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## CLOUD BASED SMART PANTRY SYSTEM USING IOT

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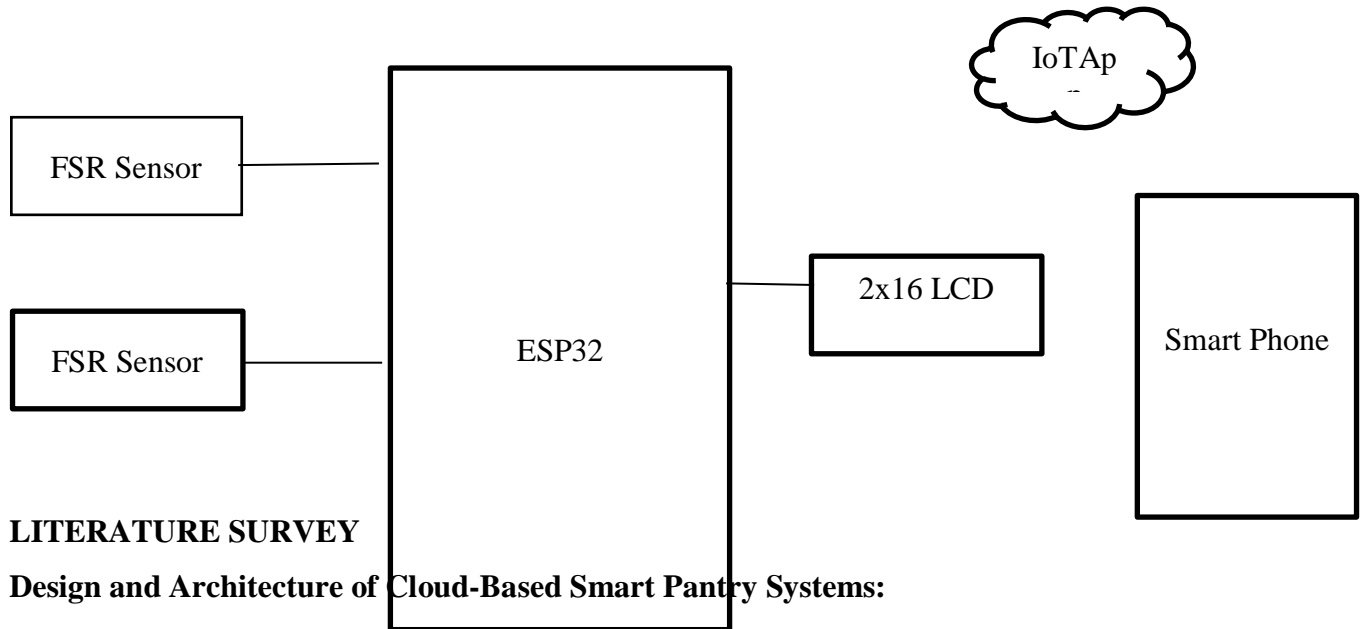
### ABSTRACT

The expansion of the IoT has allowed for the automation of several once manual processes. The system's primary objective is to facilitate the execution of routine culinary chores by people. Using the Internet of Things (IoT), this device monitors the level of a smart pantry. Sensors are attached to the containers. Use them to keep track of what's in the container and how much of each item there is. The cloud is where this data is stored after collection. All the time, the data is being refreshed. Weight fluctuations at regular periods are part of the data. A user may check the amount of objects in a container from anywhere using this approach. As soon as the container's level drops below the minimal weight, the user will get an alert. Additionally, it notifies the store owner to order a certain item.

