

WellFund

System Requirement Specification (SRS)

Project work Phase 1
(EAI753)

BACHELOR OF TECHNOLOGY
(CSE – Specialization in AI, ML & DL)

PROJECT GUIDE:

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Dec, 2022



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1. Introduction

WellFund is a decentralized application based on Ethereum blockchain platform that allows users to invest money to the campaigns that interest them. By using blockchain, we can make sure that the investors engage in low-risk support of new ventures and venture creators can gain more supporters globally making it easy for them to raise large amount of funds in minimal time. Especially in blockchain world at present, there are lot of projects created by individuals or small-distributed teams that want to raise funds by issuing tokens to the investors. Crowdfunding platform simplifies the whole idea of raising capital with help of global public that might be interested in the campaign for an incentive that is profitable to the investor.

Few established crowdfunding platforms such as Kickstarter and Indiegogo have revolutionized the start-up world with the flexibility and efficiency in raising funds. Blockchain based crowdfunding might be the next step in evolution of fundraising platforms assisting start up founders in the journey of building their dream idea.

The major issues with these established crowdfunding platforms are that they are centralized bodies controlled by a corporation charging high fees and influencing campaigns. Blockchain based crowdfunding platform can help this process by decentralizing the funding model from the likes of Kickstarter and other companies.

Blockchain's distributed ledger helps in getting rid of the centralized intermediaries such as Kickstarter and Indiegogo that take huge amounts of money from a campaign as a maintenance fee. Blockchain crowdfunding is a purer form of crowdfunding as it removes any intermediaries between the backers and the start-up [1].

Crowdfunding dapp allows creators to post their campaigns and then soliciting funds from a community of interested people. Once the funding is successful, it returns the backers with campaign specific tokens or if the campaign fails, it returns the backer with his investment. All these multiple transactions are accounted for and kept track of by blockchain, immutable distributed ledger, and thus it is impossible to forge. Blockchain also gets rid of the influence and manipulation done by the centralized crowdfunding platforms that have more than required access to the campaigns running in their platform.

1.1 Problem Statement

Crowdfunding is one of the most popular ways to raise funds for any project, cause or for helping any individual in need. With the onset of Covid we have seen a rise in Crowdfunding activities across the globe which includes small campaigns to help people get oxygen and medical help to large funds such as PM Cares. The major problems with the Current Crowdfunding Platforms that we wanted to solve were:

(a) **Security:** As the funds become larger, they need to be heavily secure, although stringent measures such as symmetric encryption are in place to make e-payment safe and secure, it is still vulnerable to hacking. Blockchain - which has never been compromised yet - can provide that level of security.

(b) **Transparency and Anti-Fraud:** We have seen, and continue to see a lot of crowdfunding scams happening around. There is no way to see where the funds are being used. We wanted to make the entire flow of funds transparent at every stage, so that there is no possibility of the money being misused.

(c) **Global contribution:** With some of the platforms being country specific, it becomes hard for people from other countries to contribute to various campaigns. Using blockchain anyone in the world can contribute to the campaign. Transactions are quick and convenient.

We were highly inspired by the CryptoRelief initiative (www.cryptorelief.in), which raised ~1 billion dollars for Covid Relief in India from the entire global community, in a highly transparent manner.

1.2 Scope of the project

- Scope: With WellFund we aim to make the crowdfunding process transparent, anti-fraudulent and secure.
- Technical Feasibility:
 - It is to be a ReactJS based application, which will be supported by any web browser.
 - Internet connectivity will be required.
 - Users will require 'Metamask' browser extension to sign transactions.
- Social Feasibility:
 - Crowdfunding over the years has helped people but has also seen heavy frauds in the name of Crowdfunding.
 - With WellFund we want to bring transparency to the process of crowdfunding and build trust among people to contribute to all the causes.
- Economic Feasibility:
 - Given the Ethereum Blockchain provides us with most of the security features, the development does not require much cost.
 - The only cost would be the server cost of the deployed application.

1.3 Definitions, Acronyms and Abbreviations

• Definitions

- Blockchain: Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An *asset* can be tangible (a house, car, cash, land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs

for all involved.

- Smart Contract: Smart contracts are computer programs or protocols for automated transactions that are stored on a blockchain and run-in response to meeting certain conditions. In other words, smart contracts automate the execution of agreements so that all participants can ascertain the outcome as soon as possible without the involvement of an intermediary or time delay.
- Decentralization: In blockchain, decentralization refers to the transfer of control and decision-making from a centralized body (individual, organization or any group) to a distributed network.
- Peer-to-Peer: The crypto-currencies are exchangeable on a peer-to-peer network. This usually help the people for their investment which even generates more interest in the entire process.

