Food Bank using Internet of Things

Sanjay Kumar Suman[1], L. Bhagyalakshmi[2], A. Athifshah[3]

[1] *Professor, Department of ECE, MNM Jain Engineering College, Chennai, TN, India*
[2] *Professor, Department of ECE, Rajalakshmi Engineering College, Chennai, TN, India*
[3] *Managing Director, ABE Semiconductor Design, Chennai, India*

ABSTRACT

With the enhancement of technologies in various fields our lives are directed to the intelligent and smarter regime. We are following new technologies rather than old approaches. Thus the devices ought to be smart enough to recognize our needs and also assist us in utilizing the resources usefully. Food bank is a concept that has been in existence for many years and also through years it has changed through the evolving technologies. This current lifestyle that we are all experiencing is a fast paced one and no one has any time to do anything apart from his/her daily routine. We also know on the other hand, the scenarios of orphanages and other homes and their struggle to get enough food to provide their occupants and also various needy people. This paper deals with the designing of a food bank as a device which is able to sense the food items kept inside it that has been placed by public people. Having sensed the items inside it then informs the person belonging to the respective orphanage about the quantity of food available for collection. This thus helps public to indulge ourselves to contribute for a noble cause without taking much of our time and also on the other hand help orphanages and old age homes to feed their people.

Keyword : - *Food Bank, Internet of Thing, Wireless Fidelity*

1. INTRODUCTION

The United Nations Food and Agriculture Organization estimates that about 795 million people of the 7.3 billion people in the world, or one in nine, were suffering from chronic undernourishment in 2014-2016. Almost all the hungry people, 780 million, live in developing countries, representing 12.9 percent, or one in eight, of the population of developing counties. There are 11 million people undernourished in developed countries (FAO 2015; for individual country estimates, see Annex 1. For other valuable sources, especially if interested in particular countries or regions, see IFPRI 2016 and Rosen et. al. 2016).[1]About 21,000 people die every day of hunger or hunger-related causes, according to the United Nations. This is one person every four seconds. Sadly, it is children who die most often. Yet there is plenty of food in the world for everyone. The problem is that hungry people are trapped in severe poverty. They lack the money to buy enough food to nourish themselves. Being constantly malnourished, they become weaker and often sick. This makes them increasingly less able to work, which then makes them even poorer and hungrier. This downward spiral often continues until death for them and their families [2].

India, with a population of over 1.2 billion, has seen tremendous growth in the past two decades. Gross Domestic Product has increased 4.5 times and per capita consumption has increased 3 times. Similarly, food grain production has increased almost 2 times. However, despite phenomenal industrial and economic growth, while India produces sufficient food to feed its population, it is unable to provide access to food to a large number of people, especially

1.1 State of Hunger in India

Hunger in India is a complex issue. It is widespread and the causes are different across various regions. According to latest FAO estimates in 'The State of Food Insecurity in the World, 2015" report, 194.6 million people are undernourished in India. By this measure India is home to a quarter of the undernourished population in the world. Also 51% of women between 15 to 59 years of age are anaemic and 44% of children under 5 are underweight. Malnourished children have a higher risk of death from common childhood illnesses such as diarrhea, pneumonia, and malaria. The Global Hunger Index 2014 ranks India at 55 out of 76 countries on the basis of three leading indicators -- prevalence of underweight children under 5 years, under 5 child mortality rate, and the proportion of undernourished in the population [3].

1.2 Facts about hunger in India

- Largest India is home to the largest undernourished and hungry population in the world

- 15.2% of our population is undernourished

- 194.6million people go hungry everyday

- 30.7% of children under 5 are underweight

- 58% of children stunted by 2 years of age

- 1 in 4 children malnourished

- 3,000 children in India die every day from poor diet related illness

- 24% of under-five deaths in India

- 30% of neo-natal deaths in India[3]

