International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 08 | Aug 2022 www.irjet.net p-ISSN: 2395-0072

Android Application For Decentralized Family Locator

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Abstract - Android Application for Decentralized Family Locator is a application that would eliminate the need for a central server and allow family members to see the whereabouts of other family members in real-time. Families with members who frequently travel or who reside in several locations throughout the world might find this to be extremely helpful. The programme would locate each family member using the GPS capabilities of their phone and would automatically update the position data. Family members would be able to communicate with one another by sending messages and viewing each other's locations on a map. This decentralized Application promises the highest levels of data protection, and accuracy .Despite the fact that numerous program with a similar function are available, they are all under the jurisdiction of one single entity, which has complete control over all data.

The security of user data is undermined or compromised if the central authority fails, and there is a possibility that data will be wiped. This decentralized Application makes use of blockchain technology in the backend to overcome this problem. Blockchain is a distributed ledger with several benefits over a centralized organization. Blockchain guarantees that data is easily accessible across numerous nodes, that data is tamper proof and user have control over the application.

***Key Words*: GPS, Decentralized Application, Blockchain, Android Application.**

1. INTRODUCTION

People nowadays expect information about the where abouts of anything for tracking purposes, thanks to recent technical advancements in modern science. We currently desire additional location-based services in order to be more advanced and to save time and money. GPS is a technology that is already in place and that anyone can use without restriction.

Having the ability to use GPS to construct this system, we will require a GPS device to compute the location using GPS data.

As a result, we chose an Android device to make these computations because it is inexpensive and provides a variety of functions, including GPS service. As a result, this system was created to track a person's whereabouts using block chain technology, which offers greater benefits and security. The current family locator app is centralized, which means that users have little control over their own personal information. It is also less secure because if the app is hacked, all of the data is lost, whereas this is not the case with a decentralized app because it is distributed across a network. Additionally, it allows people more control over their personal data. The presented decentralized networking is based on open-source technologies. A Decentralized Application (dApp) is a programme or application that runs on the block chain network. A dApp GPS Tracker is a sort of decentralized application that tracks the user's location. The primary goal of this project is to create a safe location tracking system for friends and family members.

2. Existing System

Currently available Android family locator apps only focus on using GPS to track the location of a family member and then sharing that information with the rest of the family. This can be done in real time or by tracking the whereabouts over time and then informing the family. It also has a security disadvantage.

Disadvantages:

• It is challenging for the other family members to locate a lost family member.

• The app's potential to drain your phone's battery is another drawback. To continuously track the where abouts of family members, the software consumes a lot of battery life.

•Individuals may easily have their personal information taken and face numerous privacy difficulties.

3. Proposed System

We are developing a decentralized family location app for Android to address current issues. For starters, because the programme is decentralized, it is much more difficult for someone to get into the system and track users' locations without their consent. Second, because the programme is decentralized, it does not rely on a single server, reducing the likelihood of downtime. There are numerous centralized families locating apps accessible, but a new generation of apps is starting to emerge that use decentralized technologies. This means that the app stores and manages data across a network of dispersed servers rather than a single server. This provides a number of benefits, including improved security and privacy as well as increased resilience in the case of server outage.

Advantages:

• We implement the Block chain concept in the Android application for the

decentralized social network to protect user privacy.

• Decentralized app is more scalable and resilient.

4. System Design

System design is the process of creating a system, typically a computer system, in compliance with a set of requirements. The system design process moves on to the requirements specification step once the feasibility research is finished. The requirements for the system are precisely established in this phase. The aim of the design method is to provide a model or image of a system that might be used to construct that system later. The title of this version is "gadget layout." It is a plan for fixing the system's issues. The device layout is the most creative and challenging phase in the gadget development life cycle.

4.1 Context Diagram

An overview of a system called a context diagram displays the boundaries of the system as well as interactions between the system and its surroundings. Context diagrams are helpful for comprehending a system's large picture as well as for recognizing the key components and connections between them.

As may be seen below, the Context Diagram suggests delivering a stage 1 DFD by treating the entire machine as a single system.

Fig 4.1 context diagram

4.2 Architectural Design

The design and construction of buildings is the practice of architecture. It is a procedure that entails the preparation of a blueprint or plan that will later be utilized to direct the building's construction. The architect is in charge of the building's general style, as well as its use and intent.

