IoT Based Kitchen Inventory Tracking System

Kamalesh R, Rajesh N, Dr. Shivraj B W, Dr. Renuka Prasad

RV College of Engineering, Bengaluru, Karnataka, India

ABSTRACT

Web of Things innovation is changing our day-by-day life by implanting sensors and actuators in all the machines we use. The percepts from sensors are brilliantly controlled to settle on better choices. Our framework is presenting the utilization of Internet of Things innovation in the kitchen. In the current situation, shopping for food should be possible on the web. Be that as it may, monitoring some food supplies is the principal work of the individual dealing with kitchen, bombing which will bring about deficient things to cook. The framework expressed in this paper removes this duty from the individual taking care of kitchen. The goal of this paper is to propose a framework which will follow the accessibility of staple goods in the kitchen. The test information is considered by the everyday use of a grain in the kitchen. Monitoring the kitchen stock prompts more educated arranging and dynamic. With innovation progressing in a high speed and everything around us getting robotized, individuals like to screen and play out their everyday exercises by utilizing the keen gadgets they convey wherever instead of physically recording and observing things. Keeping up and monitoring ordinary basic food stock is getting one of the serious issues in different families, cafés and natural pecking orders. Recharging the holders at the right second and furthermore knowing the expiry of food sources is a significant concern. Working individuals and occupied cafés think that it's hard to keep track since it requires human mediation at the opportune time.

Index Terms - Kitchen inventory techniques, Inventory management, Oraganize inventory, Internet of things.

I. INTRODUCTION

IOT has changed life of humans. Each thing is uniquely identifiable through its embedded computing system within the internet infrastructure. Taking advantage of IOT function we develop a project on smart Kitchen Management using Sensing the weight of a kitchen storage container. Your pantry will reflect your cooking style. Organize your pantry according to types of foods so that you can find things. Grains: Rice, pasta, oatmeal, etc. Root vegetables: onions and potatoes, and the like can go in your pantry. And we can find out the actual storage and remaining item quantity for a specific time period and notify. In order to produce the desired strain for determining the container's weight, the load cell needs to be mounted between two flat surfaces with the help of the two threaded holes on each side of it. Once mounted, the flat surface can act as a scale for measuring the weight of a storage container on our mobile application and Track food consumption.

We can also work on Generating list of items of remaining item quantity. profitable for more educated arranging, dynamic and extravagance of people.

Consistently the modem individuals anticipate that new gadget and new innovation should streamline their everyday life. The pioneers and looks like are continually attempting to discover new things to fulfill the individuals utilizing advancements however the cycle is as yet endless. Presently a day, kitchen robotization got current and exact to screen the fields. During the 2000s, Internet network turned into the kind for some applications and today is normal as a component of numerous ventures, modern and customer items to give admittance to data. Be that as it may, these gadgets are still essentially things on the communication and observing through applications and interfaces. With the progressions in Web advances, and remote sensor organization (WSN), another pattern in the period of universality is being figured it out. Colossal expansion in clients of web and alteration on the web working innovations empower systems administration of regular items. Akshay Pendbhaje et al. proposed the IoT in Home Grocery Management System. They utilized the heap cell to gauge the basic food item weight, Raspberry Pi microcontroller board which employments MQTT protocol. The objective of this paper is to propose a system which will track the availability of groceries in the kitchen [1]. Hardi Desai et al proposed IOT based fundamental need noticing structure to screen the staple measurements at homes and market. Here weight sensors and far-off transmission module related with a central center point. The central center is accountable for dealing with the data got from the pile sensors. By moving this data into online data stream, it will in general be used for additional assessment. Taking into account the got data, fundamental stock level in each house is assessed. Nerella Ome et al. proposed an IoT based sensors to cloud framework utilizing ESP8266 and Arduino Due. In this framework sensors like temperature sensor and dampness sensor are utilized to detect data the gadget and converts it to computerized utilizing Arduino board. Arjoo Pathan et al proposed a framework Smart Super market structure for Shopping Mall. This uses RFID readers and IoT. This makes shrewd crates in which the RFID resders are joined. This will demonstrate the all-out Bill measure of the products which is in the bushel by perusing all the RFID Tags appended to each great. These RFID peruses are joined to the top edges of the container or the streetcar. Likewise, it will show the heaviness of the crate and the quantity of things dropped into it alongside complete expense. Santosh H. Kalange et al proposed Smart Retailing using IoT. This structure uses RFID follower, RFID Tags, Lad cell, HX711 weight sensor, Wi-Fi module, Arduino Uno board. The principal pointed of undertaking is using IoT development tackle the certifiable issue face by retailer and customer using the android App. In proposed structure retailers understands that number of things stays in market.

