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Flare – A Community-Based SOS Application

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ABSTRACT

This paper presents a mobile based application that will enable to solve numerous problems with a simple solution. The project - ' Flare ' focuses on creating a community based application wherein the community helps and grows together. The application is called Flare , keeping in mind the actual flare gun that is used by like sailors or like army-men in times of need and they launch an actual flare. Similarly any user can launch a flare – a call for help.

Keywords: flare, mobile application, SOS

1. INTRODUCTION

This paper focuses on a novel idea for not one problem but for a bunch of problems. Humans have been asking for help since forever. The main problem statement involves the fact that any registered user on the application can send out an SOS for any type of help or emergency or just a task that they are unable to perform. A simple implementation of this at the ground level involves you asking a friend for some help, but here we focus to replace that friend by the entire community of registered users. Keeping the current scenario of Coronavirus in mind, an application like this is one of the most important things to have when reliance on essential services is maximized but those services aren't available, hence you and the community help each other out in times of need. Flare is an application that connects high-risk individuals who need help during the crisis with low-risk people looking to help. It allows users the opportunity to request help with various issues ranging from grocery delivery to mental health support.

To facilitate interactions, the app will map out people based on their estimated location and the moment when they requested help. It will also allow users to thank volunteers so they can accumulate these thanks. It will provide a simple chat interface in order to communicate effectively and provide the means to allow users to take that communication on a separate channel, fulfilling our main objective to link people who need help with those who are willing to help.

2. PROBLEM STATEMENT

Creating a community-based SOS application that helps each and every user with a varied category of emergencies and situations. For example: it could be a situation wherein you are stuck in a place as your car broke down or tyre gets defected and you send a "flare" of help, it could be a quarantined person in need of getting some parcel or groceries and they send a "flare" of help, and so on. Hence the problems are many , the solution is simple, send a "flare", the community of users respond, get the help you need

3. MOTIVATION

The most basic form of motivation for this project is the current crisis, with this pandemic in motion is the need for help. People depending on each, even though there is an evident lack of social interaction. The actual motivation is from the logic of flares that are used by sailors on boats, when they in a troubled scenario, they let out a flare as a cry for help or an SOS , and nearby agencies arrive for help. Similarly, any user lets out a Flare, and they can get help from nearest available volunteer. Politically, this project offends no agendas as its good for the community and it creates a perfect community where people can rely on each other. As per the environmental aspect of this project,

there is no need for any worries as this project is solely an application that would do no harm in any way to the environment. The only difficulties that this app can feature is the evident issue of misinterpretation of flares in the social scenario, which could lead to creation of a situation of trouble or danger.

4. LITERATURE SURVEY

[1] This paper focuses on the creation of a disaster management system during events of catastrophic disaster. The main premise of this application to help locate and search for victims in a disaster hit area. The idea is backed by the usage of something as “rescuers” &“propagators”, or in simpler terms receiver and sender of SOS message The proposed ideology works on the simple premise of Bluetooth connectivity wherein so called mobile victims or rescuers send pairing requests throughout the entirety of the area, and immobile victims wait for them. The drawback of this method is that Bluetooth radius is very limited thereby making it really difficult to act as a disaster system given that in a state of disaster enabling Bluetooth on your device will not be your first priority. [2] This paper presents a study on existing frameworks of Emergency Reporting applications available on Google Play Store or the App Store. The study aims to find a common ground as to how these apps create an interface of communication between request-maker &responder. This study indicates that there is huge scope of EMS – emergency management system applications. It gives a detailed comprehensive study involving all the existing apps on the said app stores but also says that there is no perfect amalgamation of features present thereby allowing for a lot of scope for future development. It also emphasizes the existence of more health centric applications, which indicates a lack of creativity in other sectors hence leaving scope on innovation. [3] This paper brings into our perspective an actual implemented idea of an application used by Serbian Police for detecting situations of emergency or those that require immediate response. The core idea is to use a geolocation service and then act accordingly by going on the received latitude and longitude coordinates and assessing the situation. This application has actually done a release testing which showed a minimum response time starting from the transmission all the way upto the the authorities acting on it in a minimum time of 1 minute and a maximum time of 3 minutes. The drawbacks of the proposed method is location accuracy, since GPS can’t be accurate in certain places and in apartments. The other drawback is the fake calls received. This application doesn’t have any way to actually authenticate the reality of the situation until it is assessed, thereby leading a huge scope of being catfished. [4] This research project is a SOS application solely focused on safety of woman. The core agenda is to create an application that women can rely on to get out of uncomfortable or seemingly threatening situations. The conclusion for this paper is a rather trivial one , although it works as intended in a real life scenario, this application fails as in modern times this feature of doing an emergency SOS call is already integrated in newer versions of android and ios thereby making it a little redundant. [5] This research application proposes a very basic application that is like the sole base of any SOS based application i.e. click on a button message is sent. The app only works on older operating systems and is now replaced by inbuild SOS technology by evolved operating systems thereby rendering it to a state of redundancy. [6] This is the first research paper in this survey that focuses on creating a unified platform i.e. a mobile as well as a web based application. The application targets situations of emergency such as ambulance,fire trucks &police. This is the first glimpse of slightly community-based application as more amount of requests from a certain area to a command centre validate that requests authenticity. The paper leads to a nice inference as its the first paper that highlights the importance of community in sos requests and looks at a broader scenario. The only drawback is that the technical stack used especially PhoneGap reduces the future of the application as it prohibits stability and scalability due to no future development of the framework. [7] This research proposes an ENS – emergency notification system. More than an SOS system its an emergency database recorder. This paper focuses its efforts on creation of different types of emergencies such as terrorist incidents and just asks its users to update the status. This application works well for the given use case. The only drawback would be the presence of emergency notifier at the very instant rather than acting as a reporter of emergencies.