- **Acronyms and Abbreviations**

- DAPP or dApp Decentralized Application
- DPoS Delegated Proof of Stake
- GPU Graphical Processing Unit
- IDE Integrated Development Environment
- RAM Random Access Memory
- SDRAM Synchronous Dynamic Random Access Memory
- GB Gigabyte
- P2P Peer-to-Peer

1.4 References

- Blockchain & Smart Contracts: <https://www.dappuniversity.com/articles/how-to-build-a-blockchain-app>
- CryptoRelief platform: <https://cryptorelief.in>
- Next JS Documentation: <https://nextjs.org/>
- Learning Solidity Language: <https://cryptozombies.io/>
- web3.js - Ethereum JavaScript API: <https://web3js.readthedocs.io/en/v1.3.4/>
- How data is stored in Ethereum Blockchain: <https://laurentsenta.com/articles/storage-and-dapps-on-ethereum-blockchain/>
- Metamask Ethereum Wallet: <https://metamask.io/>
- Ethereum Test Network: <https://www.rinkeby.io/#stats>

2. Project Description

Any web-based application is a centralized application which means that anything we do on the platform is managed by a server which is owned by a single company. WellFund is a Decentralized Application powered by Ethereum Blockchain, where all the information about campaigns, contributions, withdrawal requests and funds are kept on a Blockchain Network, visible to all and decentralized. This means the funds and transactions are visible to and stored at every node on the blockchain, and prevents the data from being stored in a centralized server, single location. Hence not letting the money get into the hands of anyone and eliminating every possibility of it getting misused - an elegant and logical solution to the problem in hand.

2.1 Scope of the work

- Scope: With WellFund we aim to make the crowdfunding process transparent, anti-fraudulent and secure.
- Technical Feasibility:
 - It is to be a ReactJS based application, which will be supported by any web browser.
 - Internet connectivity will be required.
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- Social Feasibility:
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- Economic Feasibility:
 - Given the Ethereum Blockchain provides us with most of the security features, the development does not require much cost.
 - The only cost would be the server cost of the deployed application.

2.2 Project Modules

- a) Creating a Campaign: Just like Crowdfunding in the real world as well as on other crowdfunding platforms, anyone can create a campaign in a few minutes. The campaign information will be managed by the Ethereum-based smart contract and thus cannot be tampered with.
- b) Contributing to a Campaign: Once a campaign has been created, users can share the campaign and anybody can contribute to the campaign. The funds will go to the address of the campaign and not to the creator of the campaign, thus making the process more efficient and anti-fraudulent.

- c) **Withdrawal of Funds:** The Creator of a Campaign can propose how to use the funds in the form of a Withdrawal Request. Anybody who contributes more than a particular amount is called an approver, and will be able to approve or deny the request. Funds can't be withdrawn without the approval of 50% approvers.

2.3 User Characteristics

There are 4 types of users for this module:

- **Admin/ Administrators:** The group of users that has the highest level of permission.

They can:

- Update System
- Add/Remove Users
- Approve/ Reject Projects or campaigns
- Handle notifications

- **Fund Seeker:** The entity/organization/user that is in need of the funds

They can:

- Register
- Create Campaign
- Withdraw Funds

- **Funder/ Contributor:** The entity/organization/user that contributes for funds

They can:

- View Campaign
- Contribute to any campaign

- **Normal Users:** They can:

- View all the ongoing completed campaigns, their statistics and other details related to the campaign like its cause, amount, etc.

2.4 Constraints of project

Crowdfunding with some risks associated to it. The risks associated with crowdfunding include greater risk of loss, liquidity risk, and the potential for non-accredited investors to lose money. So, to ensure the transparency and credibility, greater transparency among the stakeholders, secure and effective transactions and fund transfers, better data protection and traceability, it must adhere to all the blockchain standards and constraints.

2.5 Assumptions and Dependencies

- The public will be willing to contribute towards the project activities.
- All users must use crypto currencies.
- All users of the public have access to crypto wallet.
- All the users have access to Internet.

3. Specific Requirements

3.1 External Interfaces

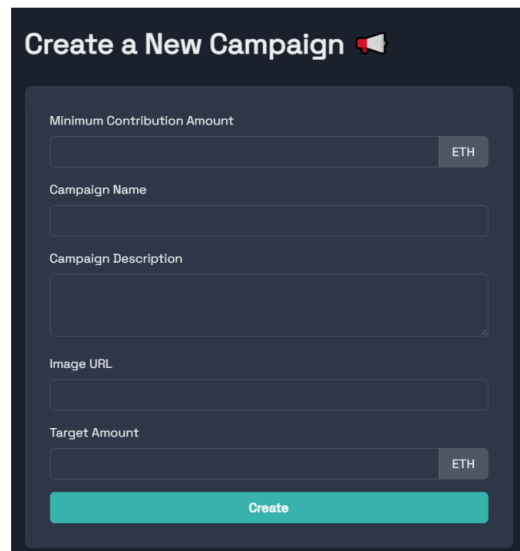
The dApp of WellFund will have its logo on the top-left corner and the navigation bar on the other side. It will be having a flex-box arrangement of the ongoing campaigns. It will be like:

- Social Icons: this contains the social links of the platform.
- Logo: the logo of the platform
- Navigation Bar: this contains various buttons
 - Home: to navigate to home
 - Discover: to discover new/ongoing campaigns
 - Create: to create a new campaign
 - Login: to login being a new user
 - Register: to register as a new user
- Campaign Flex: displays the completed and ongoing campaigns
- Footer Menu: contains the further details
- Copyright: contains the copyright

