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IoT Based Refrigerator Monitoring System

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ABSTRACT: The IOT refers to the set of devices and systems that interconnect real world sensors to the internet. These systems, including smart objects, smart monitoring devices, home automation systems and many more. This project deals with a smart refrigerator which is able to sense the quantity as well as quality of the food items kept inside it. It will be smart enough to notify the current status of food items through an email notification, and will also remind us about the items are going to spoilage before they actually get rotten. Thus it will save the money and food wastage as well as help us to live a healthier lifestyle. Smart Refrigerator is an appliance which converts an ordinary refrigerator into a smart refrigerator.

KEYWORDS: IOT, Data analysis, Refrigerator monitoring and Arduino NANO.

I.INTRODUCTION

The system and techniques described in this disclosure relate to a grocery management system. The grocery management system can be implemented for use in an Internet, an intranet, or another client and server environment. The system can be program instructions implemented locally on a user device or implemented across a client device and server environment. The user device can be any physical storage device, e.g., refrigerator, cooler, fridge, cold storage, or chiller. A network of things such as sensors, devices, embedded boards, computing resources, vehicles, systems connected with each other to inter-communicate using the Internet as medium. IOT has enabled communication and exchange of information among things and people in an easier way. All these connected things are called as Smart Objects. IOT has expanded its significance in all major spheres of our lives. Smart Home, Smart City, Smart Grid, Wearable's, Smart Retail and Logistics, Health Care, Smart Agriculture and Farming are evident use cases of the impact made by Internet of Things. All these applications brought a new value to our lives. Majority of challenges faced in the logistics sector are addressed by the required use of IOT. Newer developments in technologies with the incorporation of IOT shaped the future of logistics allowing businesses to expand and be flexible with changes in industry demands. Continuous tracking of logistics, remote tracking of logistics, asset monitoring, predictive asset monitoring, optimization of warehouse loads (inventory control), optimization of routes, vehicle management and fleet management collectively contribute to the deployment of Smart Logistics concept. In order to reduce the logistic expenses and avoid spoiling of goods during transportation, continuous and remote monitoring of temperature and humidity is essential in containers during transportation. A GUI helps in analyzing and supervising the essential parameters during food transportations. Depicts the industrial IOT eco system and its major applications made, none of which has been energy efficient or cost effective. Many efforts in the development of the smart refrigerator have been depicts the industrial IOT eco system and its major applications made, none of which has been energy efficient or cost effective.

II. EXISTING SYSTEM

The smart refrigerator system is capable of sensing as well as monitoring its contents. The smart refrigerator system is able to remotely notify the user about the scarce products via SMS An intelligent system which permits the user to efficiently manage and correctly locate the foods stored inside the fridge. By using the RFID technology, I-Fridge is able to robotically collect the food information, observe the user's activities and localize the specified foods. Cleaning of this device should be done very carefully Different blocks are maintained to keep particular type of food. System won't work properly in case of food block and food type is exchanged and trajectory search. The vision model confines

the robot universe into a set of situations occurring inside a look-ahead space 5-m wide and 8-m long at the height occupied by the vine canopy. Field experiments conducted in 2015 in a commercial vineyard showed stable behavior for low speed and revealed important sources of errors at higher speeds due to significant differences between vision-calculated angles and measured wheel angles. The Vine Robot project emerges.

III. PROPOSED SYSTEM

In this project, we propose smart refrigerator which leads to healthier lifestyle. Smart refrigerator is designed for managing food items stored in it and advising it user what type of food store inside the refrigerator. Here we discover the presence of the object by using load cell sensor, which is used for checking the weight of products of the container where objects are placed. It is always challenging to develop smart appliances while we appreciate about a smart home. A smart refrigerator is the main motivation while we talk about our research. We have seen much advancement while developing smart refrigerator in industry and research.

