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SMART IOT KITCHEN AUTOMATION AND GROCERY MANAGEMENT

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ABSTRACT: The use of Internet of Things (IoT) devices in the kitchen has revolutionised the way we manage our household tasks. Smart IoT kitchen automation and grocery management is a new technology that enables the automation of various kitchen appliances and provides efficient management of grocery inventory. This technology has the potential to transform the way we manage our homes and kitchens, offering a more efficient, automated and seamless experience. A key component in effective kitchen management is inventory control. Grocery management is managing the grocery items, which we have in our kitchen. This is done by keeping track of the grocery items in each container. In our kitchen, we have many grocery items in many forms like solids, liquids, or powders. Each item is stored separately in its respective container. This usage may vary for every day. If their level goes down, we have to buy we have to buy again and have to store. Grocery Management includes tracking their levels every day irrespective of the container and forms and indicating to us that this particular grocery level is low which you have to buy if their level goes down. In this hectic work schedule, people may not have the time in the world to check into the grocery levels. If they continue using the grocery items without checking into it, one day they will get emptied without their knowledge. At that time, it will affect the cooking process. The goal of this project can be concluded as when the entire kitchen will become a mess the project efficiently deals with the keeping track of the grocery items in order to effortlessly manage it.

KEYWORDS: Smart kitchen, IoT (Internet of Things), Automation Grocery management, Inventory tracking, Smart appliances

These keywords represent various aspects of smart IoT kitchen automation and grocery management. They can be used to explore and research related technologies, products, and solutions in this domain.

I. INTRODUCTION

Smart IoT kitchen automation and grocery management is a cutting-edge technology that allows you to manage your kitchen and grocery shopping in a more efficient and effective way. This technology also enables you to manage your grocery inventory with ease. By using smart sensors, you can monitor the stock of your groceries and get notifications when they are running low. You can also create shopping lists and order groceries directly from your phone, without leaving the comfort of your home. This technology is not only convenient but also cost-effective, as it can help reduce waste and save money on energy bills. A key component in effective kitchen management is inventory control. Grocery management is managing the grocery items, which we have in our kitchen. This is done by keeping track of the grocery items in each container. In our kitchen, we have many grocery items in many forms like solids, liquids, or powders. Each item is stored separately in its respective container. These grocery levels may fall depending upon our usage in daily life. This usage may vary for every day. If their level goes down, we have to buy we have to buy again and have to store. Grocery Management includes tracking their levels every day irrespective of the container and forms and indicating to us that this particular grocery level is low which you have to buy if their level goes down. In this hectic work schedule, people may not have the time in the world to check into the grocery levels. If they continue using the grocery items without checking into it, one day they will get emptied without their knowledge. At that time, it will affect the cooking process. If they are in the process of cooking, some dishes cannot be done without some grocery items. In that situation, they won't have the time to go to the grocery store to buy that one particular item in order to complete cooking. Finally, the entire kitchen will become a mess, which is why we have to keep track of the grocery items in order to manage it. This grocery management can also be done manually without any systems. For manual management, either we have to keep in memory, or we have to write it down. It may be better for homemakers, but for carrier people, it will be hard to notice and remember little things.

II. LITERATURE SURVEY

A social network is a set of people or groups of people with some patterns of contacts or interactions between them [?]. These interactions can be of friendship, business, scientific collaborations, or media among others. Formal analysis of these networks is called social network analysis. 1. "Designing an IOT based Kitchen Monitoring and Automation System for Gas and Fire Detection" 2022 6th International Conference on Computing Methodologies and Communication (ICCMC). Fire detecting system, PIR sensor, the Blink app. 2. "Cloud Based Smart Kitchen Automation and Monitoring" 2022 5th International Conference on Contemporary Computing and Informatics (IC3I) Merged Node MCUs with gas sensors, temperature sensors, MQ3 sensors, alarm systems, exhaust fans, and load cells, Mobile apps and integrated Node MCUs. 3. "Smart-Kitchen: Real Time Monitoring of Kitchen through IOT" 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM) Node MCU, organic led using the graphical user interface (GUI), wireless sensor

network (WSN). 4. "Smart Kitchen using IOT" s2023 International Conference on Artificial Intelligence and Smart Communication (AISC) MQ2(Gas) sensor, Pressure sensors, DHT11 sensors, IR sensor, cloud data transfer, Arduino Uno board, Protease. 5. IoT Applications on Secure Smart Shopping System. IEEE Internet of Things Journal, Volume:04, Issue:6, 2017, pp 1945-1954 Radio recurrence recognisable proof (RFID) tag. 6. Smart Shopping System Android Application. International Journal of Advanced Research in Computer Science and Software Engineering, Volume:06, Issue:11, 2016, pp 124-127. Utilises a framework containing the things connected with NFC tag. 7. Utilises a framework containing the things connected with NFC tag 4th Somaiya International Conference on Technology and Information Management, 2017, pp 44-49. They used the load cell to measure the grocery weight, Raspberry Pi microcontroller board which uses MQTT protocol.

III. METHODOLOGY

I'm sorry, but as a text-based AI model, I'm unable to create or display visual diagrams directly. However, I can provide you with a textual description of a possible diagram for smart IoT kitchen automation and grocery management.

Diagram Description:

The diagram consists of several interconnected components representing the smart IoT kitchen automation and grocery management system.