3.2 Functions

1. Creating a Campaign:

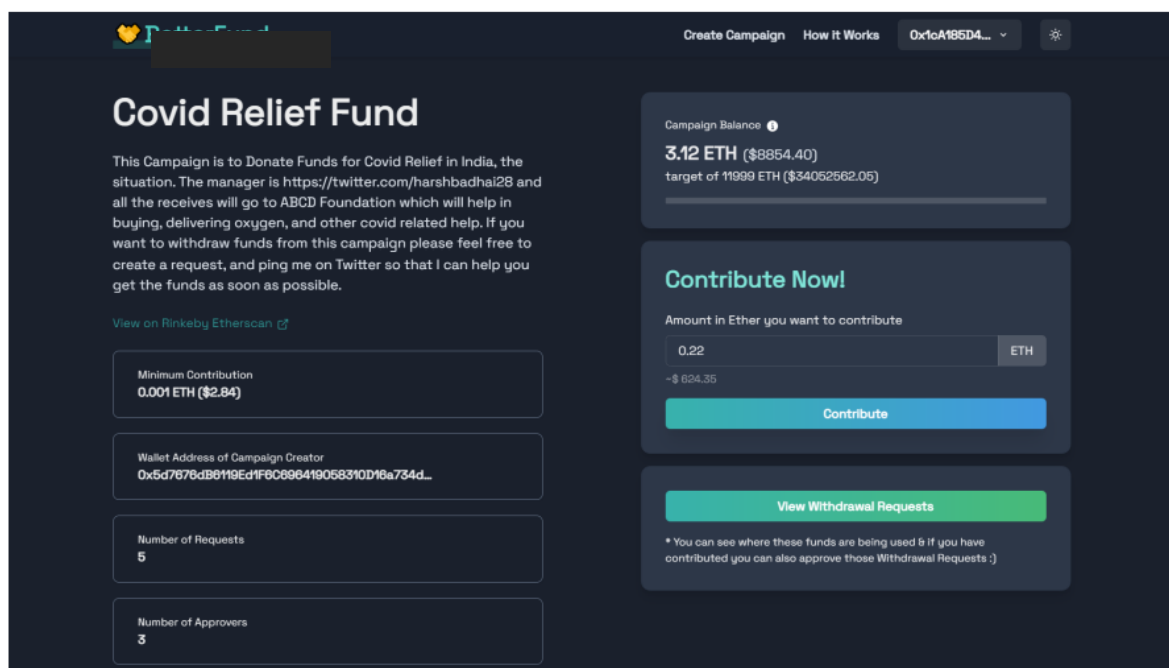
Just like Crowdfunding in the real world as well as on other crowdfunding platforms, anyone can create a campaign in a few minutes. The campaign information will be managed by the Ethereum-based smart contract and thus cannot be tampered with.



The screenshot shows a dark-themed form titled "Create a New Campaign" with a megaphone icon. The form contains several input fields: "Minimum Contribution Amount" with an "ETH" button, "Campaign Name", "Campaign Description" (a larger text area), "Image URL", and "Target Amount" with an "ETH" button. A teal "Create" button is at the bottom.

2. Contributing to a Campaign:

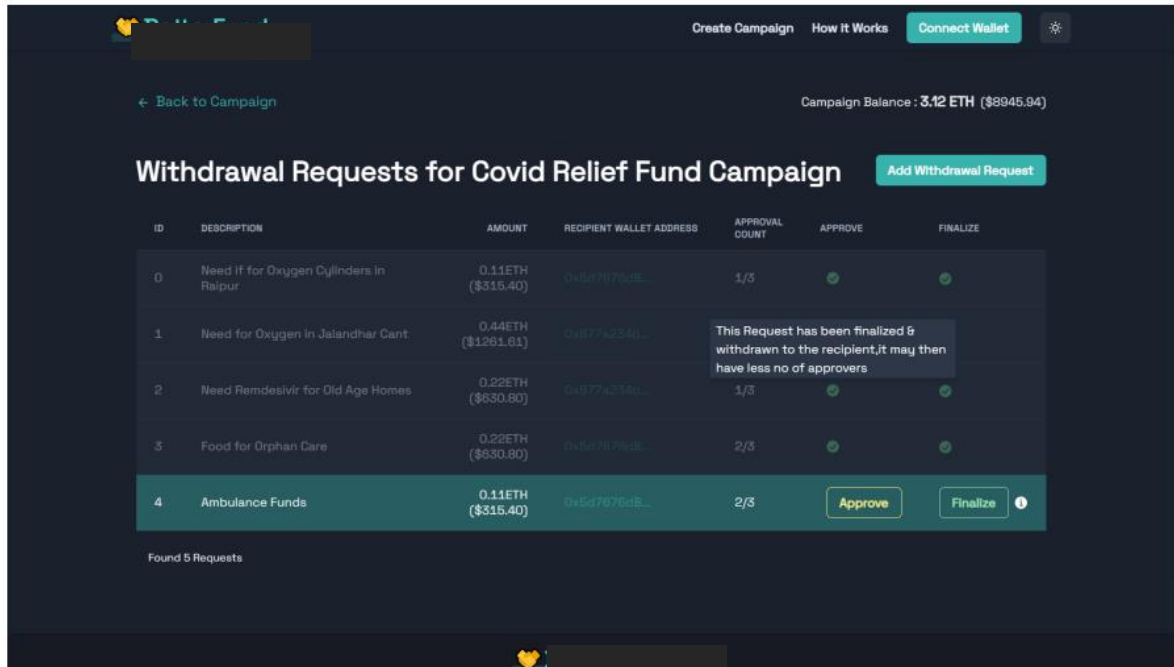
Once a campaign has been created, users can share the campaign and anybody can contribute to the campaign. The funds will go to the address of the campaign and not to the creator of the campaign, thus making the process more efficient and anti-fraudulent.