ARDUINO NANO

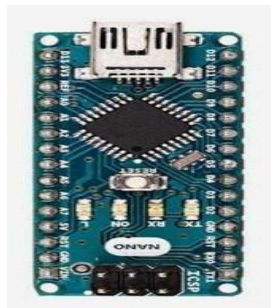


Figure.1. Arduino Nano

LM35 – Temperature Sensor

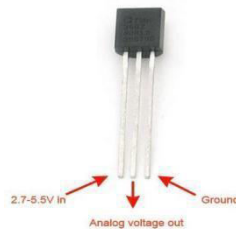


Figure.2. LM35-Temperature sensor

Useful in robotics application, bidirectional DC motor controller and stepper motor driver.

Gas Sensor



Figure.3. Gas Sensor

IV.SIMULATION RESULTS

The key outcome of the project is the achievement of accurate fertilizer dropping. The robot's servo motor- controlled fertilizer dispenser mechanism ensures precise placement and optimal contact, ultimately leading to improved germination rates and crop yield. Moreover, the integration of a sensor allows the robot to monitor the content in the soil effectively.

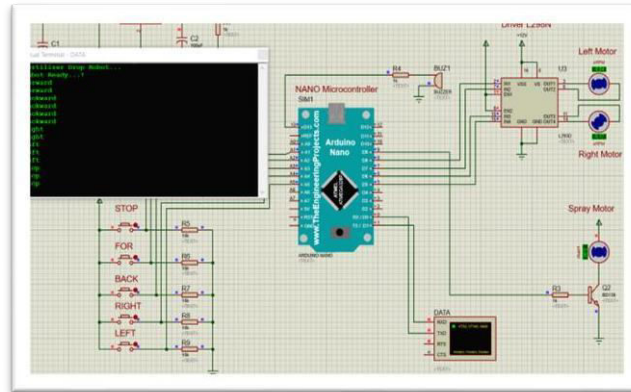


Figure.4. Simulation Result

The robot's ability to follow predefined paths accurately is critical for efficient seed sowing operations. The integration of a Bluetooth module facilitates wireless communication between the ag-robot and external devices such as smartphones or computers. This wireless control and monitoring capability allows users to remotely control the robot, send commands, and receive real-time data and feedback regarding the robot's operation and status. This feature provides convenience and flexibility for farmers and agricultural practitioners. The robot's servo motor-controlled fertilizer dispenser mechanism ensures precise placement and optimal contact, ultimately leading to improved germination rates and crop yield. Moreover, the integration of a sensor allows the robot to monitor the content in the soil effectively. The key outcome of the project is the achievement of accurate fertilizer dropping. The robot's servo motor-controlled fertilizer dispenser mechanism ensures precise placement and optimal contact, ultimately leading to improved germination rates and crop yield. Moreover, the integration of a sensor allows the robot to monitor the content in the soil effectively and receive real-time data and feedback regarding the robot's operation and status. This feature provides convenience and flexibility for farmers and agricultural practitioners.

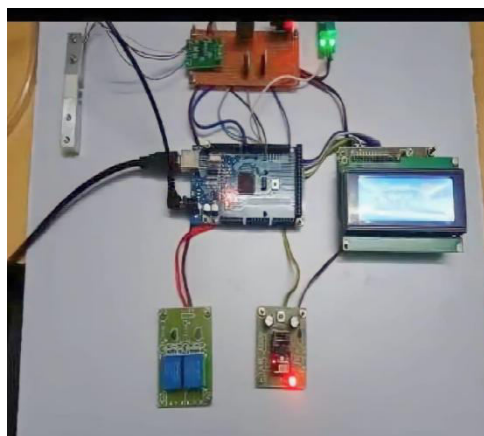


Figure.5. Implementation Model

V.CONCLUSION

The given concept of smart refrigerator is more reaching than notifying the user about the contents of the refrigerator. It should be give importance on maintaining a healthier and good lifestyle by providing the nutritional value of the contents. The future smart refrigerator can give market price of the product added in shopping list. The refrigerator of

the future would then be able to cross reference and act on reducing the ingredients used in future meal suggestions and helping to minimize food waste. the implementation of Smart Refrigerator Monitoring using IOT, encompassing features like refrigerator door status tracking and real-time quality and quantity monitoring, marks a significant stride towards enhancing the efficiency and user experience in the realm of food storage. By leveraging IOT technologies, this system provides users with unprecedented control and insights into their refrigerated goods. The ability to remotely monitor and manage the status of the refrigerator door.

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