## II. CONSUMER AND ENTERPRISE IOT APPLICATIONS

There are various genuine uses of the web of things, going from purchaser IoT and venture IoT to assembling and mechanical IoT. IoT applications range various verticals, including car, telco, energy and that's only the tip of the iceberg. In medical services, IoT offers numerous advantages, including the capacity to screen patients all the more near utilize the information that is produced and examinations it. Emergency clinics frequently use IoT frameworks to finish assignments, for example, stock administration, for the two drugs and clinical instruments. Savvy structures can, for example, lessen energy costs utilizing sensors that recognize the number of tenants is in a room. The temperature can change consequently for instance, turning the climate control system on if sensors distinguish a gathering room is full or turning the warmth down if everybody in the workplace has returned home. In agribusiness, IoT-based shrewd cultivating frameworks can help

screen, for case, light, temperature, dampness and soil dampness of yield fields utilizing associated sensors. IoT is additionally instrumental in robotizing water system frameworks. In a savvy city, IoT sensors and organizations, for example, keen streetlamps and shrewd meters, can help mitigate traffic, preserve energy, screen and address ecological concerns, and improve sterilization.
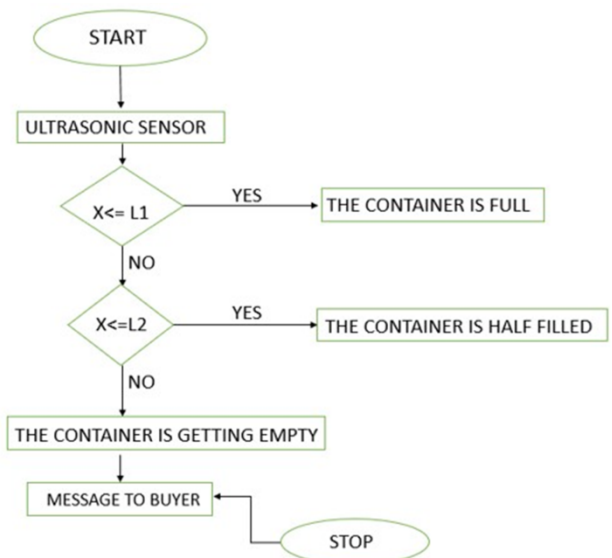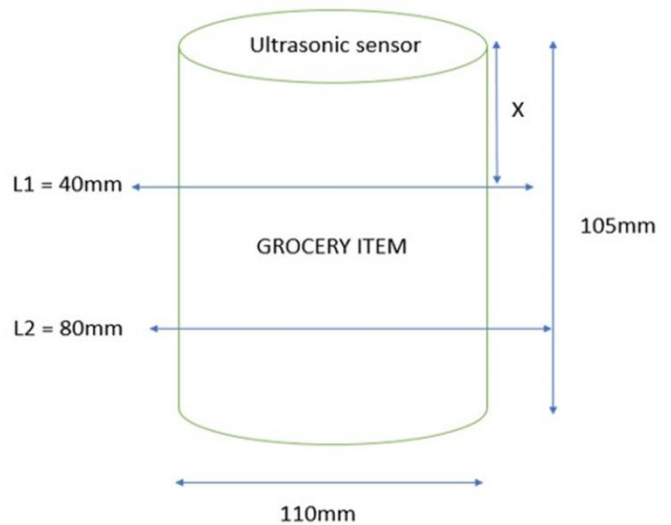
III. OBJECTIVES OF STUDY