The screenshot shows a campaign page for "Covid Relief Fund". The header includes a logo, a navigation bar with "Create Campaign", "How It Works", and a wallet address "0x1cA185D4...". The main content area on the left describes the campaign: "This Campaign is to Donate Funds for Covid Relief in India, the situation. The manager is https://twitter.com/harshbadhal28 and all the receives will go to ABCD Foundation which will help in buying, delivering oxygen, and other covid related help. If you want to withdraw funds from this campaign please feel free to create a request, and ping me on Twitter so that I can help you get the funds as soon as possible." Below this is a link "View on Rinkeby Etherscan". A summary box on the left shows: "Minimum Contribution 0.001 ETH (\$2.84)", "Wallet Address of Campaign Creator 0x5d7676dB9119Ed1F6C898419058310D16a734d...", "Number of Requests 5", and "Number of Approvers 3". On the right, a "Campaign Balance" box shows "3.12 ETH (\$8854.40)" and "target of 11999 ETH (\$34052562.05)". Below this is a "Contribute Now!" section with an input field for "Amount in Ether you want to contribute" (0.22) and a "Contribute" button. At the bottom right is a "View Withdrawal Requests" button and a note: "* You can see where these funds are being used & if you have contributed you can also approve those Withdrawal Requests :)".

3. Withdrawal of Funds:

The Creator of a Campaign can propose how to use the funds in the form of a Withdrawal Request. Anybody who contributes more than a particular amount is called an approver, and will be able to approve or deny the request. Funds can't be withdrawn without the approval of 50% approvers.



3.3 Performance Requirements

None identified.

