SMART REFRIGERATOR FOR STORING FOOD

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Abstract

Rapid improvement in technology tends to use smarter devices in day to day life, one such device is refrigerator. The refrigerator plays a significant role in storing food products in portable kitchens and shops. There is a need for a more effective way to monitor the quantity of food materials left for the next four days and it is important to use the appropriate quantity in the case of a shop to boost the business. The proposed Internet of Things (IoT) framework recognizes the scarcity of food products by transmitting the amount of food items accessible to users through a mobile application. It gives an alert to the users to place an order if the weight falls below the threshold value. Classification and Regression (Prediction Algorithms) are used in the proposed system to prefer seasonal fruits and vegetables to users.

Keywords: *Kitchen, Refrigerator, Food, IoT, GSM, Data transmission, Wireless communication.*

I. INTRODUCTION

Designing smart equipment is critical to the realization of a smart home. Kitchen is an important place inside the home which consists of many advanced appliances which provide advanced services for a household. A smart refrigerator is the main focus of this research paper. This paper discusses efforts in developing a smart refrigerator to provide better services. The industry from time to time changes the traditional refrigerator function, i.e., to store food items in a cool environment, to combine fridge with TV, Mobile, computer & even connection to the Internet. These capabilities enable the development of applications for devices such as smart fridges. In this paper the main aim is to develop a smart refrigerator which focuses on better nutrition and health [1].

New inventions are the most important part of everyone's life in the present era. Home controlled with IoT devices such as Light, fan, AC, fridge & many more equipment of home. A refrigerator is the most widely used electrical device in the kitchen all over the world for keeping it fresh & storing food. Existing refrigerators can be modified into an advanced & cost-effective machine using a smart refrigerator module which consists of various sensors such as load cell, gas sensor, optical camera, GSM module, etc. Smart refrigerator looks at the nourishment status of food such as. Weight, quality, quantity, & freshness, etc. The main purpose of this work will be, to remove bad nutrient items, lessen sickness & make a smart refrigerator more beneficial [2].

In this present time, a human being deals with various technologies that are based on the internet of things (IoT). Smart devices with database capability are being used in today's human beings life. Everywhere it is noticed that there is up gradation with advanced technology, such as in, smart phones, appliances related to the kitchen & many more. Smart devices include washing machines, ac, television, fridge etc. Figure 1 shows the block diagram of smart refrigerator. One of the advanced technology of smart refrigerator which is used to store the food items. Refrigerators are used to prevent food from being spoiled & keep the food fresh, which reduces many diseases like illness, food poisoning & makes healthier lifestyle in the modern world. The proposed system based on IoT uses various electronics devices as the central server to make the refrigerator smarter [3].
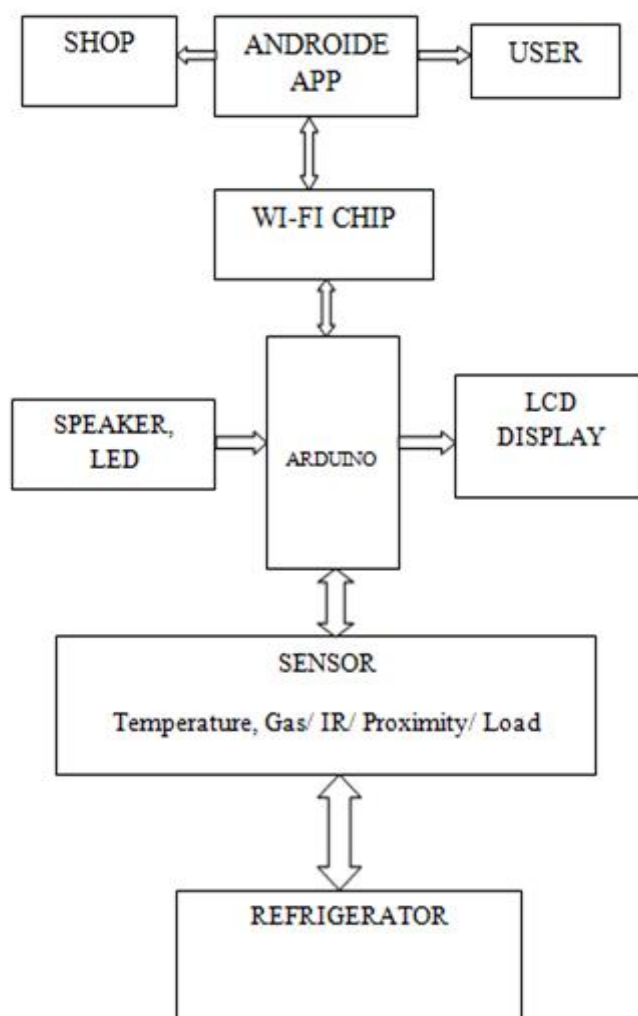
II.   SMART REFRIGERATOR DESIGN