### INTRODUCTION

The idea of the IoT Based Smart Pantry System permits the common person to keep the track of commodities in stock and additionally to apply the automation to retrieve the info of the items in a pantry. In this international of upcoming technologies, there are a few pantries that have used motor-pushed cabinets for the reason of gaining access to meals purely. But there isn't any device that might track each stock and automate the grocery gadgets retrieval. This undertaking proposed system has paved the manner such that it maps a few quantities of increasing educational territory of the patron's meals wastage through systematically reviewing the empirical research on meals waste practices in addition to distilling elements that foster and hinder the era of meals waste at the family degree and affords a higher technique to keep away from meals waste through right and good enough utilization of ingredients. Mapping the opportunities of the waste era has made us apprehend the family practices and additionally has helped to layout the automated kitchen pantry. To meet the necessities of

announcing, that your pantry will replicate your cooking style, this undertaking system has evolved the device of monitoring the supply of groceries and making orders in case of necessity. In that manner, preparing your pantry consistent with types of ingredients is a vital task, so you can be aware of things. Root groceries: millet, green gram, Bengal gram, black gram on the whole and also there are numerous groceries to be mentioned withinside the pantry and we can discover the real garage and the info amount of an object for a particular length and notify the one's info in chart illustration in Blink cloud.



### LITERATURE SURVEY

#### Design and Architecture of Cloud-Based Smart Pantry Systems:

Investigate research papers and articles that discuss the design principles and architecture of cloud-based smart pantry systems.

Look for studies that describe the integration of IoT devices, sensors, microcontrollers, communication protocols, cloud platforms, and user interfaces to enable smart functionalities such as inventory management, food tracking, and recipe suggestions.

#### IoT Devices and Sensors for Pantry Monitoring:

Review literature on IoT devices and sensors used in cloud-based smart pantry systems for monitoring food inventory.

Explore studies that discuss the deployment of RFID tags, barcode scanners, weight sensors, temperature sensors, and humidity sensors to track food items stored in the pantry.

#### Data Collection and Transmission:

Examine research papers and articles that discuss data collection and transmission mechanisms in cloud-based smart pantry systems.

Look for studies that describe how sensor data is collected, processed, and transmitted to cloud servers using wireless communication protocols such as Wi-Fi, Bluetooth, Zigbee, or MQTT.

#### Cloud Platforms for Data Storage and Processing:

Investigate literature on cloud platforms used for data storage and processing in smart pantry systems. Explore studies that discuss the integration of cloud services such as AWS (Amazon Web Services), Microsoft Azure, Google Cloud Platform, or IBM Cloud for storing pantry inventory data, analyzing consumption patterns, and generating personalized recommendations.

**Machine Learning and Predictive Analytics:**

Review research papers and articles that discuss the use of machine learning and predictive analytics in cloud-based smart pantry systems.

Look for studies that describe how machine learning algorithms are trained on historical pantry data to predict consumption patterns, suggest recipes, and optimize inventory management strategies.

**User Interface and Mobile Applications:**

Examine literature on the design of user interfaces and mobile applications for cloud-based smart pantry systems.

Look for studies that describe the development of mobile apps, web portals, or voice assistants to enable users to access pantry inventory data, receive alerts about expiring items, and place grocery orders from anywhere.

**Security and Privacy Considerations:**

Investigate literature on security and privacy considerations in cloud-based smart pantry systems. Look for studies that address concerns such as data encryption, access control, authentication mechanisms, and compliance with privacy regulations to protect user information stored in the cloud.

**PROPOSED SYSTEM**

The smart Pantry device can be used in households, Railway Pantry etc.. that is equipped with Force Sensitive Resistor to track the quantity of items in pantry.

Now, When an item is placed in a container which is attached to FSR, the whole circuit is triggered and the weight of the item will be displayed on LCD.

The Data is sent to the “Blynk IoT” app in the form of Analog values and weight of the item in Kilograms(Kgs).

Based on the weights obtained in app, we can identify which items were finished and which items were slow moving items and track them easily.

