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REAL TIME PANTRY INFORMATION SYSTEM USING IOT

NARSAIAH DOMALA[1], RADWAN JAMEEL[2], MOHAMMED YAMIN AHMED3, MOHAMMED MUJTABA AHMED4

[1]*Assistant Professor Department of ECE, Lords Institute of Engineering and Technology* Hyderabad, India
[2,3,4,5]*Department of ECE, Lords Institute of Engineering and Technology* Hyderabad, India

Abstract: The Smart Pantry using IoT is a cutting-edge solution aimed at reducing food waste and improving household food management. This system leverages the power of IoT technology to monitor the inventory of food items in a pantry and provide real-time information to users. The IoT devices are placed inside the pantry to track the quantity, expiration dates, and usage patterns of food items, which are then transmitted to a centralized database for analysis and storage. The system also provides a user-friendly interface that allows users to access their pantry information from anywhere and at any time. This information can be used for smart grocery shopping and meal planning, helping households save money and reduce food waste. The Smart Pantry using IoT is a practical solution that combines convenience and sustainability, making it a valuable addition to any household.

Key words: IoT technology

I. INTRODUCTION

The present project deals IOT technology in the hotel management area. The existing system working is very tedious process ordering to one person sending that with another person to ordering unit sending the same to the cashier. This total procedure will be build up by using embedded system with wireless technology. By using IOT technology we can reduce the man power in hotels and also it reduces the wastage time. Here we develop a system which interacts with the IOT application (Telegram) that provide a menu on the telegram bot to order an item, selected item will trigger the section to drop the item based on the order. The order details are presented to the user and payment requested is generated respectively after the selected is made. In this way we can speed up the servicing and attract the customer with a single application control over IOT.This project consists of 8-bit controller ESP8266 NodeMcu with wireless compatibility by using WIFI. Controller controls all the operations and display it on the LCD. Whenever the signal is received from the application it automatically the order from the food dispenser machine and remaining items are displayed on the display unit.

II. LITERATURESURVEY

The use of Internet of Things (IoT) technology in household pantry management has been gaining attention in recent years due to the increasing problem of food waste. A literature survey of the Smart Pantry using IoT reveals a growing body of research in this area.

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Studies have shown that traditional pantry management methods are often ineffective, leading to food waste and increased grocery expenses. The Smart Pantry using IoT offers a solution to this problem by using IoT devices to track the inventory of food items in real-time. This information can be used for better meal planning and grocery shopping, reducing food waste and saving money.

Several research articles have explored the technical aspects of implementing a Smart Pantry system. These studies have discussed the hardware and software components required, including IoT devices, sensors, and a centralized database. They have also considered issues such as data privacy and security, and have proposed various methods to ensure that the collected data is protected.

There have also been studies that have evaluated the effectiveness of the Smart Pantry using IoT. These studies have shown that households that have implemented the system have experienced a significant reduction in food waste and have saved money on groceries. Additionally, user satisfaction with the system has been high, with users reporting that the system is easy to use and provides valuable information about their pantry inventory.

In conclusion, the literature survey of the Smart Pantry using IoT reveals a growing body of research in this area, with a focus on technical implementation, effectiveness, and user satisfaction. The results of these studies suggest that the Smart Pantry using IoT is a practical and effective solution for reducing food waste and improving household food management.

III. WORKINGPRINCIPLE

The working principle of a chatbot operated Smart Pantry using IoT is based on the integration of IoT technology, chatbot technology, and pantry management. The system is designed to track the inventory of food items in a pantry in real-time and provide information to the user through a chatbot interface.

The Smart Pantry system consists of IoT devices, such as sensors and microcontrollers, that are placed inside the pantry to monitor the quantity, expiration dates, and usage patterns of food items. These devices collect data and transmit it to a centralized database for storage and analysis.