Fig. 1 Block diagram of smart refrigerator

A refrigerator is daily use household equipment & it is the most widely used appliance within the house to store various food items & drinks. Advancement in technology has developed a great impact on kitchen room equipment. Refrigerators have made human living style more convenient in keeping food fresh & preventing food from spoilage. From many times there has not been too much advancement in the features of refrigerators, the basic function of refrigerators is to keep food items cool & users didn't prefer any additional features for which the cost of a product is increased but in recent times, advance refrigerators are developed which are not well known to every people. An advance refrigerator is one which has connectivity to the internet through the IoT where it can do lots of things other than just storing food cool [4].

Developing smart appliances is critical to the realization of a smart home. Kitchen is a prominent place in the home consisting of many intelligent appliances which aim to provide better services for a household. The focal point of our research is a smart fridge. In industry

and science, we have seen several attempts at creating smart fridges. The industry is trying to change the conventional purpose of the refrigerator, i.e. to store food products in a cool atmosphere, to combine refrigerators with TV, radio and computer capabilities, and even to connect to the Internet. These computer-like capabilities make it possible for devices such as smart fridges to create applications.

We plan to create a smart fridge in this project that focuses on better nutrition and wellbeing. It is a well-known fact that fast-paced growth and modern living have been achieved. The consequence was a change in the lifestyle of people towards less exercise and an unhealthy diet. If we do not take consuming nutritious food seriously, poor eating habits will cause diet-related illness in late life. In developing nations, for example, obesity resulting from unhealthy eating patterns and behaviors is becoming a major health danger. We believe that applications that concentrate on better nutrition and health are important in this context. This paper introduces an application that encourages healthier food and health behaviors directed towards the smart fridge. The fridge being a prominent appliance in the kitchen plays an important role in food and nutrition of a household and in our opinion is ideally suited for such an application.

With tremendous improvement in technology, all devices are connected to the internet which forms the internet of things. The sensors are used to capture the data and send it over the internet to a host where it is supposed to be processed. Improvements in technology have simplified our everyday lives. It has been made smarter by the innovations introduced using IoT in electrical appliances at home [5]. Smart refrigerators, which are used to store food products, are one of those inventions. Fridges are used to avoid food from being wasted and keep it healthy. It eliminates sickness and makes our lifestyle in the modern world healthier. Raspberry pi is used by the proposed IOT-based framework as the central server to make the fridge smarter. The load cell is used in an analogue form to find the weight of the food available, which is then fed into HX711 (an A to D converter) to obtain the digital weight [6].

Mobile devices such as tablets and smart phones are used by the intelligent home automation system to monitor the functioning of home appliances anywhere in the world through the internet via a protocol through which it can communicate with the user and make it interactive, the Smart Fridge is linked to the network. Mobile software has been developed to monitor the amount of stuff in the fridge. If the weight of the content determined by the load cell falls below the threshold value, the user will be informed by a mobile application that there is an urge to place an order by sending a request. The order may only be imposed by approving or refusing the request in the notice itself, which places an order automatically.

III.   CONCLUSION & DISCUSSION

The transformation of existing refrigerator to advanced & intelligent refrigerator is done using Arduino UNO & web server and the module detects the shortage of food items and notifies the user and uploads the information to web service along with information of refrigerator

temperature and humidity. This system is cost-effective and provides the user SMS notifying the shortage of food quantity present in the fridge & has the ability to order and notify shortage of food items online like egg, milk, butter & many more items or messages the nearby general store for the order to refill the items of quantity. Additionally it senses the nutrient value of items stored in the fridge, temperature, humidity & also displays expiry date of food stored in it.

IV.   REFERENCES

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