A decentralized family location app can easily be created since each user might be portrayed as an actor. The initial step of the process is for the user to sign up and create an account within the programme. The server will produce a special code after you enter so you can join the circle. The user can join the circle after confirming, however to use the software, they must have their location turned on.

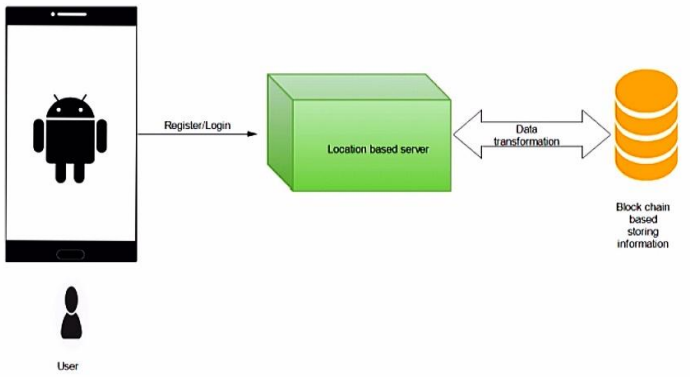

Fig 4.2 Architectural Design

5. Detailed Design

It is often a human or a computer, and as such, it requires an entity that is pertinent to the features of the device with which it is interacting. Actors and use cases are both identified after which the relationship between them is established. It records each time an actor engages with the system.

5.1 Use Case Diagram

In the Unified Modeling Language (UML), a use case diagram is a form of behavior diagram that illustrates how users (or actors) interact with the system (or use cases). Its goal is to illustrate graphically the interactions between actors, goals (represented as use instances), and any dependencies those use instances may have. The use case graphic's main goal is to demonstrate. The system's rules' actors will be portrayed. Actor interaction is not shown in the use case graphic. The boundaries of the gadget or use case may need to be reevaluated if this interaction is necessary for a comprehensive explanation of the needed behavior.

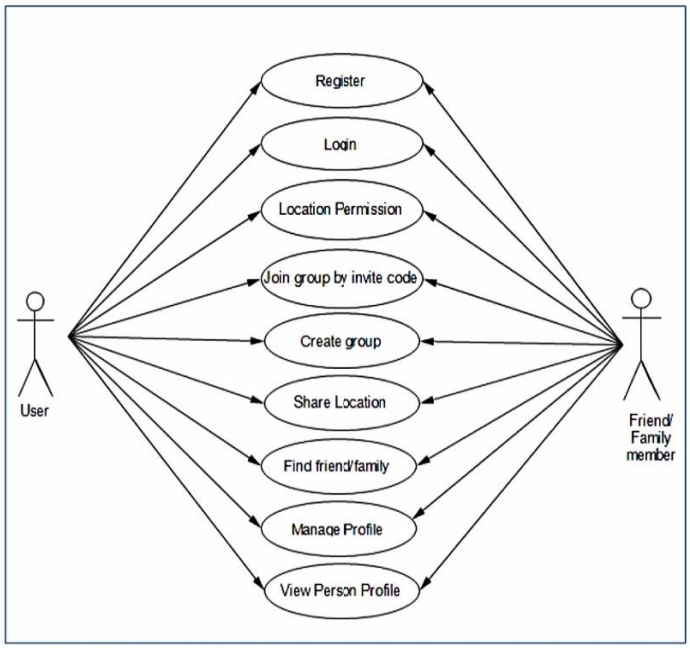

Fig 5.1: Use Case Diagram

5.2 Activity Diagram

A process or workflow is graphically represented in an activity diagram. It is frequently used to simulate the movement of events inside a system or organization. Both straightforward and complex processes can be modelled using activity diagrams. For modelling and describing processes, activity diagrams are an invaluable tool. They can be used to locate possible stumbling blocks and inefficiencies as well as to enhance process comprehension. It may also be used to show how a collection of use cases works together to depict corporate workflows. An event is typically carried out by several operations, especially when the operation is intended to accomplish some of the many tasks that require coordination. instances where sports are involved, for instance.