5. PROPOSED METHODOLOGY

5.1 Overview

Flare is an application that connects high-risk individuals who need help during the crisis with low-risk people looking to help. It allows users the opportunity to request help with various issues ranging from grocery delivery to mental health support. To facilitate interactions, the app will map out people based on their estimated location and the moment when they requested help. It will also allow users to thank volunteers so they can accumulate these thanks. It will provide a simple interface in order to communicate effectively and provide the means to allow users to take that communication on a separate channel, fulfilling our main objective to link people who need help with

those who are willing to help. The main 3 features around which the entirety revolves is:

- Creating a Flare: After a user has created their account, they will have the option to create a new flare. This flare will need a title and a detailed description of what they need from the volunteer.
- Volunteering for a Flare: After a volunteer has created their account, they will have the option to help users in need. They will see all flares in reverse chronological order, only in the range of distance previously selected by the volunteer.
- A reward system that helps and promotes for users to assist in more Flares as this would lead to better helping since we will be giving users an incentive to help. This rewards system could be tied up with other applications and could lead to a greater good and also increase customer base.

6. SOFTWARE REQUIREMENTS

6.1 Functional Requirements

1. Requesting Help

This feature allows users to request help by category, using their location to allow helpers to easily find these Flares. The process will entail writing a title and details for the Flare, so helpers can have all the information they need before accepting.

Key features/usecases

- As a user I want to create a simple account so I can get to adding my flares.
- As a user I want someone to talk to me and ease my loneliness during this time.
- As a user I want to be able to get some groceries without having to leave my house.
- As a user I want to be able to easily write what I need help with in the app, though a simple user interface.
- As a user I want to submit a flare and have a user who is able to assist quickly respond to me so we can begin chatting.
- As a user I want to be able to see the profiles of the people who are helping me.
- As a user I want to be able to communicate with whoever is going to be helping me via chat or a call.

2. Offering Help

This feature allows people to offer help, and take on a flare that has been opened in their selected area. They will have the option to mark the flare as completed. .

Key features/usecases

- As a volunteer I want to help the high risk individuals in my surrounding areas or neighborhood.
- As a volunteer I would want to see the most relevant flares by distance and reverse chronological order, so that I can find them easily.
- As a volunteer I want to select the type of notifications I will receive from the app, whether it's with every new flare, daily or weekly.
- As a volunteer I want to only see the flares which are in the distance I previously selected, so I only see the flares I can actually assist with.
- As a volunteer I would want to navigate to a flare and see the details of the need, so I can easily determine if I can assist.
- As a volunteer I want to be able to see the profiles of the people who need my help, to generate rapport between us.
- As a volunteer I want to be able to communicate with whoever I am going to help, via chat or a call.
- As a volunteer I want to be able to feel good about helping my fellow neighbors, being thanked by them through the app.
- As a volunteer I want to be able to see if a user I previously helped has any new specific needs or flares.
- As a volunteer I want my address and phone number to be hidden from other users/volunteers.

3. Login & Profile

Each user and volunteer will create a profile within the app with the following information:

- Full Name
- Nickname
- Profile Picture
- Address (Only the Postal Code will be visible, with an estimate of the user's geographical area)
- Social Media link for verification

The user/volunteer profile will also include:

- Number of 'Thank You' received
- Number of Flares created / managed
- Open Flares

4. Chat & Communication

After a Flare is created by a user and accepted by a volunteer, they will be linked in a conversation. They can share personal information to complete the flare and at any point they can end the chat or block their counterpart.

5. Notifications

After a Flare is created by a user , an FCM notification shall be initiated to the users that accepts to help

6.2 Non Functional Requirements:

1. Performance
2. Scalability
3. Responsiveness
4. Use-ability
5. reliability
6. Security
7. Documentation

7. IMPLEMENTATION

7.1 Technical Stack

- **Mobile App**

The mobile app will be developed using the framework Flutter. Behind the scenes, it uses the Dart programming language which is performant and relatively simple to use.