The chatbot interface is the main point of interaction between the user and the Smart Pantry system. Users can access information about their pantry inventory by sending text messages or voice commands to the chatbot. The chatbot uses natural language processing (NLP) and machine learning algorithms to understand and respond to user requests. For example, if a user wants to know the quantity of a particular food item in their pantry, they can ask the chatbot, and the chatbot will retrieve the information from the centralized database and provide an accurate response. If a user wants to add an item to their pantry, they can send a message to the chatbot, and the chatbot will update the database accordingly.

In this way, the chatbot operated Smart Pantry using IoT provides real-time information about the pantry inventory, making it easier for users to plan meals and grocery shopping, reducing food waste and saving money. The system is convenient, efficient, and sustainable, providing a practical solution for households looking to improve their food management.

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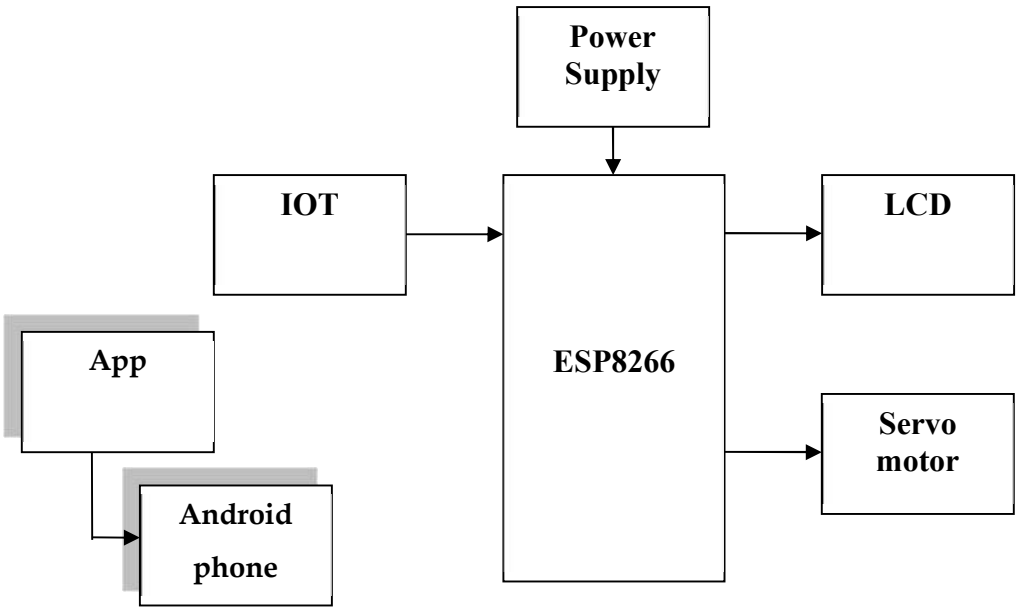
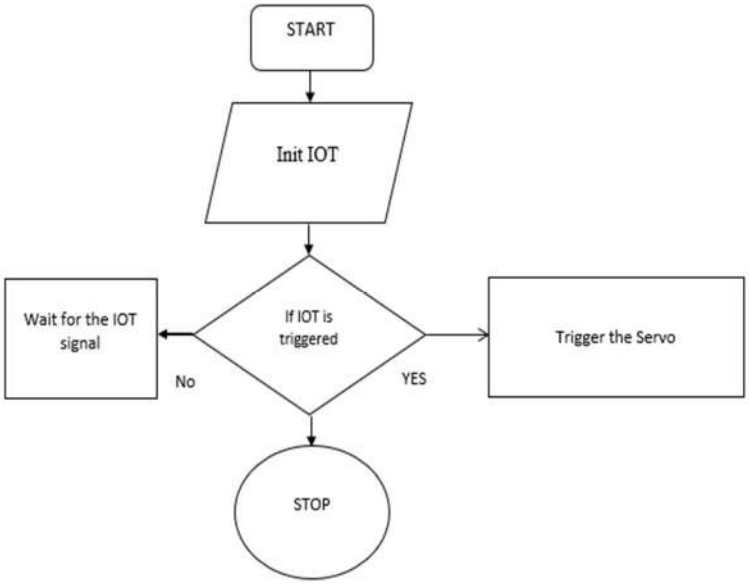
IV. BLOCKDIAGRAM



