the internet, many users get baffled by it and end up getting a victim of it. To counter this issue, we implemented authentic pages of verified news and rates of cryptocurrencies.

There are also various dimensions in which improvement can be made for providing the next level of user experience. We can also implement a section for advanced or experienced users which would give them a more seamless, fast, and secure environment. This could be achieved by selling premium membership of our application**.**

We also cannot deny the fact of future implementations of blockchain technology. In the latest budgeting of India's financial year 2021-22, the finance minister announced the launch of India's first digital currency by RBI which would be based on Blockchain Technology. Also, it is undeniable that various banking platforms can also adopt this technology to counter all sorts of

transactional or financial loss. At present, the central government is also imposing a tax on the withdrawal of cryptocurrencies, from users, which makes cryptocurrency sort of legal and safe investment. We would also like to implement the various Indian digital currencies in our application and work on more dimensions of it.
We are also new to Blockchain Technology, and we wish to unlock more dimensions, features, and various innovative implementations of it in near future.

Due to constraints of time as well as resources, we couldn't implement these more features but this part could also be done in the future as it will widen the scope of the application.

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