1. The proposed system helps to smartly handle the grocery management at home so that to avoid situations like forgetting to buy grocery at emergency.
2. It is made to help the working woman to manage grocery backups.
3. It is made to help geriatric people so that they get rid of going to shopping regularly.
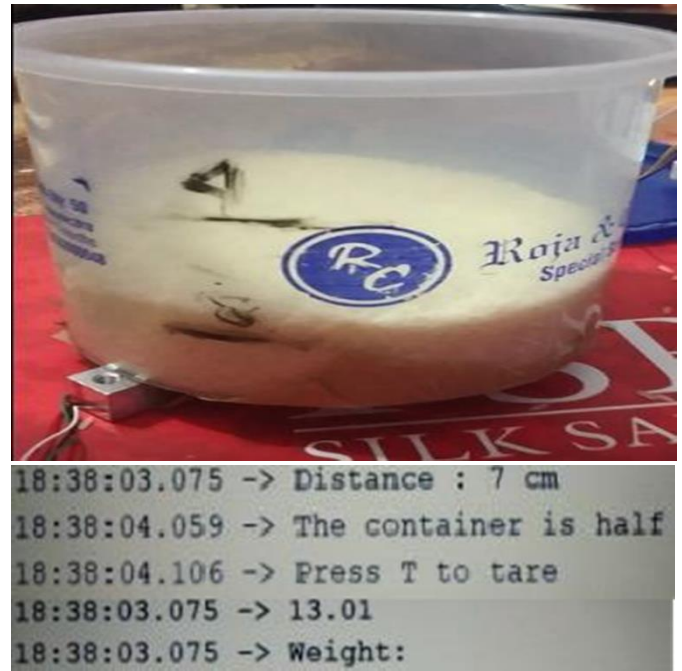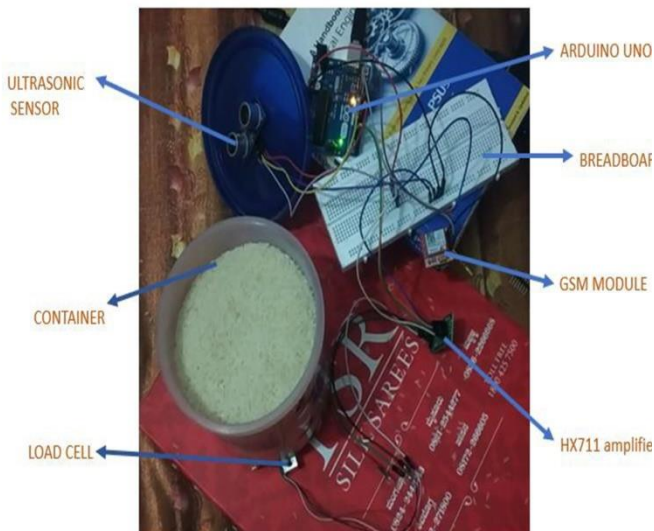
IV. METHODOLOGY
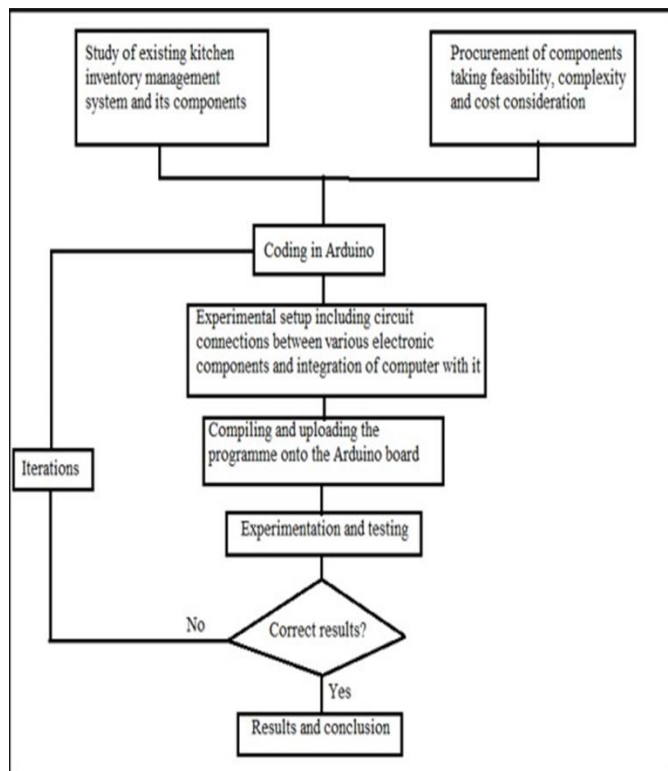
V. FLOWCHART