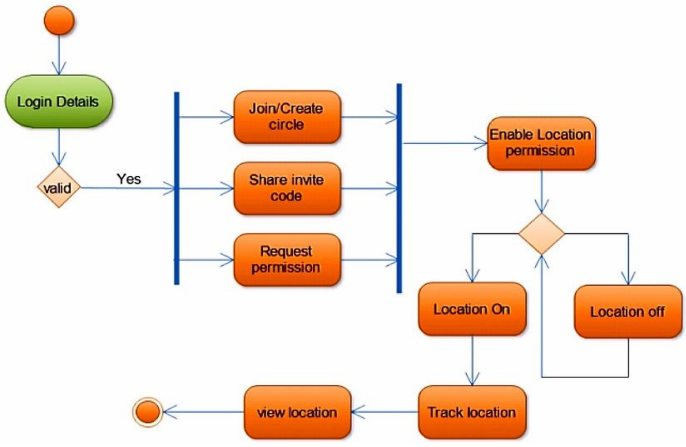

Fig 5.2 Activity Diagram

6. System Testing

System testing is the process of confirming a complete, integrated system's functionality to make sure it complies with predetermined requirements. Frequently, system testing is carried out as a "black-box test," which means that test cases are created based on external specifications without knowledge of the underlying workings of the system.

Additionally, testing is the act of executing a programme with the explicit intention of locating and fixing mistakes as well as verifying the operation of the programme.

6.1 Unit Testing

The best approach to make sure your code is functioning as expected is to run it through unit tests. Individual bits of code can be tested to ensure they function as intended by writing unit tests. When you are working with previously written code or when you are making modifications to existing code, unit tests are extremely crucial.

6.2 Integration Testing

The functionality of an application when it is integrated with other apps is tested through the use of a sort of testing called integration testing. The entire system is tested using a type of black-box testing. Commonly, system testing comes first, followed by integration testing.

6.3 System Testing

There are many ways to characterize system testing, but the simplest definition is that validation is successful when the system operates as the user could reasonably expect it to. The system's practical, behavioral, and overall performance criteria are all verified through validation testing.

6.4 Black Box Testing

A method of testing software known as "black box" does not involve any knowledge of how the software being tested operates internally. Any sort of software, including apps, websites, and computer systems, can be tested using black box testing.

6.5 White Box Testing

White box testing is a sort of testing where the test creator is fully aware of the internal workings of the software being tested. This enables them to develop tests that are explicitly targeted at exercising the code rather than just checking the operation of the product from a distance. By using the machine's internal perspective, white container testing creates test cases that are based on the internal organization of the machine.

Sl.NO	Scenario	Action	Expected result	Actual result	Status
1	Enter email-id	User must enter their valid email-id	The application will navigate to next page	As accepted	Ok
2	Enter password	User enter correct password	It allows user to logged into the page	As accepted	Ok
3	Create/join group	User may create group or join existing group	It adds members to the group	As accepted	Ok
4	Invite code	User can share their code to another person	This will help user to join circle	As accepted	Ok
5	Allow location permission	User must enable their location permission	It helps to access the application in better way	As accepted	Ok
6	Home page	It will display the user current location	This will allow user to scroll feeds	As accepted	Ok
7	message	Click on group to chat	It allows to send/receive message	As accepted	Ok
8	Share location	It shares their location all the time	User can also disclose their location	As accepted	Ok
9	View location	Click on circle or particular person profile	This will allow user to view location of another person	As accepted	Ok
10	Safety	Click on safety button	This helps user to protect themselves in case of emergency	As accepted	Ok
11	Remove member	Click on the group/ circle	In this user can delete any member from the circle	As accepted	Ok
12	Profile	Click on profile setting	User can update/ edit their profile	As accepted	Ok
13	Setting	Click on setting	This allow user to make changes in their account	As accepted	Ok
14	Privacy	Click on privacy	Here we can block account , and make private or public account	As accepted	Ok
15	About	By click on about	User can view the data policy on this page	As accepted	Ok
16	Logout	By click on logout	User can end up their session	As accepted	Ok

Table 6 :Test Cases

CONCLUSION

An excellent approach to keep track of family members, especially if they are dispersed across many regions, would be through a decentralized family locator app. Without relying on a centralized server, this kind of tool would let users know where other family members are in real-time.

As a result, it would be more challenging to follow a family's movements and households would have more privacy control. These websites allow a sizable number of internet users to keep in touch, exchange messages, and also share their actual location. In an emergency, this software will also assist parents in securing the safety of their kids. Users can take back control of their ownership and privacy with the help of decentralized applications.

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