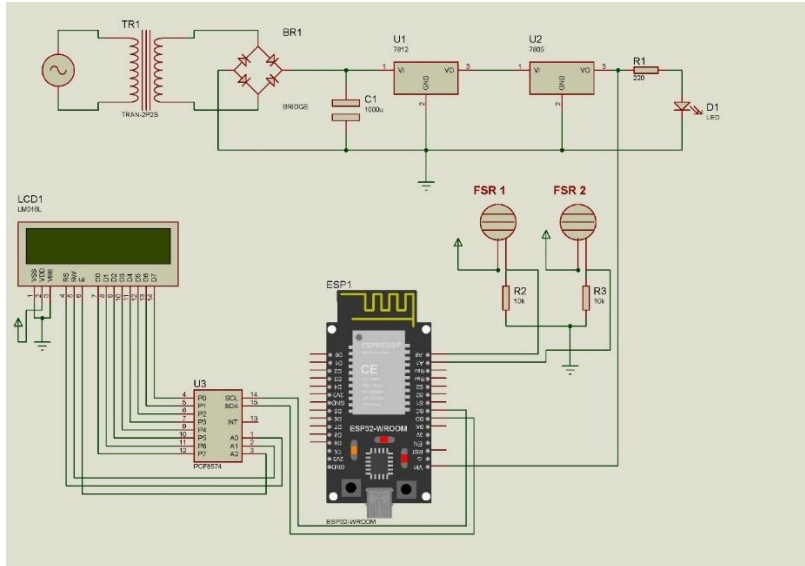


Figure.2 Schematic Diagram

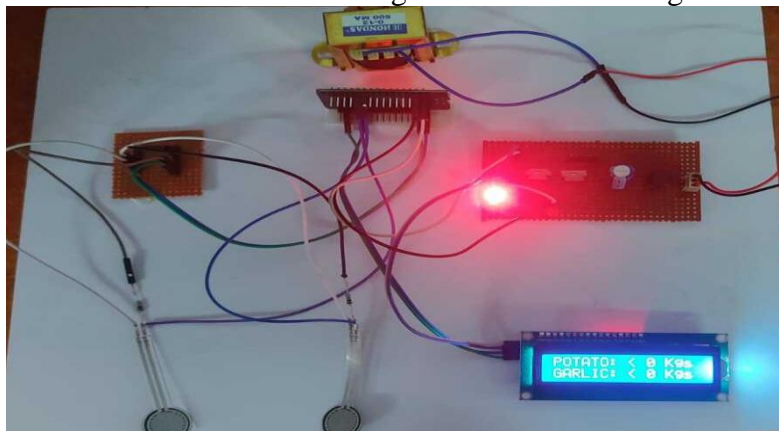


Figure.3 Working Kit

**RESULTS**

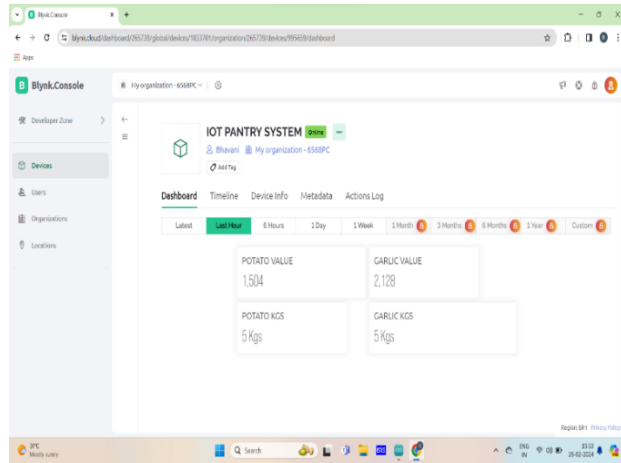


Figure.4 Displaying two FSR values on Blynk

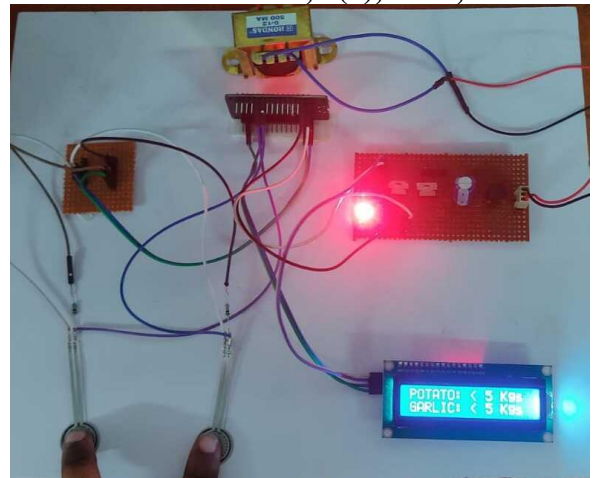
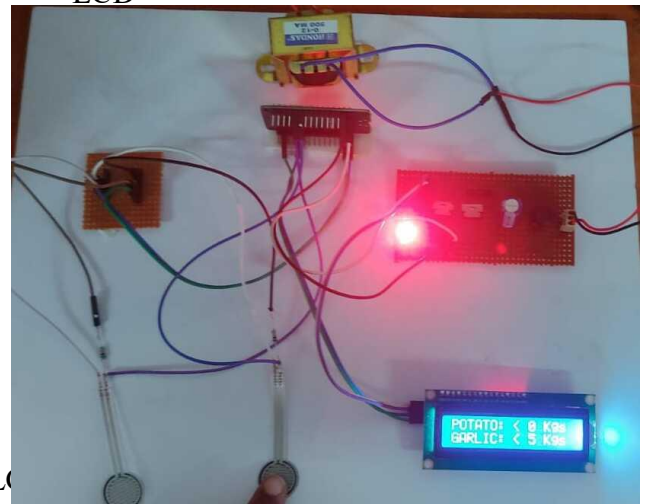
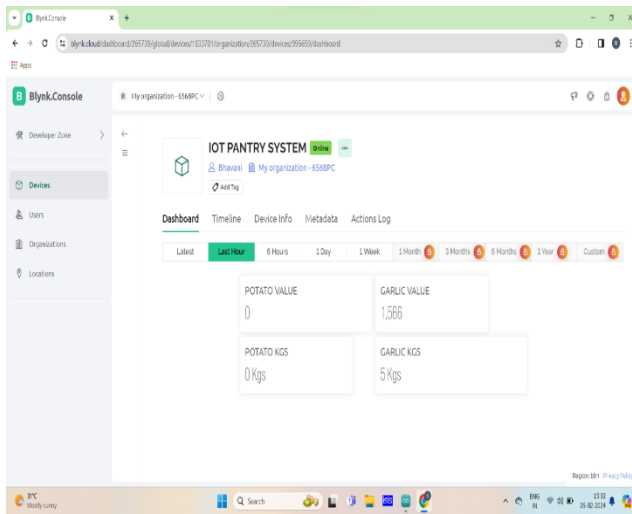


Figure.5 Displaying two FSR values on LCD



## APPLICATIONS

**Real-time tracking:** Monitor pantry contents in real-time, eliminating the need for manual checks and surprise empty shelves.

**Expiry alerts:** Receive notifications when items are nearing expiry, preventing food waste and saving money

**Demand forecasting:** In restaurants ,itanalyze inventory data to predict customer demand and improve product availability.

## ADVANTAGES

**Reduction in Food Waste:** By tracking expiration dates and consumption patterns, it prompts users to consume or donate food before it spoils, significantly reducing waste.

**Reduced food safety risks:** Monitor food temperatures and expiration dates to ensure food safety compliance.

**Cost savings:** Prevent food waste, optimize inventory levels, and reduce unnecessary purchases.

**Personalized experience:** Customized shopping lists, recipe suggestions, and targeted promotions.

**Personalised Recommendations:** Can offer personalized meal suggestions based on inventory, dietary preferences, and nutritional goals, enhancing the eating experience.

