Trinity College

Robin Food

Computer Science Senior Project Proposal

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Abstract

India has the most people in the world living below the poverty line.[1] There are poor people living on the road, begging for money, water or food. Sometimes, they go for days without being able to afford a single meal.[2] On the other hand, restaurants and even households waste a lot of food. Existing solutions do not take into consideration that a percentage of the population of the world cannot afford a meal a day, let alone a smartphone and an active internet connection. Also, existing solutions do not make it easy or convenient for volunteers with busy schedules.

This senior project aims to help those who struggle to eat regularly and healthily as a result of poverty. This project will consist of an app which connects restaurants, households, parties and other social gatherings to volunteers (either individual or part of NGOs). People, companies or organizations which have excess food or wastage of food, can inform volunteers of their location and amount of food. Volunteers will then go pick up and distribute the food by foot, bike, or car depending on what is most convenient. This app encourages people to have the will to donate food on their fingertips. Finding the needy will not be an issue, as every small area has poor people sleeping on the road. The poor will thus now have access to meal without owning a smartphone. Donors want to help the poor, but do not always have the time or means to do so. This encourages people so donate food instead of throwing it away, and it helps one more human being to have a meal in a day (sometimes, days).

Background

Food is a necessity in life, and unfortunately, hundreds of millions of people in India cannot afford even a single meal every two days, whereas, more financially stable individuals and families waste food daily.[2] This project is real-time information distribution to best match volunteers who are wanting to help reduce the hunger rates of the country and available excess food from households, restaurants, parties etc.

It is a service that gives people, restaurants, and parties who have extra food that they don’t need or would rather throw away than store, a way to help the ones who need it. There are a people who want to help out and do some form of volunteering work but are unable to commit a scheduled time. This project aims to bring together all these problems and solve them. This project aims to reduce the hunger statistics by providing a medium via which people can donate leftovers without having to go the extra mile, which people might want to, but usually do not have the time to.

India is home to a quarter of all undernourished people worldwide, making the country a key focus for tackling hunger on a global scale.[1] Approximately 300 million people don’t eat a meal a day, and this was the motivation for this Senior Project.[2] Food is not a privilege, but it has become one in India. There are a few similar solutions in the market, but here is why each would not work in a highly populated country like India where 270 million people make less than $2 a day.[2]

OLIO - This app connects neighbors with each other and with local shops so surplus food and other items can be shared, not thrown away.[3] This gives extra food within a short radius, but from people who don't need food to people who can afford food. It also is a sharing system, where there is a responsibility to return the favor. Whereas, this Senior Project gives left over extra food to people who need it and cannot afford it. This project also does not have any obligation to return the favor, it is a philanthropic act.

WINNOW - Kitchen staff can go about their day in the usual manner but with just a few clicks they can track how and what food is wasted.[4] Our system provides both real-time and regular reporting on transparent and measurable data, so that you can easily identify areas for reducing your food waste. This app informs you on how much waste you produce and how to control it. Willow informs you about your wastage, but does not do anything to help you overcome it. On the other hand, this Senior Project actively helps the poor and needy in a country like India to receive the resources they need.

FoodForAll - Food for All is a mobile app through which hungry people can buy restaurants' leftovers at a discount, helping to increase access to affordable meals while also reducing food waste.[5] This way it gives food to the people who need it at subsidized rates.[6] This would work well in a place where the needy can afford phones and an active internet connection. As compared to this Senior Project, which helps us reallocate food to people in dire need.

Harmany – The Harmany app helps connect people who either need to find or want to provide temporary shelter to others when it's needed during emergency and evacuation events.[8] This is a great opportunity for people with smart phones and an active internet connection. Even though this app can be extended to food for the needy, we come across the same problem. People who cannot afford a meal a day, cannot afford a smart phone with an internet connection.

Objectives

This app will strive to try to reduce the hunger problem in countries like India by delivering excess food (which is likely to be thrown away because of the warm weather conditions) from the financially stable to the needy. This Senior Project would include an Android app which will do the necessary real time matching. An Android app is more appropriate than an iOS app because of the financial disparity in India. In general, Apple phones are more expensive than Android phones. In India, Apple phones constitute only 2.5% of the smartphones, whereas Android phones constitute approximately 83% of the smartphones.[11,12] Thus, creating an android app would make it possible to target a larger population of a developing country like India, thereby increasing the possibility of success of the app, which in turn increases the amount of food donated. As compared to a website, an Android app is preferred as a user would want to stay logged in, and receive push notifications. This would be harder to achieve through a website as exiting or quitting the browser app would end the website session, thereby making it difficult to achieve one of the main features of the project which revolves around real time matching of donors and volunteers. Testing of this app with real people would not be necessary, as dummy users from different areas with different addresses can be

simulated. A data set which has a wide selection of users, addresses and type of food would suffice to check the efficiency and other features of the app.