Block diagram of Real-Time Pantry Information system using IOT

V. FLOWCHART



Flow Chart of Real-Time Pantry Information system using IOT

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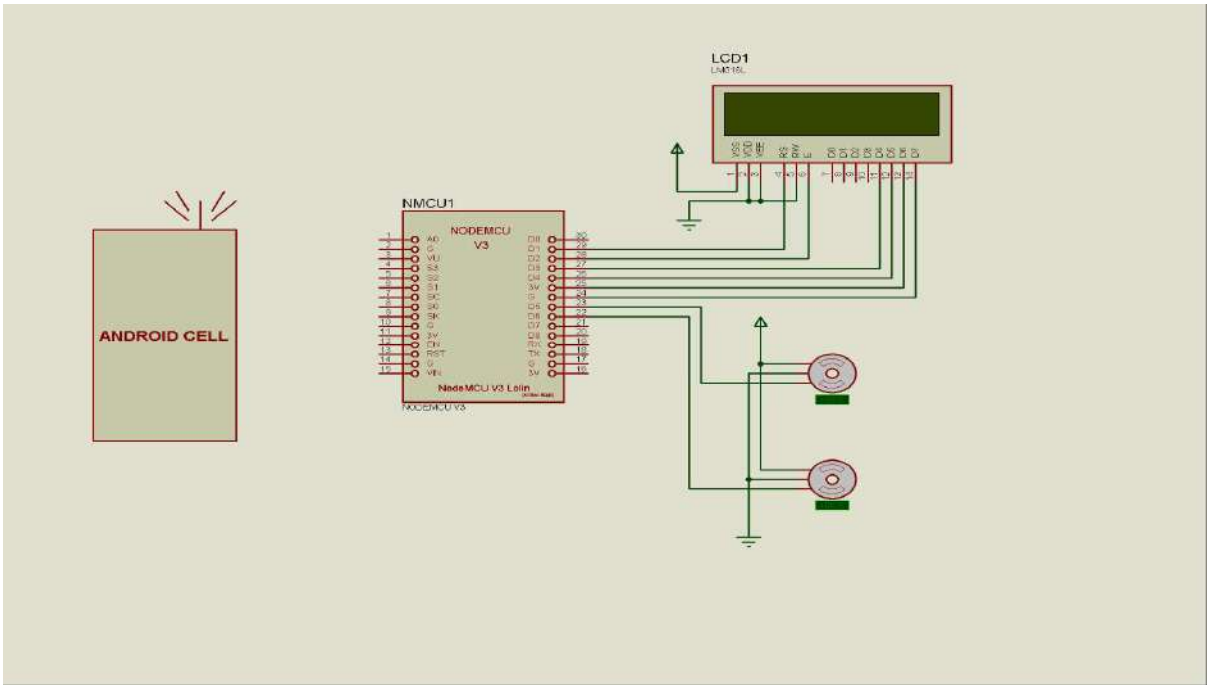
VI. SCHEMATICDIAGRAM:



Schematic Diagram of Real-Time Pantry Information system using IOT

VII. HARDWAREDESCRIPTION

c. *POWERSUPPLY*

The power supply section is the section which provides +5V for the components to work. ICLM7805 isused for providing a constant powerof+5V.

The ac voltage, typically 220V, is connected to a transformer, which steps down theac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also retains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator ICunits.

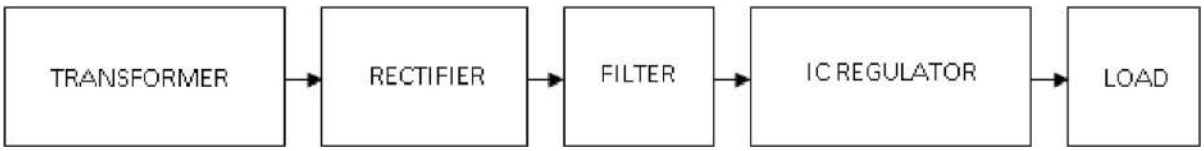


Figure3.1 Block Diagram of Power Supply

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d. MICROCONTROLLER

A Microcontroller (or MCU)is a computer-on-a-chip used to control electronic devices. It is a type of microprocessor emphasizing self-sufficiency and cost-effectiveness, in contrast to a general-purpose microprocessor(the kind used in aPC).A typical microcontroller contains all the memory and interfaces needed for a simple application, where as a general purpose microprocessor requires additional chips to provide these functions.