## **CONCLUSION**

To sum up, a major step forward in the administration of food supplies and kitchen inventory has been the creation and deployment of an IoT-based smart pantry system accessible via the cloud. By combining the capabilities of the internet of things (IoT) with cloud computing, this system provides a high-tech answer to the problems of inconveniencing consumers, wasting less food, and inefficiently managing stock. This method has many primary advantages. Firstly, it allows customers to remotely maintain tabs on their food supply via real-time monitoring and control of pantry products. As a result, you're less likely to waste food and save money by not purchasing too much or too little. Secondly, you can sync all of your devices with ease since the pantry inventory data is constantly available and up-to-date thanks to the connectivity with cloud services. People who shop for groceries as a family or a group will find this function quite useful. Integration with smart home appliances, online grocery delivery services, and meal planning apps are just a few examples of the new possibilities made possible by widespread use of this technology. With the help of these kinds of connections, a full-fledged kitchen ecosystem can be built, one that not only helps with inventory management but also with meal planning and preparation according to the users' specific dietary requirements. Overcoming obstacles connected to privacy, data security, and the initial setup cost is crucial for the general adoption of cloud-based smart pantry systems. For these systems to be successful, it is essential to create trust and ensure that user data is secure. The technology's accessibility and appeal among a wider audience will also be determined by how inexpensive and user-friendly it is. A futuristic method of managing one's kitchen and food supplies may be exemplified by an Internet of Things (IoT) smart pantry system hosted on the cloud. The Internet of Things (IoT) and cloud computing have the ability to revolutionise the way we do daily jobs, making them more efficient and less harmful to the environment. These systems have the potential to revolutionise our connection to food and kitchen management as they advance technologically and are more ingrained in our everyday lives.

## **FUTURE SCOPE**

While cloud-based smart pantry systems already offer a glimpse into the future of food management, future scope is vast and their potential extends far beyond just tracking inventory and suggesting recipes. Here are some exciting possibilities for the future scope of this project:

- Weight and image recognition: More sophisticated sensors could not only measure weight but also identify specific items visually, leading to even more precise inventory management and automated

tasks, like tracking expiration dates.

•AI and Machine Learning: Integrating AI and machine learning can personalize the experience further. The system could learn user preferences, suggest customized recipes, and optimize grocery lists based on dietary goals and health data.

## REFERENCES

- [1]Internet of Things (IoT),” What is the Internet of Things (IoT). [Online]. Available: [http://www.sas.com/en\\_/insights/big-data/internet-of-things.html](http://www.sas.com/en_/insights/big-data/internet-of-things.html).
- [3] Weber, R.H (2010). Internet of Things-New security and privacy challenges. Computer law & security review, 26(1), 23-30.
- [4] Haller, S. (2010). The things in the internet of things. Poster at the (IoT 2010). Tokyo, Japan, November, 5(8), 26-30.
- [5] Hong, S., Kim, D., Ha, M., Bae, S., Park, S.J., Jung, W., & Kim, J. E. (2010). SNAIL: an IP-based wireless sensor network approach to the internet of things. IEEE Wireless Communications, 17(6), 321-331.
- [6] IOT Based Pantry Management System by Dr. Prasanna, Rima Raj, Riya Saini, Snigdha Mishra, Surabhi Rakhecha
- [7] Karuppiah Pal Amutha, Chidambaram SethukaraiPitchiah, “Smart Kitchen Cabinet for Aware Home”, Smart 2012.
- [8] Sharmila Nath, Jayanta Kumar Nath and Kanak Chandra Sarma, IoT Based System for Continuous Measurement and Monitoring of temperature, Soil Moisture and Relative Humidity. International Journal of Electrical Engineering 7 Technology, 9(3), 2018, pp.106-113.
- [9] Snehal R. Shinde, A. H. Karode and Dr. S. R. Suralkar, Review on IoT Based Environment Monitoring System, International Journal of Electronics and Communication Engineering and Technology, 8(2), 2017, pp 37-42.
- [10] T Thamaraimanalan, SP Vivekk, G Satheeshkumar, P Saravana, (2018) “Smart garden monitoring system using IoT”, Asian Journal of Applied Science and Technology, Vol. 2, Issue 2, pp.186-192.