IoT Based Smart Refrigerator

Shalabh Gaur

Department of Electronics and Communication Engineering

Faculty of Engineering, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

ABSTRACT: Rapid development in technology tends to use advanced equipment in day to day life, one such advanced equipment is smart and intelligent refrigerators. The modular house kitchen and shops smart refrigerator plays an important role in storing food items. There is a requirement for a more effective & efficient way to observe the quantity of food items left for the forthcoming days as well as in case of shops it is also important to avail the required quantity to develop the business. This smart fridge is user-friendly and enhances human life. The features that can be provided are numerous and mobile or web application is designed to prior control the fridge and application act as a connection between fridge and user. The smart refrigerator senses the shortage of items in it and upon granting access orders the item online or messages the grocery store to deliver the items. The smart module monitors temperature, humidity and uploads to cloud platforms with real-time updates to the user.

KEYWORDS: Refrigerator, Internet of Thing, Sensor, Quantity, Quality, Intelligent system.

INTRODUCTION

In the present period, automation is the most important aspect of our lives. Home-accommodated automation helps us to monitor IoT devices such as lights, entryways, fans, AC, fridges, etc. A refrigerator is the most commonly used electrical appliance in the kitchen for preserving and keeping food fresh all over the world. Using a smart refrigerator module consisting of sensors such as load cell, gas sensor, camera module, etc., a basic refrigerator can be upgraded to a smart, cost-effective system. The smart refrigerator analyses food nutrition status for e.g. weight, quantity, consistency and freshness, etc. The importance of this work would be to eradicate rot sustenance, minimize disease and make people of current ages a more beneficial way of life. A human being is used in this modern age to deal with technology that we might claim as the Internet of things (IoT). In today's life, smart applications with hypermedia capabilities are being used [2]. We see enhancements to superior technology, such as cell phones, home appliances and much more, as we look around ourselves. Smart appliances include a washing machine, a TV, a fridge etc.

The Internet of Things paradigm (IOT) needs omnipresent access to billions of heterogeneous devices. In recent times, a wide variety of new services and applications have been envisaged by the rapid growth of IOT devices in the smart home environment. Kitchen is one of the most important areas for a Smart Home as it consists of many appliances that provide the household with better services. The smart fridge is the focal point of our project. Many attempts have been made to create a smart refrigerator, none of which has been energy-efficient or cost-effective. Modern living and fast-paced environments do not allow the consumer inside the refrigerator to keep track of food products.

Internet access is still weak at most locations and there is minimal connectivity to the network, i.e. either low internet speeds or low support. The barcode does not document the essentials of the product containing the expiry date in a uniform way. There's not enough protection for the smart home environment or the networked home to secure the data outflow from the building. Attackers will breach the privacy of the consumer and the house. For remote device use, there is no special operating system to manage the smart system. There is no standard for the region, resulting in goods conforming to different requirements by different producers. The smart refrigerator or the internet refrigerator as it is called because it is used to monitor the items inside it and notify about scarce products. Saving energy

when possible, providing ON-OFF control through mobile phone etc. The idea of connecting home appliances to the internet or the smart home environment has been seen as the future and is highly regarded as the next big thing [1].

More than two billion consumers worldwide use an internet connection today to browse content, send and receive information in the form of email or instant messages, access multiple multimedia services, and create social networks, among other items. In addition, the internet is supposed to also function as a global forum to allow new ways of working, communicating and living through the interconnection of physical objects or items [2].

LITERATURE REVIEW

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 [3].

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. This paper discusses the advanced refrigerator system because people are very advanced in the present lifestyle [4].

It is important for the realization of a smart home to build smart appliances. Kitchen is a popular home location consisting of several intelligent appliances aimed at providing a household with better facilities. 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 function of the refrigerator, i.e. storing food products in a cool atmosphere, incorporating the refrigerator with TV, radio and computer capabilities, and even connecting to the Internet. These computer-like capabilities allow the creation of applications for devices such as smart fridges. One of the advanced technologies is a smart 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.

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 advanced refrigerator is one which has connectivity to the internet through the IoT where it can do a lot of things other than just storing food cool.

Presently people are too busy with their work; they don't have time to remember how much daily required items are left in the refrigerator. The proposed designed system provides a facility that when vegetables or daily required items like eggs, milk & many more are less than predefined threshold value then the user will get a notification on their mobile application & user will place an order to the nearby shop his house & shopkeeper will deliver that particular product. 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 advanced refrigerator is one which has connectivity to the internet through the IoT where it can do a lot of things other than just storing food cool. 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.

CONCLUSION & DISCUSSION

People everyday life is made simpler by the Internet refrigerator, which is a typical IoT. Given the bright side and the growth this will bring to our everyday lives, in our habits, ease and comfort will be unavoidable. This affects or affects not just the customer or user, but food producers, food suppliers, manufacturers of the device (fridge) and even repairers or maintenance officers. It makes lifestyle simpler, fast and productive and of good quality for consumers, as menu can be easily prepared, short or no time is spent organizing items based on expiration, no food waste, more efficient shopping, etc. The possibility of the insightful fridge is obviously more coming to than educating the customer about the substance of the fridge. The smart refrigerator is conservative and easy to use.

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