The setup includes components as discussed such as Arduino board, Breadboard, Ultrasonic sensor, Load cell, HX711 amplifier, GSM module, Male to Male, Female to Female and Male to Female jumper cables. The initial connections are made as per the circuit diagram (Refer Fig). Program (C++ language) for working model is uploaded to Arduino board. A container is chosen for filling the grocery item. Working model has been divided into three zones as shown above. X is the distance measured by the ultrasonic sensor from the cap of the container. Load cell is kept at the bottom of container to calculate the
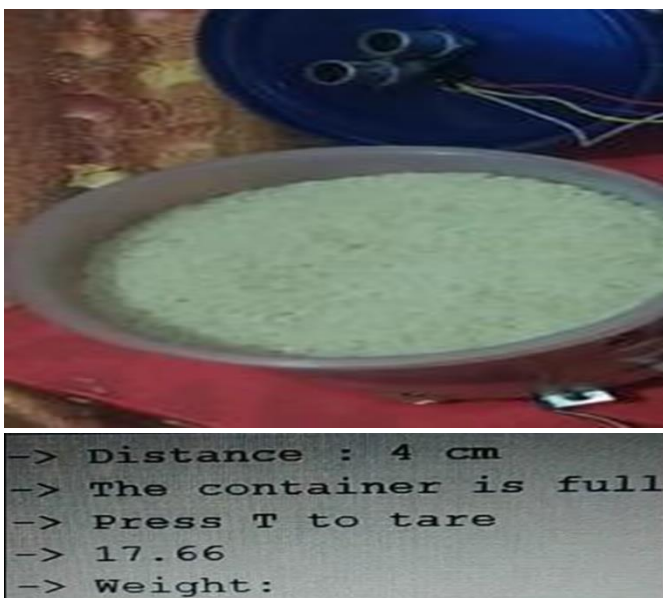
weight of the grocery item. HX711 amplifier is used to amplify signal from millivolts of load cell to volts(v). GSM module is used to send the signal to the buyer when the grocery item is getting empty.
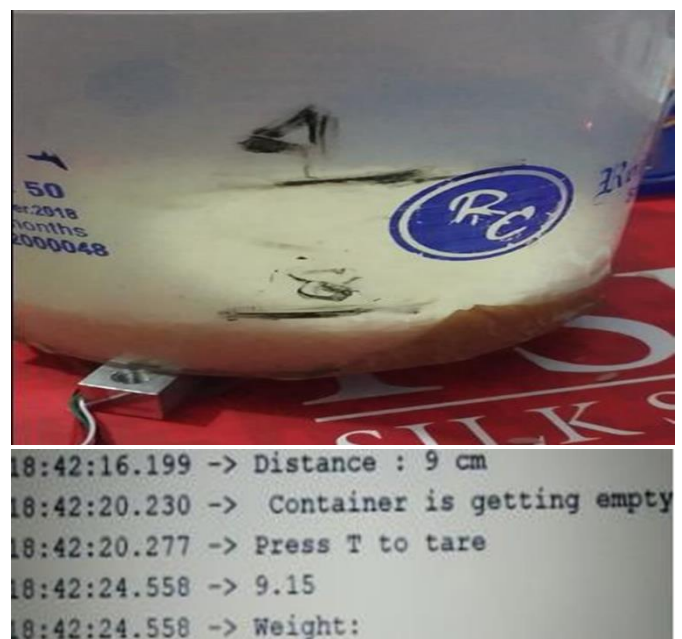
VI. WORKING SETUP

VII. RESULTS AND DISCUSSIONS


```
-> Distance : 4 cm
-> The container is full
-> Press T to tare
-> 17.66
-> Weight:
```