This app will consist of a login and sign up page, where you can either choose “Food Donor” or “Volunteer” as your title. We will not ask for the address yet, to prevent storing the address, and also make it possible for donors to be able to donate food from more than one place, may it be home, parties, friends home etc. Once a food donor logs in, he can donate food, either immediately or at a future time. He can mention his real-time location, amount of food and special needs required like an ice box. For volunteers, they can sign up for current or future available donations. When a donation task is initiated, the app will employ an algorithm to send notifications to relevant volunteers and then matching the donor to the volunteer. Contact details and real time location would be shared once the donor and volunteer are matched. Upon closing the app, users will still remain logged in, thus sending push notifications in real time easier and more efficient.

Significance

This project attempts to overcome the economic disparity in countries like India to help hundreds of people. An Android app, as discussed before would be the ideal pick for this problem. This serves as a good solution as majority of the people in India will be able to donate or volunteer as they like. This solution is significant as it helps the poor without them requiring a smart phone or an active internet connection. This app can be facilitate donations as soon as the donors and volunteers sign up, and volunteers accept tasks that donors donate. This project, thus provides food, a basic necessity to people who cannot afford it. This solution is simple, free and can be used on approx. 83% of the smartphones in India.[12]

This project can be extended to other commodities like flowers, clothes or toys. This would use a similar app structure and would have multiple options allowing the donor to decide what they wish to donate. This app could also be extended to provide shelter during times of need. The end goal is to help the poor, by not expecting any extra help from anyone, but by just informing the volunteers of extra resources. This project can also be extended to bigger nonprofit organizations who can sign up as volunteers. They have more resources to distribute the food. Homeless shelters can also sign up as volunteers, the people picking up the food will be the same as the people needing it.

Methods and Procedures

This project would be written in Android Studio which implements the IntelliJ IDE. User accounts and login credentials will be stored in Firebase. Firebase allows secure storage of user details. Online documentation of Firebase will help me familiarize myself with the database and its features.[13]

Udacity tutorials on basic Android Studio syntax and XML code are very useful in learning how to make an app using Android Studio. I will also refer to Lynda tutorials for

Android App Development. Android apps are coded in Java and will pre-existing Java API's. I will be implementing Google API's such as Google Maps and Google Calendar which will let users provide real-time location, find their way to a particular location by whichever means of transport is most convenient.[14] I will be researching on different algorithms and choose one which will best help match donors to volunteers. This algorithm will be based on the kind of food, distance between donor and volunteer, and rating of the volunteer. This Senior Project is based on trust and merit. We are trusting donors to give edible food, which has not gone bad. We also trust the volunteers to safely deliver the food to the needy.

Expected Outcomes

The main outcome of this senior project is an android application that will match in real time, donors to volunteers who will in turn take food from donors and donate it to the target audience, i.e., the people who cannot afford a meal a day. The database will keep information of all users and let them remained logged in, unless the user chooses to log out. The app will have a simple user interface which will help accommodate even the illiterate. This android application will be run on the latest android software version, which can be downloaded even on low budget devices.

Timeline

DATES	EXPECTED TASKS TO COMPLETE
October 18	Learn about Android Studio, Firebase and how to implement Google APIs
November 2	Start coding - Create a login page with forget your password link. User can Log in and stay logged in
November 23	Forget your password link will send an email to user to reset
December 7	Donor users can start offering tasks
December 21	Figure out which algorithm will allow which tasks to be shown to which users in real time.
Winter Break	Volunteers will be able to pick tasks for current and future dates
January 25	All users will be able to post pictures.
February 8	Buffer period for back log
February 22	Implement Google Maps API to help users share location in real time
March 8	Implement algorithm for choosing volunteers.

March 22	Be able to send real time notifications to volunteers to offer tasks and to donors once the task is picked up
April 5	Try to create group users like NGOs and shelter homes
April 19	User will be able to update profile information and start a weekly donation task. Finishing touches and final app presentation

Special Considerations

I will be using a low-budget android phone to test and run my application. I will need to research more on these and teach myself how to use Android Studio, Firebase and Google API's. I will also rely on Udacity and Lynda tutorials to teach myself these concepts. I will look at different algorithms textbooks for deciding the algorithm to be used for matching users.

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