1.3 Food waste in Indian Parties and weddings

As the ranks of India's wealthy surge with rapid economic growth, many families are staging extravagant displays of food at their children's weddings to show off their newfound affluence. About one-fifth of the food served at weddings and social gatherings is discarded. The prodigious waste that follows has horrified many in a country where food prices are skyrocketing and tens of millions of young children are malnourished. Guests invited in weddings are mostly responsible for the food wastage because of different thoughts, mostly they have the fear that if they go second time to take the food they won't get it, for the first time they have seen the food they have never eaten before or due to lack of education they do not realize that if they take extra food it will get wasted. Around 100,000 weddings and social events are held in India every day. Food wasted each day at weddings and family functions in Mumbai alone would be enough to feed the city's vast slum population. About 58 per cent of people in the country are food insecure, says the findings of the National Nutritional Survey (NNS) 2011. The country has enough food to feed its people but that poor cannot afford even two-square meals a day. Some 15-20 per cent of food is wasted in marriages and various such social functions. In some cases, the waste is to the extent of 20-25 per cent when the number of dishes exceeds the number of guests invited to the marriage halls. About 21 million tonnes of wheat are wasted in India and 50% of all food across the world meets the same fate and never reaches the needy. In fact, according to the agriculture ministry, Rs. 50,000 crore worth of food produced is wasted every year in the country [4].

1.4 Existing Systems

In India we have seen several food banks that work on the basic principle of serving food to various homes and the needy. With several developments in technology they have taken several forms such as of Whatsapp, Facebook and other groups and also websites, toll free numbers for immediate assistance in collection of remaining food items.

2. NEED FOR A PROPOSED SYSTEM

As can be seen from the above paragraphs pertaining to hunger and poverty it is indeed very difficult for the government and other related organizations to eradicate poverty and hunger at a stretch and it may take several years to do so. The proposed project aims at the help of the public people and it is a step that is taken to at least bring down hunger and later poverty in India. India is a very densely populated country , but rather than looking at this fact as a weakness we can make this fact as a very much a strength as we people can donate generously not in the form of money but as that of the remaining food and do our part to reduce hunger to an extent and tomorrow this might make a huge difference in society and with the help of government this project then can have a wider reach

and effect. Although there have been a sea of development in the working of the food bank but what is still a disadvantage is active participation of the public and the time involved with the existing banks is still more as people have to wait at their homes till the concerned person comes and picks up the food items as well as the public have to know the exact contact to reach the food banks.