Amicrocontrollerisasingleintegratedcircuitwiththefollowingkeyfeatures:

- central processing unit - ranging from small and simple 8-bit processors to sophisticated32-or64-bitprocessors
- input/output interfaces such as serial ports
- RAM for data storage
- ROM, EEPROM or Flash memory for program storage
- Clock generator - often an oscillator for a quartz timing crystal, resonator or RC circuit Microcontrollers are inside many kinds of electronic equipment.

Theyarethevastmajorityofallprocessorchipssold.Over50%are"simple"controllers,andanother20%aremorespecializeddigitalsignalprocessors(DSPs)(ref?).Atypicalhomeinadeveloped country is likely to have only one or two general-purpose microprocessors but somewhere between one and two dozen microcontrollers. A typical mid-range vehicle has as many as 50 or more microcontrollers. They can also be found in almost any electrical device: washing machines, micro wave ovens, telephones etc.

C. c.LIQUID CRYSTAL DISPLAY (LCD)

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

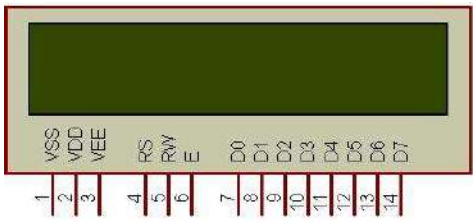

Fig. 16x2 LCD

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The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

LCD accepts two types of signals, one is data, and another is control. These signals are recognized by the LCD module from status of the RS pin. Now data can be read also from the LCD display, by pulling the R/W pin high. As soon as the E pin is pulsed, LCD display reads data at the falling edge of the pulse and executes it, same for the case of transmission.

LCD display takes a time of 39-43µS to place a character or execute a command. Except for clearing display and to seek cursor to home position it takes 1.53ms to 1.64ms. Any attempt to send any data before this interval may lead to failure to read data or execution of the current data in some devices. Some devices compensate the speed by storing the incoming data to some temporary registers.

e. SERVO (Motor)

Servos (also RC servos) are small, cheap, mass-produced servomotors or other actuators used for radio control and small-scale robotics.

Most servos are rotary actuators although other types are available. Linear actuators are sometimes used, although it is more common to use a rotary actuator with a bell crank and pushrod. Some types, originally used as sail winches for model yachting, can rotate continuously.

A typical servo consists of a small electric motor driving a train of reduction gears. A potentiometer is connected to the output shaft. Some simple electronics provide a closed-loop servomechanism.