3.4 Logical Database Requirements

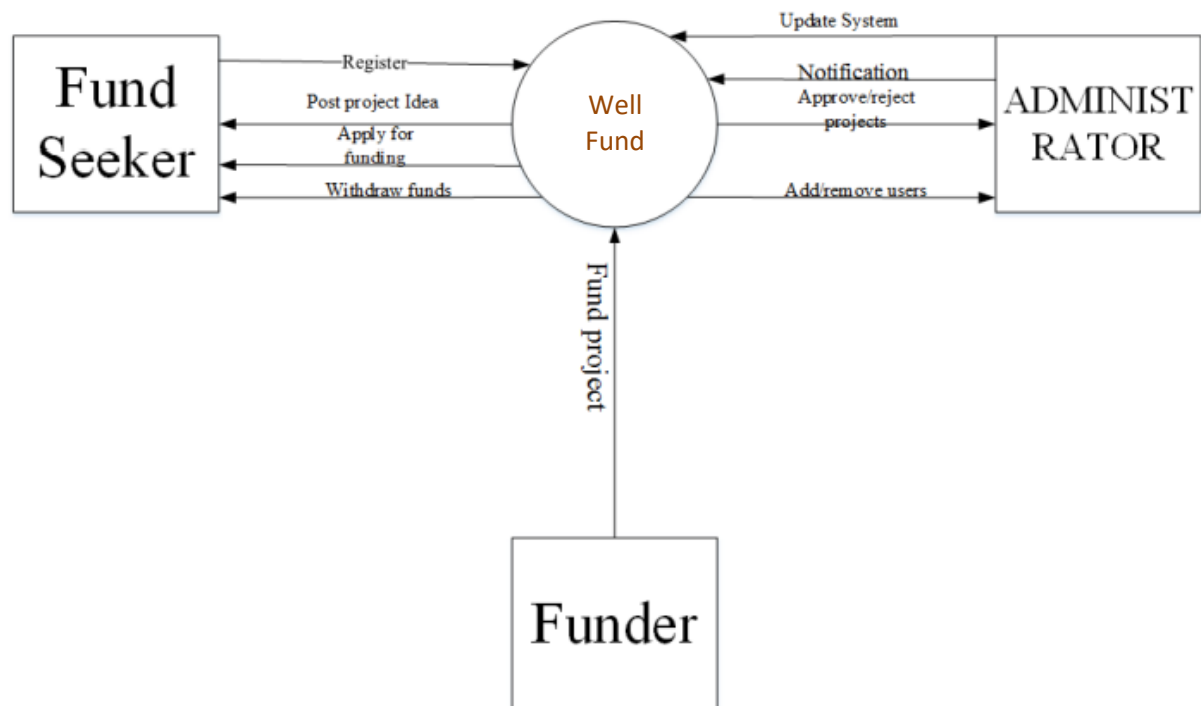
None Identified

3.5 Design Constraints

None Identified

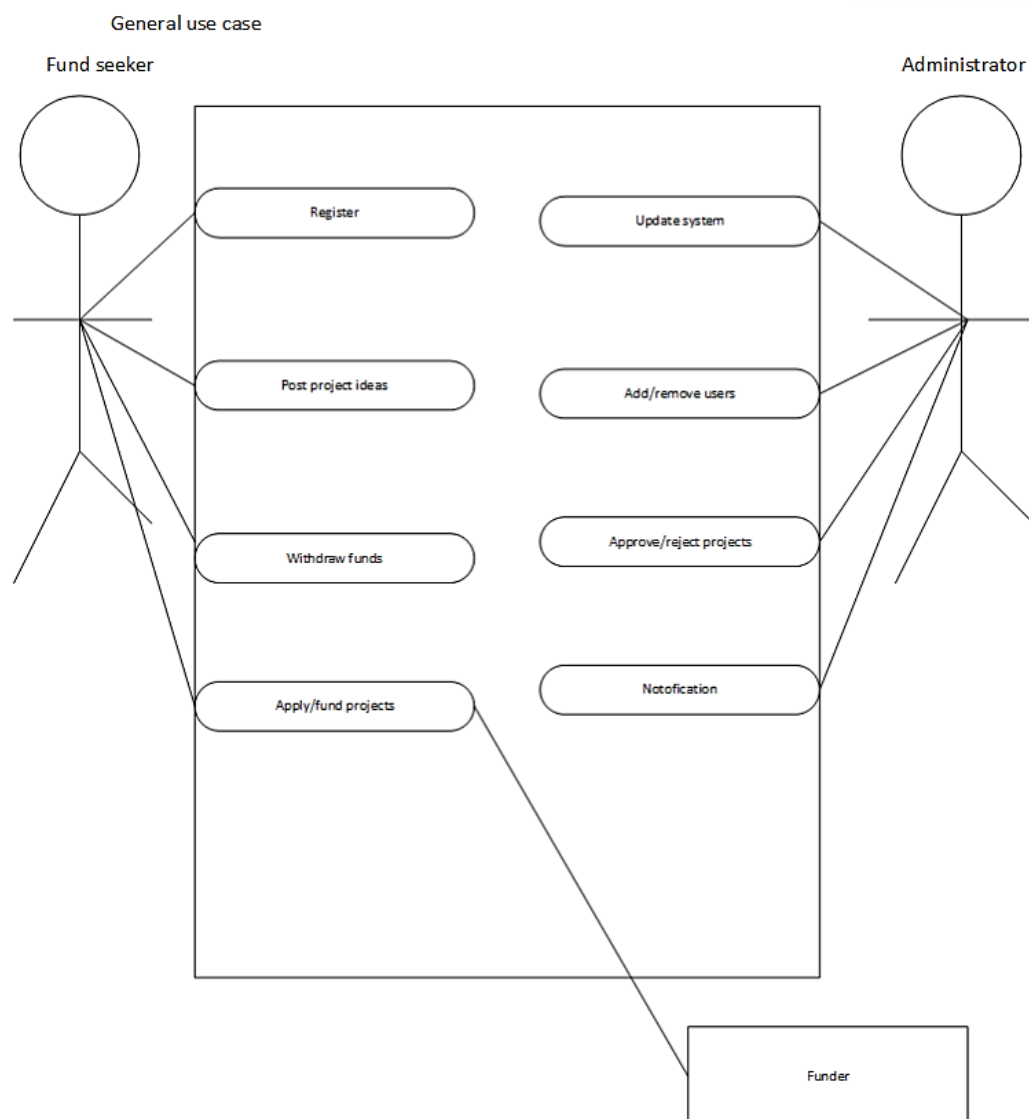
3.6 Standards Compliance(diagrams)