3. PROPOSED SYSTEM

The project proposed basically is about the management of food that we generate as an excess of rice, vegetables and other corresponding food items that we generate daily. Although we know that there is an excess we simply do not bother but just throw it away, some people would want it to be given to the needy but without proper contact and time they would also end up throwing it into the bin. The food bank thus proposed is an idea that effectively manages the excess food cooked and it helps in easy donation of the food to the needful. The bank consists of a load cell that is interfaced using raspberry pi and arduino microcontroller which initially detects the food placed and it measures the weight using the load cell and this information of weight is serially read by the pi from where it is uploaded to the Iot application tool called "Thingspeak" through wi-fi and when the weight reaches a threshold value it is notified to the concerned person through a tweet via the IoT application tool "Thingspeak" which is used as a cloud as well a decision making tool to trigger further actions. This thus solves us a major problem of food management at the same time offers us the opportunity to indulge ourselves for a noble cause and that too without spending much of our time and also do it in a simple and an efficient manner. The block diagram of the food bank proposed is given below.
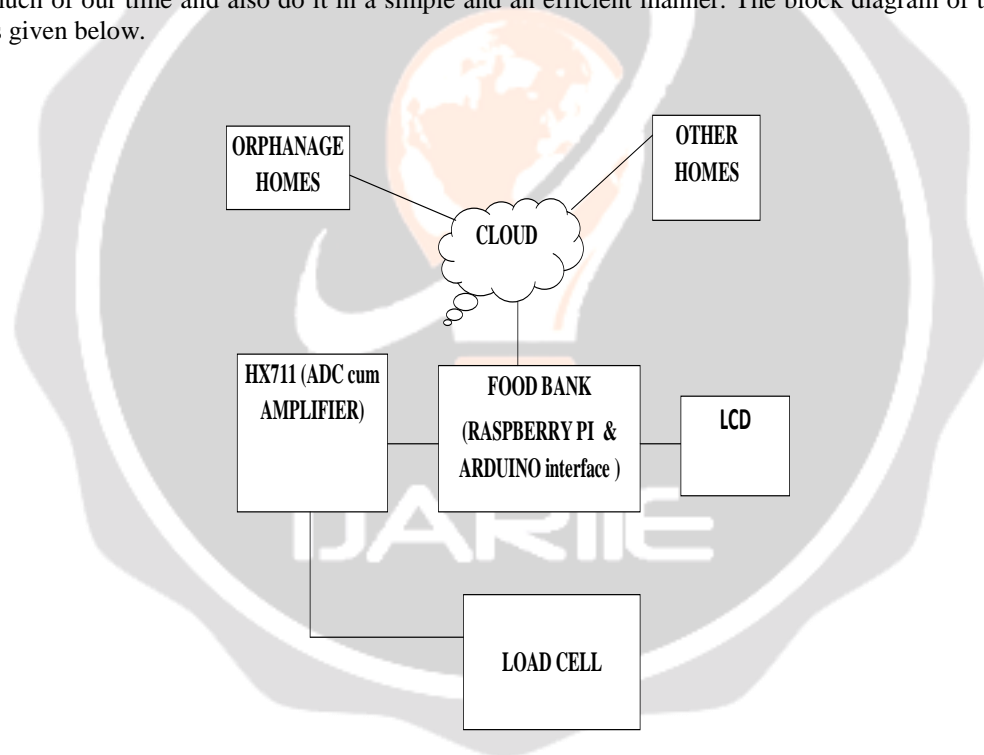
Fig -1: Food Bank Device

4. PROCESS FLOW

The steps followed for designing the system are:

