Surplus Food Distribution and Management

Shalabh Garg¹, Chaitra. B², ShreyaRanjan³
Student¹,², Assistant Professor³
Department of Information Science & Engineering
Acharya Institute of Technology, Bengaluru, Karnataka, India

Abstract: “Food wastage and hunger is one of the major problems the world is facing”, due to improper management of surplus food [1]. Tons of food is wasted daily, still millions of people sleep hungry every night. Surplus food is often dumped in the garbage leading to several health and environmental issues. In the recent past, various initiatives were taken to solve the problem but they were not technology efficient and could not fulfill the expected demand. By implementing the advanced technologies this problem can be handled by decreasing manual effort and time constraints leading to proper distribution of surplus food to the needy people. This can be achieved by creating a platform for food donors and receivers of food with the help of a mobile application, Linear Regression and Sensor technologies.

Keywords: Linear Regression, Smart Dustbin, Sensors.

I. INTRODUCTION

Today, technology has changed the way we do everything; it has made the world a social habitat in which everyone is connected through social media channels & mobile applications. Technology has solved many problems which has made our life easier. The most recent concern of the world addressed is hunger, Food wastage and improper management of surplus food[2]. To address the issue and make past systems more efficient & time effective surplus food management concept was introduced which uses latest technologies such as mobile applications, Linear Regression technique, Sensor technology and GPS. Surplus food distribution and management is a mobile application which creates a common platform for restaurants and NGO workers to work together for the distribution of the edible food to the needy people and also manage the non-edible food with the help of Sensor based smart dustbin[3]. The application also provides GPS technology to track down the smart dustbin location, management of garbage with the help of sensors and thus notifying the concerned authorities.

II. PROBLEM STATEMENT

Due to the lack of technology usage an improper management of surplus food distribution prevails. Often edible food is dumped, which could have been used to feed the needy people. Also another major problem is management of non-edible food thrown in the dustbin causing several health issues.

III. PROPOSED METHODOLOGY

Five major modules have been considered as shown in the diagram below. Each module has its own methodology covered.

- **Login/Sign up for Restaurant and NGO**
  Here, the restaurant can either login or sign up. Once they are able to login they will be navigated to the page where segregation of food is done. Here, the data is collected and further processed. NGO can also login and can view data regarding the food.
Data entry by NGO

• **Data Entry:** Once the authorization is done, using back endless the registered NGO will have access to enter the number of people at a particular hunger spot.

• **Categorization with respect to Age:** Here the number of people can be entered with respect to different age groups such as 15-20, 20-30, 30-40, 40-50 and 50+

**Prediction and distribution of surplus food**

• **Quantity Prediction:** Once the number of people at a hunger spot and food is collected by the restaurant, the prediction can be done using Linear Regression technique.

• **Linear Regression:** This Machine Learning algorithm uses two variables, i.e. independent and dependent variable. Here the independent variable is the number of people and dependent variable is the quantity of food to be distributed. Linear regression consists of finding the best-fitting straight line through the points using the two variables[7].

**Garbage collection using Smart Dustbin**

• **Collection of garbage:** After segregation, if the food is non-edible the restaurant is redirected using GPS to the location of the smart dustbin where they can dump the waste food. Smart Dustbin consist 8051 development board with SST89E516RD NXP IC and also GSM module and sensors [4][5].

• **Categorization of Sensors:** The sensors are categorized into 3 types: pressure sensor, fire sensor and odor sensor[8].

• **Usage of Sensors in Smart Dustbin:** All these three sensors can be distinguished according to their functionality. The pressure sensor identifies whether the pressure applied is greater than the threshold, the fire sensor senses the fire and the odor sensor identifies the poisonous odor released by the garbage, after which it notifies the concerned authorities using SMS notification[6].

• **Pressure Sensor:** Pressure Sensor takes the force exerted by the smart dustbin. If suppose the dustbin is full, then “dustbin full” message is displayed on the LED. Also it notifies the concerned authorities about the status of the dustbin. A pressure sensor works by converting the pressure exerted into electrical signals[9].

• **Fire Sensor:** A fire sensor detects and responds to the presence of fire. The circuit is sensitive and on sensing rise in temperature due to fire sends an SMS text to the concerned authorities warning them regarding the fire[9].

• **Odor sensor:**

An Odor sensor detects a harmful smell for example alcoholic smell. On identifying the odor it warns the concerned authorities regarding the poisonous odor detection[9].

• **Text Message Notification:**

The technology used to send text messages is SMS. Once any trouble is detected related to smart dustbin a SMS is sent to the concerned authorities.

**IV. ADVANTAGES**

- Provides a platform for restaurants to manage their surplus food.
- It segregates the edible and non edible food.
- Provides food to those in need.
- It also manages the non edible food by dumping in the smart dustbin
- Alerts the city’s concerned authorities when the dustbin is full, or on fire or having a harmful smell.

**V. RESULTS**

The result comprises the surplus food management application, linear regression graph and the smart dustbin.
VI. CONCLUSION

Surplus food distribution and management demonstrates an efficient demand and supply model for distribution of surplus
food from restaurants. This model can help in donating food which was not possible earlier. Our model optimizes the balance between economic, social and environmental benefits. Not only it focuses on the latest use of technology but also works towards social, economic and environmental purpose. Linear Regression, mobile application and sensors helps in achieving the goals.

VII. FUTURE ENHANCEMENT

This work has laid a foundation for the efficient Surplus food management and it opens up several avenues for future work in efficient food management in grid environment. This application works only in android compatible devices, in future it can be extended for IOS application

VIII. REFERENCES


[4].G.SaiRohit ; M Bharat Chandra ; Shaurabh Saha, Debanjan Das (2018)Smart Dual Dustbin Model Waste Management in Smart Cities 3rd International Conference for Convergence in Technology (I2CT)


[7]. Sonali Shukla ; Sushil Kumar ; Bhupendra Verma, 2009, A linear regression-based frequent itemset forecast algorithm for stream data. Proceeding of International Conference on Methods and Models in Computer Science (ICM2CS)
