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Food Waste Management Android Application

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Abstract: The usual known fact about hunger in the world is not shortage of food but rather access to the food. The amount of world's food thrown in garbage is one-third of the total food. Right now, world produces enough food to feed every person on the planet. In order to help, we have developed an android-based application that will provide a platform to the people or organizations to donate their leftovers to those in need. The main objective of this project based on android application is to take care of donations and connecting the donators with those in need. This application will construct a shared collaboration medium for hostels, hotels, restaurants and NGO's or volunteers. This system consists of four modules that are admin, NGO‟s, volunteers and donators. The majority of the population today uses smart phones with active internet connectivity, which is the basic requirement for this product to function properly.

Keywords: food, food waste, waste management, agriculture

I. INTRODUCTION

One-third of world's food production is wasted every year. That's four times what it would take to mitigate under nutrition worldwide. Every thirteen seconds, a child dies from the effects of hunger. More than 2 billion people suffer from malnutrition, even though world produces more than enough food to feed every person on the planet. A meta-analysis through the United Nations Environment Programme in year 2021 discovered that food waste was a trouble in all countries at different levels of economic development. The analysis expected that the worldwide food squandering was 931 million tonnes of food waste.

America wastes roughly 35 to 40 percent of its food, most of it is perfectly edible and nutritious. Even if just one-fourth of the total food presently wasted worldwide could be saved, it would be enough to feed 870 million hungry human beings globally. Also, in exceptionally populated nations like India, food wastage is an upsetting issue. Food waste weighing around 67 million tonnes is generated in India every twelve months which is of value around Rs 92000 crores. For a context, this amount is well enough to feed all of Bihar for a whole year. It's a grim enigma; a country that battles to take care of its population additionally squanders a lot of food.

A contradiction like this puts India in a piquant position: it produces more, squanders more while more people go rich. On one hand, in Global Hunger Index (GHI) India ranks 103rd whilst on the other, the average common household squanders 50 kg of food per individual every year on average. Ironically, 15% of the population is undernourished. Hunger and nourishment is not only a consumer side or demand side problem but rather is a more of producer side or supply side problem. Lack of proper infrastructure to reduce waste could be the major problem. India’s estimated 10 million weddings a year make a contribution substantially to its annual food wastage, which values US$ 14 billion. More than 25% of food prepared at weddings goes to garbage. A significant share of food waste comes from restaurants. According to a local survey in Mumbai, most of the restaurants have 15-20 percent of extra preparation.

The majority of restaurants have a policy of distributing surplus food among staff members and throwing out the remaining in garbage. Out of 100 restaurants surveyed in Mumbai, only three have tie-ups with NGOs and food banks to donate the surplus food. And there are more than 30000 restaurants only in Mumbai. Food loss and waste additionally also amount to a major squandering of assets like drinkable water (21% of fresh water), land, energy, capital, and needlessly emits greenhouse gasses which contributes to global warming and climate change.

Food wastage not only leads to negative environmental impact but also causes huge economic loss. In case we end up making more food than what can be consumed, should not be thrown away. It can feed someone around us who needs that food. What can we do? Planning in the supply chain can improve with the help of technology. we need to view global hunger holistically lack of access to food, faulty distribution, chronic poverty. NGOs, activist, catering companies, and the government across India need to step in to tackle food waste through technology.

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II. LITERATURE SURVEY

In this paper, an instrumentation is formed with the help of four modules to connect people who want to share their extra food and the NGOs, who can pick it up and distribute to the needy. In the proposed application, the donator will be able to post their food details and information which they want to share. The registered NGOs will be notified about the available food. Based on the literature findings, we propose an approach on how to improve the supply chain, resource management and delivering. The paper Beyond food sharing: Supporting food waste reduction with ICTs", published in the year 2016, to guarantee the quality of food to citizens of all level. Regardless of a growing awareness towards the importance of reduction in food wastage among people and managing the extra unwanted food, the role of ICTs in this sphere is still not clear and hardly tabulated. According to the paper „Food donation portal", published in the year 2015, sums up in brief the changes occurred in food donation activities and connectivity of food donors to the NGOs and social work groups. One of the major con in this paper was that it has no GPS tracking availability. Therefore, the donor will have to search for the nearest social groups or NGOs manually.