1. IoT Devices: This component includes various IoT devices such as smart appliances (oven, refrigerator, dishwasher), smart scales, barcode scanners, and temperature sensors. These devices are placed in the kitchen and communicate with each other and the central hub.

2. Central Hub: The central hub serves as the control system of the smart kitchen. It collects data from the IoT devices, processes the information, and triggers actions accordingly. The hub manages communication protocols, data storage, and automation algorithms.

3. Mobile App/Web Interface: This component represents the user interface for controlling and monitoring the smart kitchen system. Users can access the system through a mobile app or web-based dashboard. The interface allows them to view inventory status, generate shopping lists, manage recipes, and control appliances remotely.

4. Grocery Management System: This component represents the integration with a grocery management system or platform. It enables real-time inventory updates, online grocery ordering, and automated shopping list generation based on the smart kitchen's data. This integration streamlines grocery management and restocking processes.

5. Data Analytics: This component focuses on data collection and analysis. It encompasses mechanisms for capturing data related to inventory, usage patterns, expiration dates, and nutritional content. Analytical algorithms process this data to generate insights for efficient grocery management, meal planning, and automation.

6. Automation Rules: This component represents the rules and algorithms that govern automation in the smart kitchen. It includes rules for inventory tracking, expiration date notifications, recipe suggestions based on available ingredients, and energy-efficient control of appliances.

Please note that this description is a high-level representation of the components involved in a smart IoT kitchen

automation and grocery management system. The actual diagram can be more detailed and customised based on the specific requirements and architecture of your system.

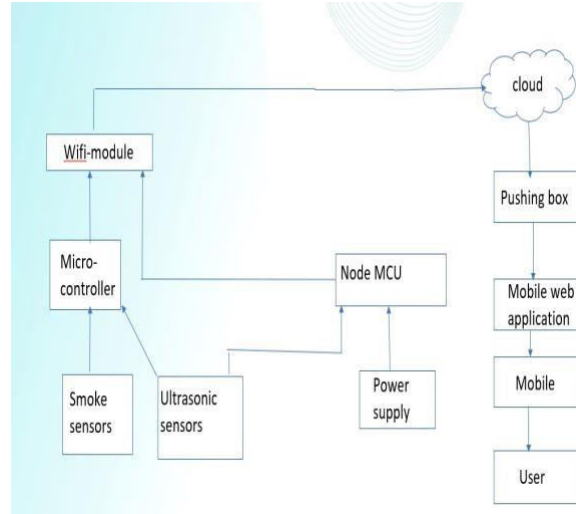
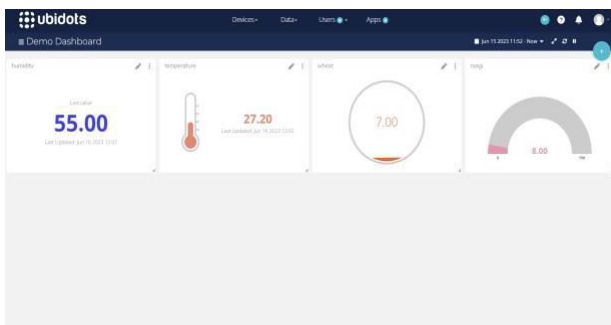


FIG1: BLOCK DIAGRAM

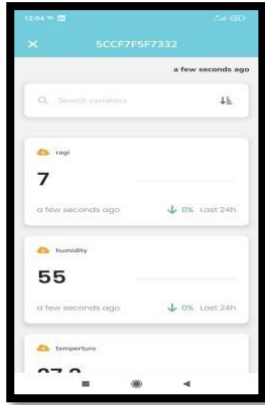
IV. RESULTS

In Smart Grocery Level Management System for Kitchen Automation we have used Ultrasonic Sensors in the lid of each container to find out the grocery level in it. These sensors are connected to the NodeMCU Board. By calculating the time difference between the transmitted signal the received signal from the Ultrasonic Sensor, the grocery level from the top of the container is measured. In that way we can find out the grocery level. The collected grocery information is stored in the cloud platform where analysis takes place and finally viewed by Android Application. The screenshots of various level measurements are given below. In grocery level management system two ultrasonic sensor are used. This measures the grocery levels of two separate containers. These fields give the sensors data separately.

V. CONCLUSION



In conclusion, smart IoT kitchen automation and grocery management systems have the potential to greatly enhance our daily lives by streamlining kitchen tasks and improving overall efficiency in managing groceries. These systems leverage the power of interconnected devices, data analytics, and artificial intelligence to create a seamless and intelligent kitchen experience. One of the key advantages of smart IoT kitchen automation is its ability to automate routine tasks. From controlling appliances such as ovens, refrigerators, and coffee makers to managing cooking timers and recipes, these systems make cooking and meal preparation more convenient and efficient. Users can control and monitor their kitchen appliances remotely, ensuring that meals



are ready on time and reducing the risk of accidents or overcooking. Additionally, smart IoT kitchen automation systems offer valuable insights through data analytics. By collecting and analysing data on cooking habits, ingredient usage, and meal preferences, these systems can provide personalised recommendations for recipes, meal plans, and even grocery shopping. This not only saves time but also helps users make informed decisions about their diet, nutrition, and food waste reduction.

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