Context Level Diagram



User Case Diagram

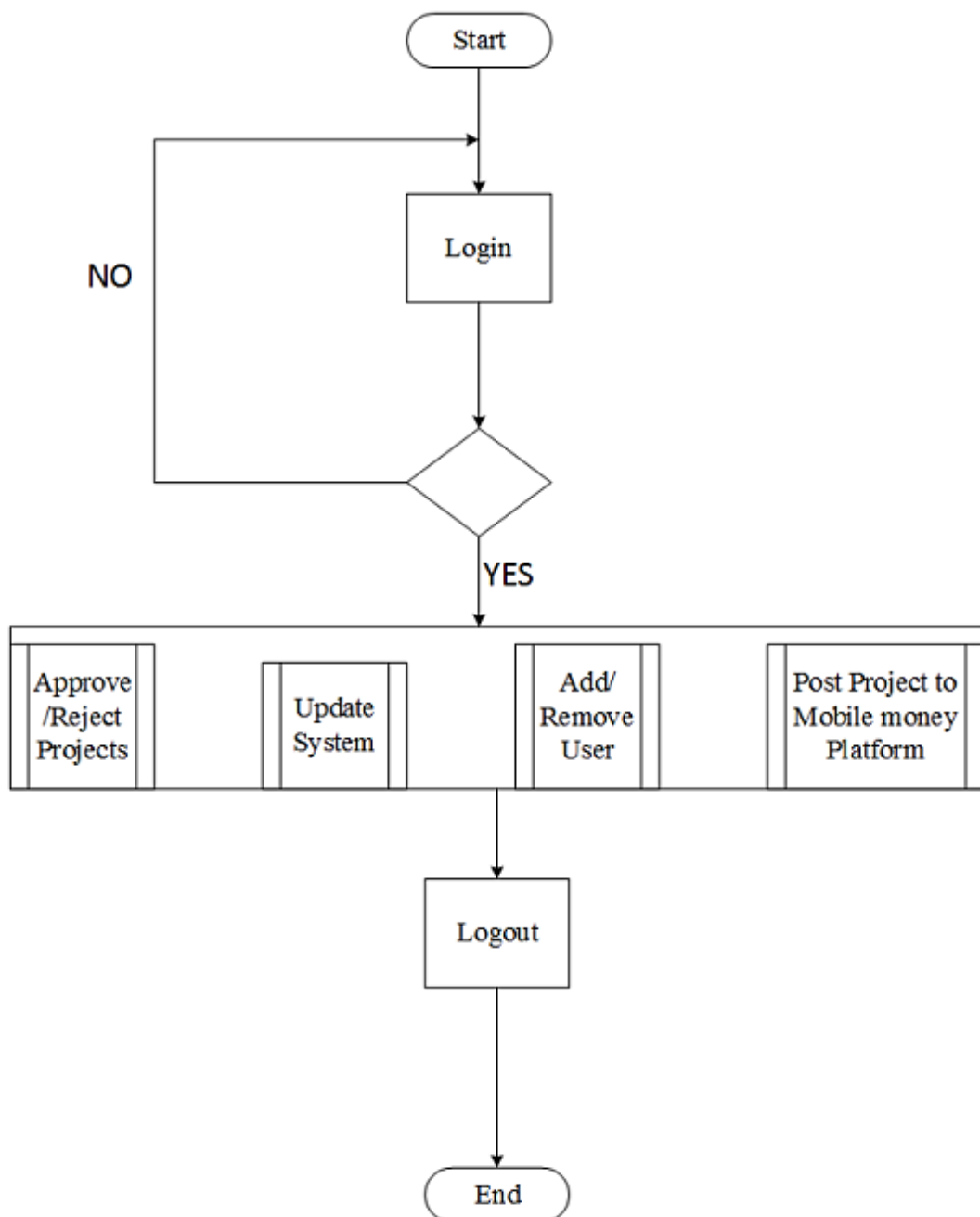
A use case diagram is a diagram that shows a set of use cases and actors and relationships. Figure below shows general use case diagram illustrating fund seeker, administrator and funders relationships.