III. EXISTING SYSTEM

As of now, individuals share their stuffs physically by visiting every association or help group number of times in most of the cases. So as to diminish this problem of food wastage few web sites and campaigns like „Offer my Dabba" have taken the endeavours to assist individuals with sharing their extra food. As of now, the volunteers or the members of social help groups have to visit and search these restaurants and individual donators. They are facing some major problems like communication, finding locations, missing the probable places of getting donations and much more. It is very crucial for all the volunteers to have a proper communication and knowledge of details regarding the distributions and the pick-ups. At the same time, it is also important for the people to know about the NGOs and the volunteers. Existing old system comes with many cons, some of them are:

- Food donation and Restaurant might not reach the other person residing at a different locality.
- The donator has to find the NGO and the social organization manually.
- Existing system is complex and more time consuming.
- Chances of data redundancy.

IV. PROPOSED SYSTEM

The proposed system is a purely android based application, which acts or provide a platform to the people for donating and distributing their left-over food to those people who are in need. This application can be an effective medium to the people residing in the country like India to donate their extra food conveniently. Basically, this system consists of four modules which are: admin, NGOs, volunteer, user. NGOS, volunteers and the users will have to register themselves on the application by offering their details.

The admin will have access to all the data and responsible for accepting and denying all the request. The admin can approve all the registrations and login along with the picking up of the items from the donator. The proposed android-based application, is developed using Android Studio 4.0.3, using Java and Xml. This application also uses Firebase technology for authentication and real time database. Along with this, we have also used Google Map API to get current location of the user in the backend and finding that location in Google Map.

Whenever a person registers themself as a user and either wish to donate or receive, it gets in real time database. This information is retrieved any time, when the other person wishes to donate or receive the stuff. User is then directed to Google Map for locating the delivery or the pick-up. The user interface of this application will be kept user friendly and simple.

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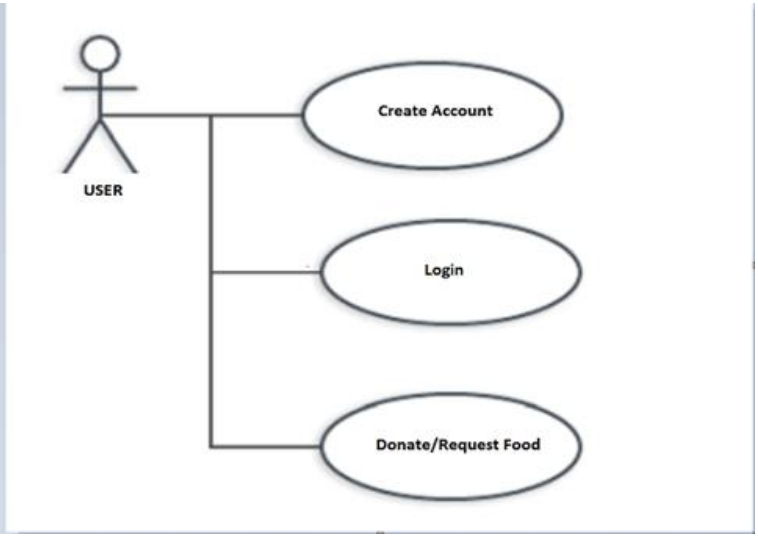

Fig.1 User Module Activity.

System Module and design:

ADMIN: Admin will be having all the official power to control the flow of data from one segment of the system to the other. Admin will be responsible for accepting and denying all the raised request related to donation. Whenever a request is raised the admin will accept the request and grant it, or admin can cancel the request according to the circumstances.