Flutter's greatest benefit is that it allows for cross-platform development for both Android and iOS whilst also not being limited by the JavaScript Bridge that is a bottleneck in framework such as React Native. Flutter works by directly drawing onto an OpenGL layer which results in performant applications on both platforms since no code has to be compiled from JavaScript to the native layer at runtime.

Flutter suffers from common problems that new frameworks face (lack of adoption, changing APIs) but is receiving large scale investment and support from Google as well as expansion to other platforms, most notably a browser based implementation.

Internally the application will use a MVC pattern and GetX to allow for easy testability and extensibility.

- **Backend**

The backend will be supported entirely by Firebase Cloud Firebase and Firebase Cloud Functions. This low effort server solution has allowed us to prototype swiftly and with very minimal server code. Off the shelf Firebase lets us support user accounts, commercial level security, automatic database and server scaling and first class support for mobile applications. The application also uses GCP console to integrate with Google Maps AI and geolocator to show flares and fetch user location and flare location and display it on a map..

7.2 Architecture of the App

The app architecture is vividly shown in the Figure 1, it shows a simple flow of data/screens from user authentication to login and sign up using different methods.

Then it leads to a simple profile creation, which on completion would lead you to a Home, that would contain the home page , profile page, existing flare, creation of flare and all flares on a map.

The design pattern used for this app is called MVC - Model View Controller and we are able to achieve this using the GetX state management package.

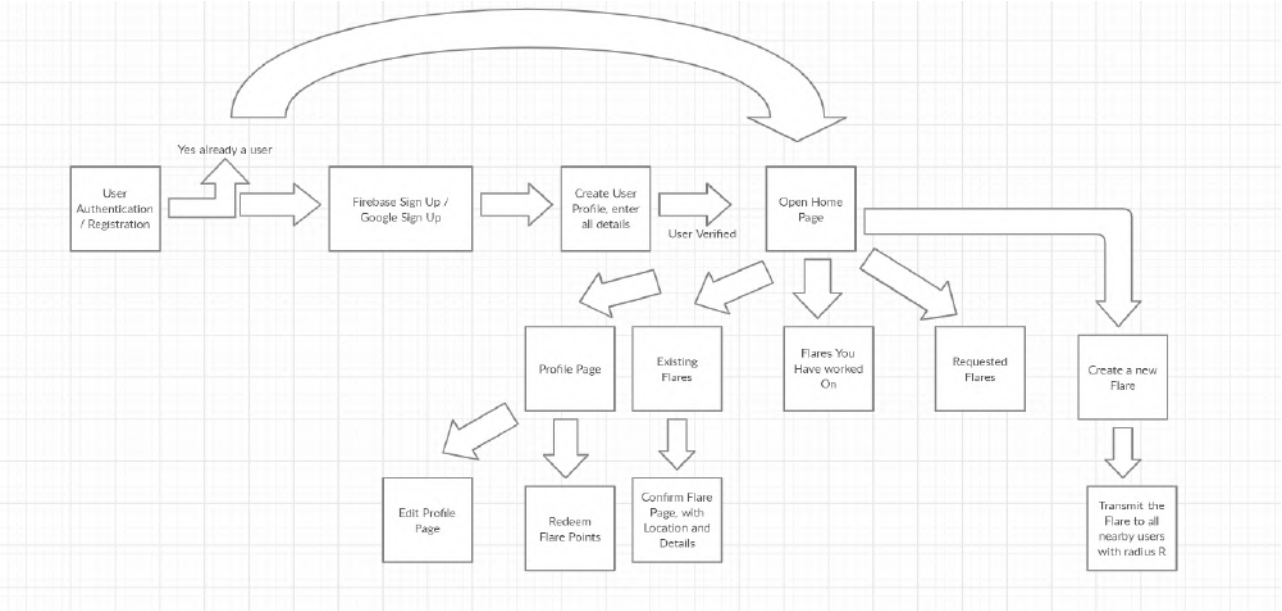

Fig 1: App Architecture

8. CONCLUSION AND FUTURE SCOPE

In conclusion this paper presents a novel solution that not only acts a community provider and promoter but also helps for mutual growth. The prototype application acts a perfect start point for the idea , it
helps in ways that are never imagined before . It helps in simple daily tasks but also deals with bigger issues such as depression or loneliness. This paper has a lot of future scope with better flare detection, better area clarification, better community building algorithms . This paper can be turned into a proper business model by tying up this application with other apps acting as reward scenario thereby allowing for greater promotion and incentive but that would require more companies on board. The application is already built on flutter thereby giving both ios and android compatibility, other improvements could be UI based changes, making the google maps more interactive.

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