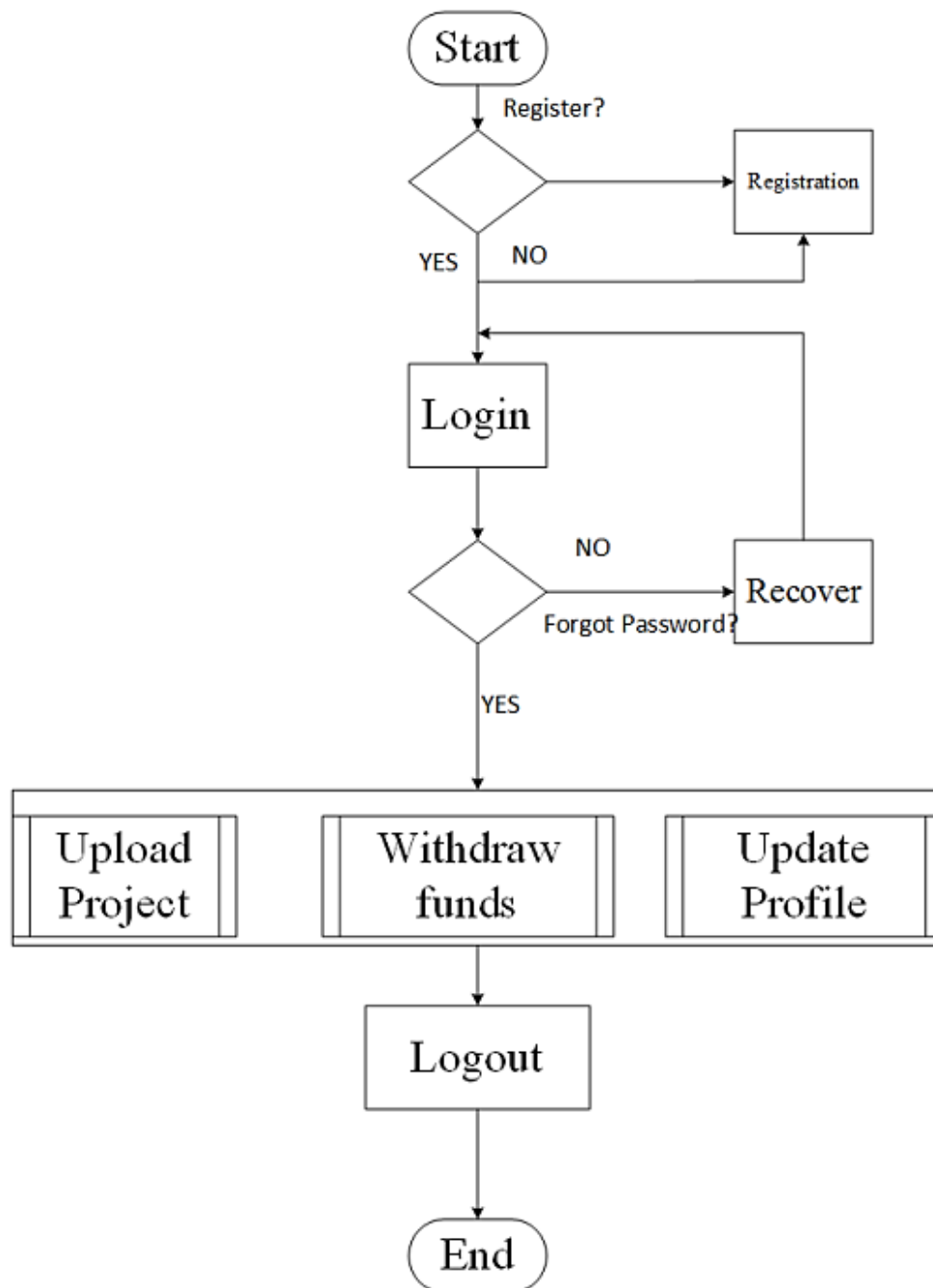
Process Flow Diagram

Activity Diagrams: An activity diagram shows the flow from activity to activity. Figure below is the diagram showing the information flow of administrator.