The result shows that the grocery item is at a distance of 4cm from the cap of the container. It shows that the container is full and weight is 17.66 units.


```
18:38:03.075 -> Distance : 7 cm
18:38:04.059 -> The container is half
18:38:04.106 -> Press T to tare
18:38:03.075 -> 13.01
18:38:03.075 -> Weight:
```

The result shows that the container is half filled and the weight of grocery item is 13.01units.


```
18:42:16.199 -> Distance : 9 cm
18:42:20.230 -> Container is getting empty
18:42:20.277 -> Press T to tare
18:42:24.558 -> 9.15
18:42:24.558 -> Weight:
```

The result shows that container is getting empty and weight of grocery item is 9.15 units.

After this the GSM module sends a message to the buyer that container is getting empty and sends the weight of the grocery item.

The circuit is prepared and tested. It showed good results with 86 milliseconds and the delay time of the sensor is 1 sec. The range of the sensor is up to 6 meters and there is a signal for every change of quantity of grocery in the container. Due to high sensitivity of sensor, there was fault in distance accuracy to divide the zones. This can be reduced by manually reducing the sensitivity of the sensor and increasing its delay time between each signal output. The overall cost of the model came out to be around 3000rs.

Excitation voltage (input voltage) = 5V
Range of measuring voltage by load cell = 250mV
Load cell sensitivity, (mV/V) = Range of measuring voltage / Excitation voltage
= 250/5 = 50mV/V
In the 1st Zone:
Observed reading = 17.66mV
= 17.66/1000 = 0.01766V
Full scale reading by load cell = 10kg Observed reading = 0.01766*10 = 0.1766 V-kg
Output reading in terms of Kg = 0.1766 / (250/1000)
= 0.706kg
= 706grams Similarly, for 2nd Zone and 3rd Zone are 522grams and 366grams.

VIII. CONCLUSION

Ultrasonic sensor checks the quantity level and sends the output to Arduino board. Gsm module sends SMS to the respective grocery buyer. Although the system may not be able to provide advanced solution to the kitchen inventory, it provides a detecting item in a small scale. Amplifier is used to amplify load cell signals to send it to Arduino board. This system is connected with online grocery shop, as a result user will easily buy their goods before running low through their mobile device.

In future it can be designed the system in a way by replacing separate Arduino with a microcontroller on the chip. This reduces the size and cost of the system while improving its functionalities. The system can also be integrated with food industries, Restaurants, etc, to manage the grocery backups.

IX. REFERENCES

[1]. Akshay Pendbhajh, Prof.Sangeetha Rajesh, "IOT in Home Grocery Management", 4th Somaiya International Conference on Technology and Information Management, 2017.

[2]. Hardi Desai, Divya Smeet Somaiya, Hetal Mundra, "IoT based Grocery Monitoring System" in 14th International Conference on Wireless and Optical Communications Networks (WOCN), 2018.

[3]. Chetal.S. Patil, Kanaksing.N. Pawar, "SMART GROCERY MANAGEMENT SYSTEM USING INTERNET OF THINGS", International Journal of Research in Engineering and Technology, Volume: 05, Issue: 07, 2016, pp 97-101.

[4]. Ruinian Li, Tianyi Song, Nicholas Capurso, Jiguo Yu, Jason Couture and Xiuzhen Cheng, IEEE "IoT Applications on Secure Smart Shopping System", IEEE Internet of Things Journal, Volume:04, Issue:6, 2017.

[5]. Mr.Nerella Ome, Mr.G.Someswara Rao , "Internet of Things (IoT) based Sensors to Cloud system using ESP8266 and Arduino Due", International Journal of Advanced Research in Computer and Communication Engineering, Volume:05, Issue:10, 2016, pp 337-343.

[6]. Steps involved while Introducing a New Product into A Healthcare Organisation, Shivaraj B W Apoorva V, Achyutha, W M,Hemalatha J N, 2017,Proceedings of the IEEE 2017 International Conference on Computing Methodologies and Communication (ICCMC), Volume 978 Issue 1, Pages180-184.