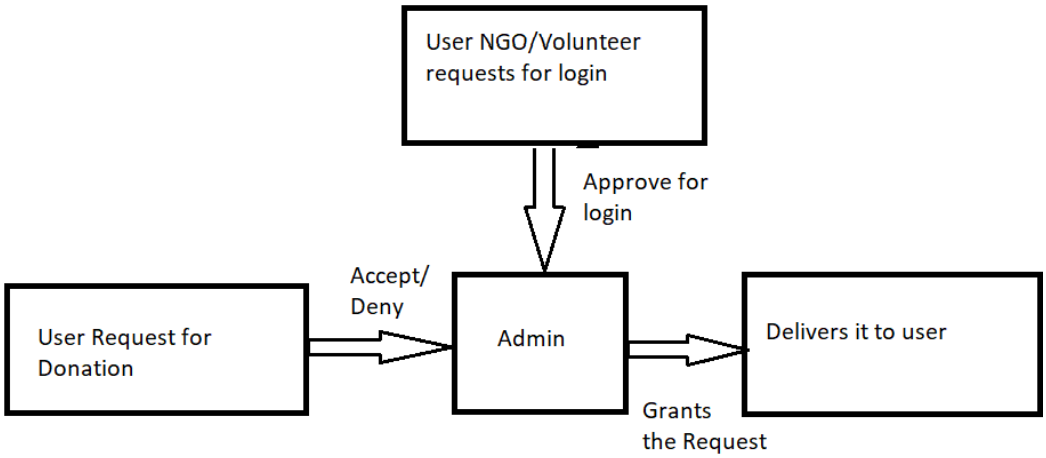

Fig.2 Admin module

NGO: This module will accept the request of donor, or will raise request for the donators to donate. NGO module will be responsible for assigning volunteers for pickups and deliveries. They will take care of whole supply chain and manage the flow of leftovers.

User: User will first register and then login to the application. Afterward, they will request a pick up for the stuff they want to donate. If the request is approved by the admin, a volunteer will reach to the user and collect the item.

Volunteer: Volunteer will also have to register. Volunteers will accept the request given by the management. They will reach the location of user, and collect the item. After the collection, volunteers will reach to the location that is assigned by the NGO or the social help groups for delivering.

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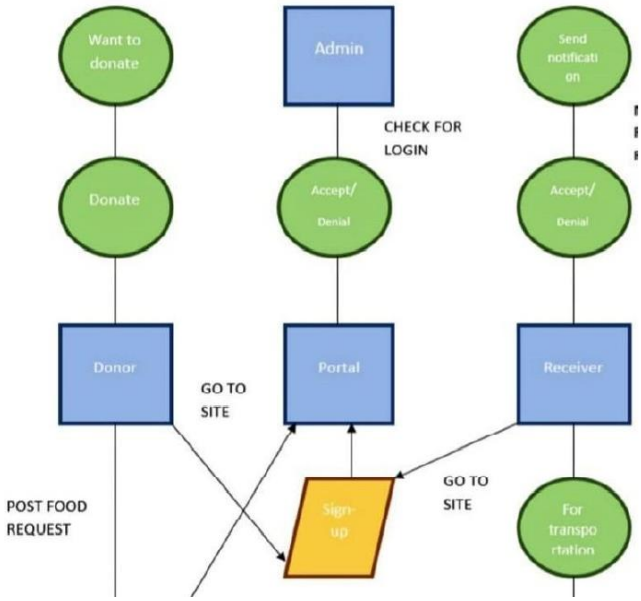

Fig.3 System Workflow

V. SYSTEM ARCHITECTURE

The device structure of the proposed system follows the MVC model version that works by the approach of dissociation of concerns. There is a standard modus operandi for the 3-tier architecture: Client tier, Server tier, and Data tier. The Server tier consist the business logic, which likewise make the utilization of a web service: Google Maps Web Services using Google Maps Distance Matrix API. The Data tier stores all the data we are using in the application. The Client tier comprises techniques that assist with laying out connections with the server side. Besides following the necessities, it is liable for finding the location of the device either by the help of GPS or internet. It is java based and uses XML for the layouts.

VI. SYSTEM LIMITATIONS

The proposed application is very efficient and user friendly for android device user. However, this system has some limitations also. One of the major draw-back of this application is that it will not work on IOS devices.

VII. FUTURE SCOPE AND IMPROVEMENTS

In a country like India, this application has a huge scope. The solution showed through this project is worthy enough to battle food loss and waste through charity and donation. Moreover, this application can be of great use in case of natural calamity like an epidemic spread. Hundreds of tonnes of food wasted in weddings can be used to fulfil the needs of poor people. System like this has a great potential to fight food crisis problem of India and other countries. There is also many scopes of improvement in this system application. For ex: the concept of QR code, which is a type of two-dimensional bar code can also be used to store contact information, uniform resource location, product details etc.

VIII. CONCLUSION

The proposed Android application ends manual communication problem, supply chain management issues, difficulties regarding reaching out to probable locations. One of the major advantages of this system is that it reduces human work, time consumption per donation. This application can be of great use to fight the problems like malnutrition, hunger and starvation. Along with solving food wastage problem, it can also help in economic front, loss of natural resources like pure water, fuel and environment degradation. This proposed base paper explains a novel decision support tool to enable a range of extra food management alternatives and a maximum sustainable solution. The main approach behind developing this system was to lessen food waste volumes and redirect the surplus food toward the individuals in need. The link between distinct modules has been mentioned and the practicality of this procedure in a software program-based guide tool is explained in this paper

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