1. Administrator Process



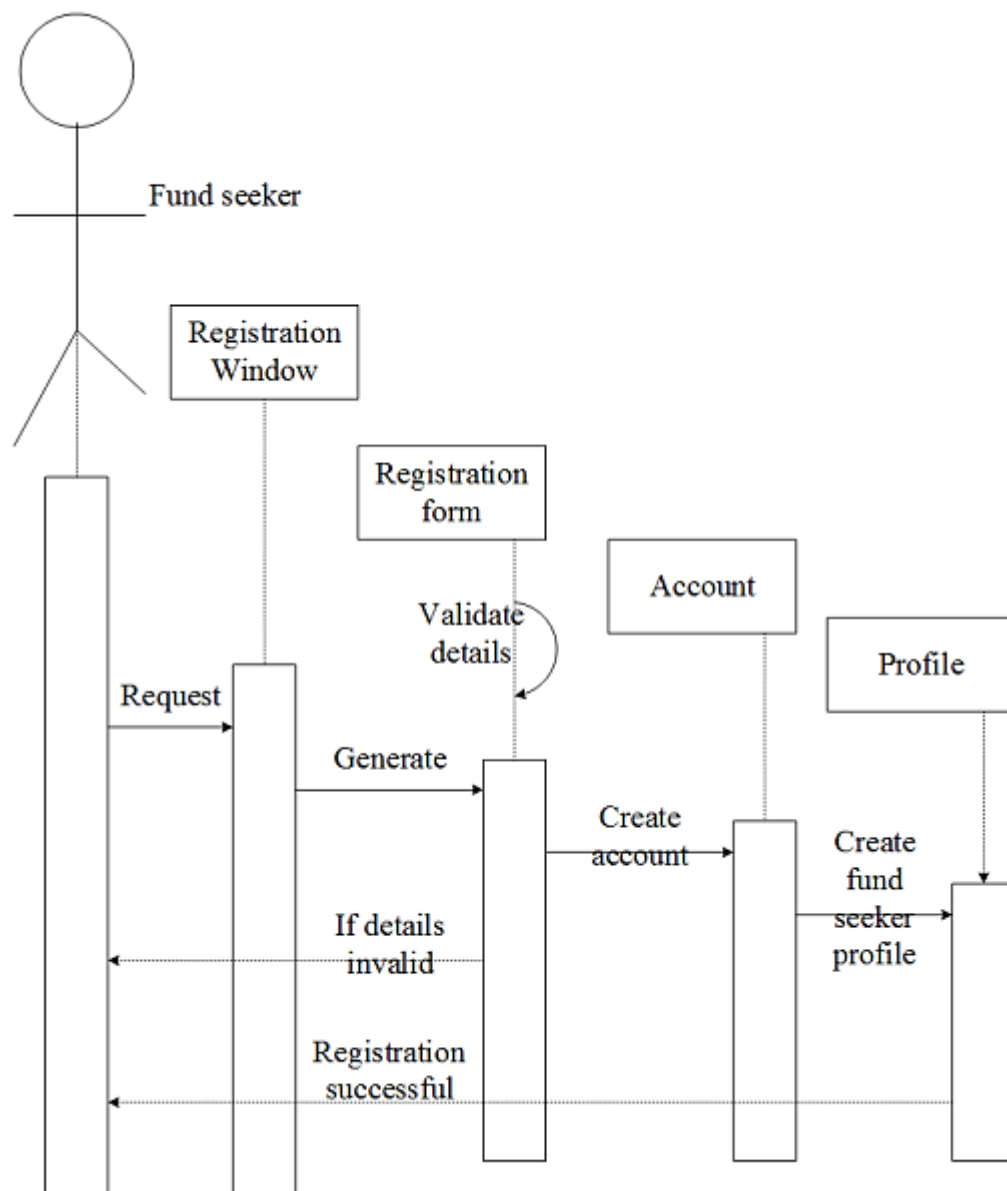
2. Fund Seeker Process



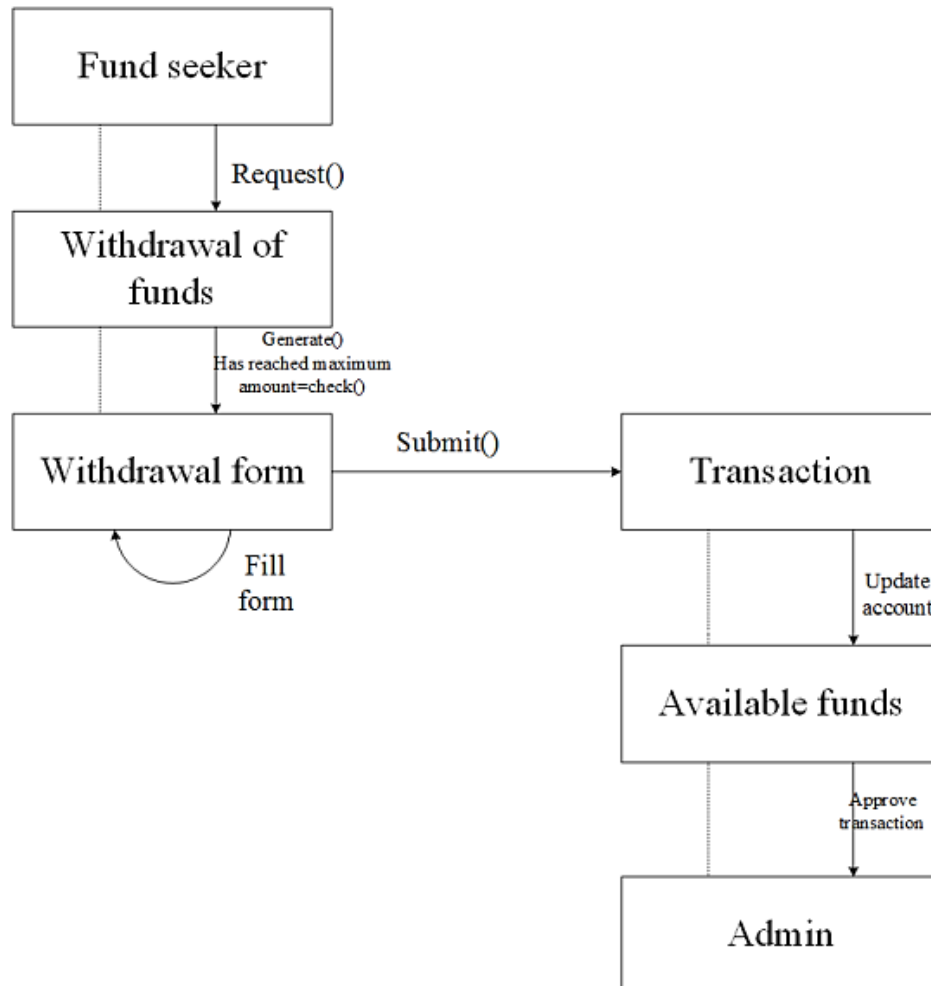
Sequence Diagram

A sequence diagram is an interaction diagram that emphasizes the time ordering of messages. Graphically, a sequence diagram is a table that shows objects arranged along x-axis and messages, ordered in increasing time, along the y-axis.

1. Fund Seeker Sequence



2. Transaction Sequence



3.7 Software and Hardware Requirements

- **Software Platform**

- a) **Front-end**

- NextJS: Next.js is an open-source React front-end development web framework that enables functionality such as server-side rendering and generating static websites for React based web applications.

- b) **Back-end**

- Solidity: It is the programming language for implementing Ethereum based Smart Contracts.
 - Web3: web3.js is a collection of libraries that allow you to interact with a local or remote Ethereum node using HTTP, IPC or WebSocket.
 - Ethereum Smart Contract: It is the collection of functions and data that reside at a specific address on the Ethereum Blockchain.

- **Hardware Platform**

- AMD Ryzen™ 5 3500U with Radeon™ Vega 8 Graphics
 - Windows 10 Home Single Language 64
 - 12 GB DDR4-2400 SDRAM (1 x 8 GB + 1 x 4 GB)
 - 256 GB PCIe® NVMe™ M.2 SSD
 - AMD Radeon™ Vega 8 Graphics

- **Tools**

- Solidity
 - Remix IDE
 - Visual studio code
 - Metamask
 - Testnet