1- Check the initial value of the food item which is kept inside the Food box
2- Food items picked from the box
3- Compare the status of food items (present value with threshold value)
4- If load value is above the threshold value then send the notification to the user on the mobile phone on twitter through Things peak
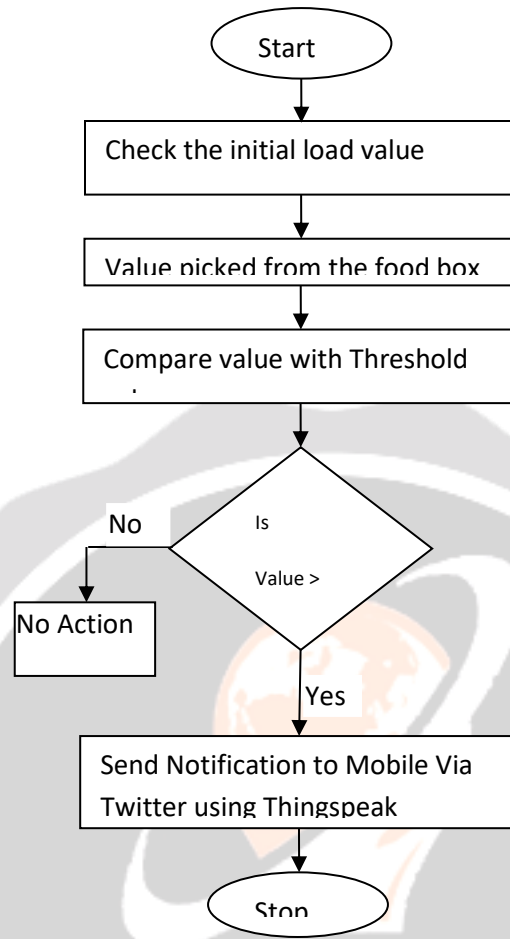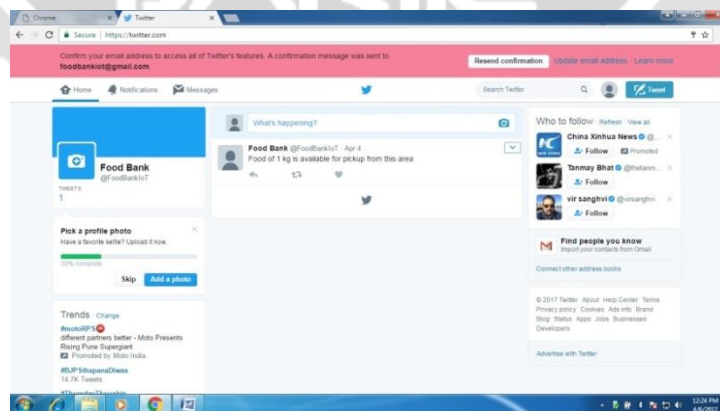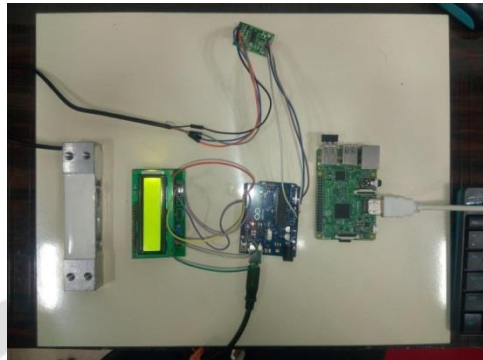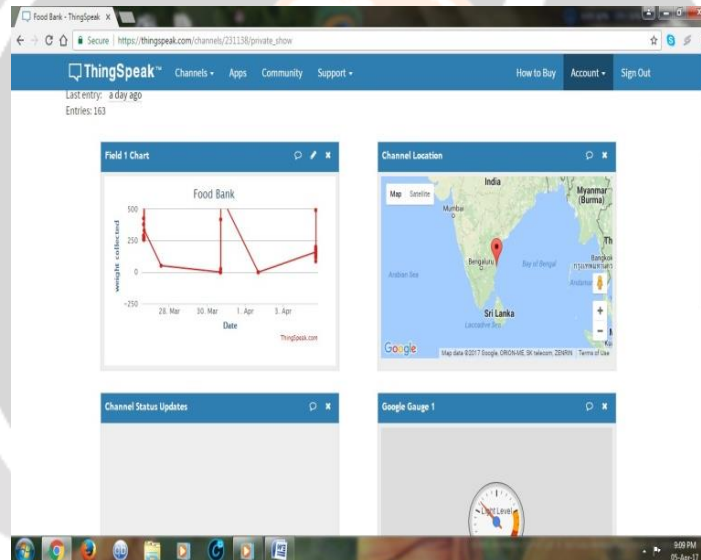
Fig -2: Flow chart

Fig -3: Twitter Notification

5. RESULTS

This section provides the experimental result of the proposed projects. Figure 1 shows the hardware setup for the proposed project whereas figure 2 shows the analytical thingspeaks view of the proposed system.

Fig -4: Hardware Implementation

Fig -5: Thingspeak view

6. CONCLUSION AND FUTURE WORK

As explained and presented we have thus obtained a smart device that helps in easy donation of food to the needful which does not take any time or any contact but only your big heart to donate food to the feed the thousands of hungry people. It can serve more than a notifying device and might bring in a great change if certain more features are added and it thus helps us reduce the time and efforts taken by public as well as the NGO's and other organizations to distribute food and thus brings them closer.

The device proposed can be improved further to serve and can be made smarter by using smarter preservation techniques can be included to help preserve food for a longer time. This concept of a food bank can be extended to not just food alone and can be adopted for donations of clothes, books and other useful things that might be of use to others. This thus can serve as a starting step to a revolution of a hunger free India.

7. REFERENCES

[1]. Hunger and World Poverty(http://www.poverty.com/)

[2]. 2016 world hunger and poverty facts(http://www.worldhunger.org/2015-world-hunger-and-poverty-facts-and-statistics)

[3]. Hunger in India(http://www.indiafoodbanking.org/hunger

[4]. Food Wastage in Indian Weddings and Parties(https://blog.venuemonk.com/2016/06/06/food-wastage-in-indian weddings-and-parties/)