Fig. Servo Motor

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VIII. RESULT & DISCUSSION

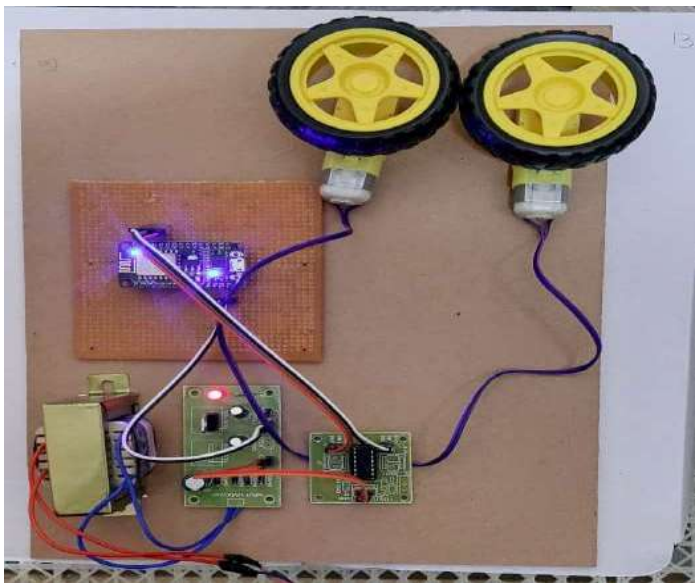

FIGURE:PHYSICAL SIDE

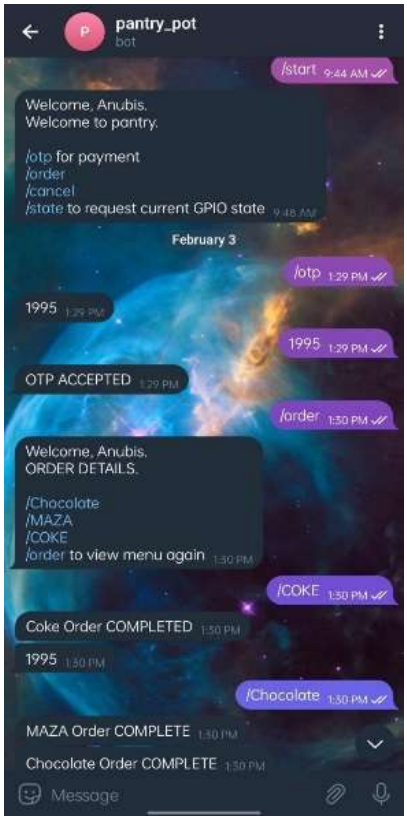

Figure: Chat Bot

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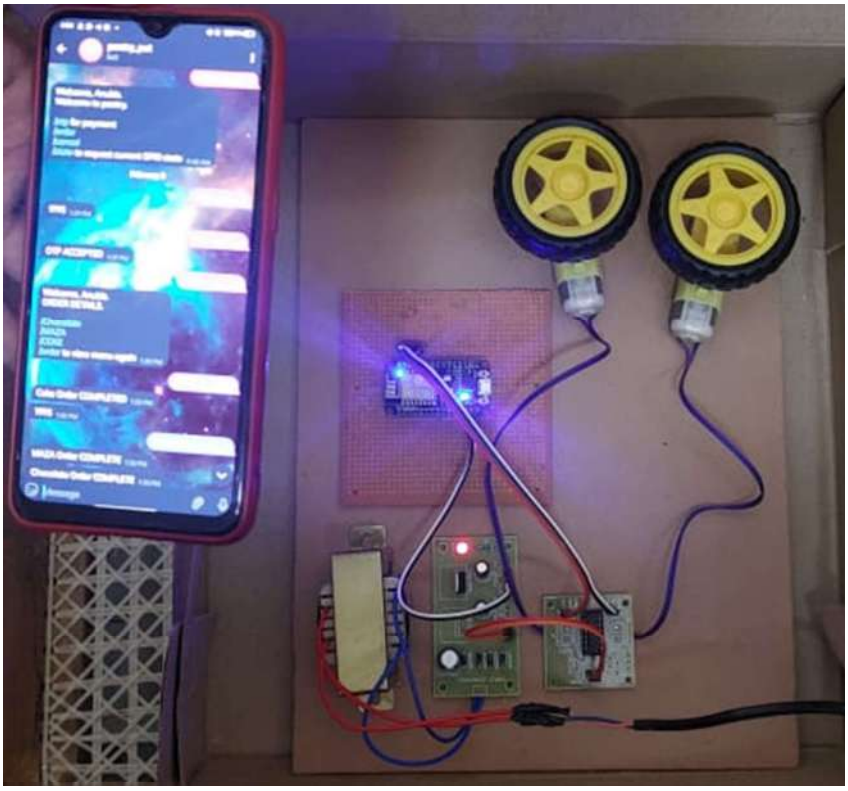

FIGURE7.4WORKING

IX. CONCLUSION

This paper **"Real-Time Pantry Information system using IOT"** has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly using highly advanced IC's and with the help of growing technology the project has been success fully implemented

X. REFRENCES

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