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COLD STORAGE CONTROL SYSTEM USING IOT

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Abstract ***—Cold storage is one of the important tools for many kinds of distributors, pharmaceuticals to connect with markets and to realize meaningful productivity. Due to lack of cold storages and lack of information about the current temperature in the cold storages, many distributors are unable to save their produce for future sellers, hence causing sharp price dips. A dearth of continuous electricity, absence of any warning systems, and the ratio of the wastage product will increases. A smart Iot connected device which acts as a data acquisition device and a controller serves the problem solution. The health status of the cold storage can be viewed using a web application or mobile application in almost real-time. The system detects risky scenarios and provides early warning notifications in critical conditions. In this technology advancement, everything requires monitoring and controlling. This paper proposes an Iot framework for facilitating food monitoring for protection of the food, so that it would not get contaminated due to surrounding conditions during storage. In present scenario, the work done is in terms of the sensed values that have been recorded and a detailed analysis has been performed but automated control alternatives are not present. The proposed solution analyzes temperature, moisture as these parameters affect nutritional values of food items and makes the analysis results accessible to the user via a web server. A web server is used for storage of data values sensed in real time and also for analysis results. User is alerted whenever an emergency occurs. In this solution, sensor for various domains is employed for sensing the condition of food. The data values with plotting of graphs have been done at remote location. So that this data can easily be used for further analysis and the user could be notified if a change in parameters values above a threshold is recorded.***

Keywords: *Real time monitoring; remote logging; nutritive value; web server; user alerts.*

I. INTRODUCTION

In the existing system allow temperature detection and auxiliary circuit to calculate the output and show it on LCD display. This work adopts wireless sensor network, ZigBee and research the performance and integrate mode of technologies. In the previous system it does not take any action quickly. There is an operator should always stay at the storage area to adjust the temperature of the cold storage area. So sometimes there is inaccuracy due to the system handle manually. They also lack sending of data through long distance due to their design. A system has been proposed to analyze the ambient conditions under which the food item is being stored. The proposed solution senses the temperature, moisture of surrounding environment as these parameters affect nutritional values of food items. The values of these parameters are then compared to standard values serving as threshold values for respective parameters. The data values with plotting of graphs has been done at remote location so that this data can easily be used for further analysis and the user could be notified if a change in parameters values above a threshold is recorded. A web server is used for storage of data values sensed in real time and analysis results. User, i.e. storage inventory manager is alerted. Web server is used to facilitate user interaction due to wide penetration of android devices.

II. OBJECTIVE

- To utilize Arduino Uno based tools and standard sensor for monitoring the cold storage.
- To have a centralized view on the production-consumption statistics.
- To improve occupancy rate in the storage by software driven stocking and dispatch planning.
- To scale down the food wastage effectively.
- To notify in real time and enable to take appropriate measures quickly.
- Alert or inform consumers about cold storage.
- The objective of the project also deals with the maintenance of the temperature.
- As the temperature goes low or high the controller detects the temperature and maintains the normal position.
- It can be used in the Ice industries to maintain the temperature.

III. SYSTEM DESIGN

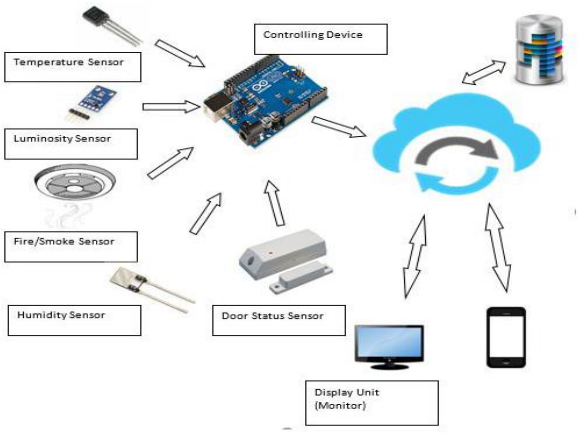

Figure 1: System Architecture

IV. WORKING

A storage facility should maintain the proper environmental conditions of the stored product. To maintain quality , improve he shelf life of the product and extend the marketing value or period of the product , the control of the temperature / environment conditions during the storage are very important is day to day life. For storing the food items in cold storage area the different kind of measurements are required to store the temperature, humidity and other factors in different parts of the cold storage to make the automation work effectively.

In industry, the storage is considered as the most important part. They are the major source for providing the food items or dairy product to the major industries by storing and preserving for long time. The monitoring system is very complex as well as expensive. In manual cold storage system the temperature adjustment and storage method depends upon the expert operator / assistant. The problem behind that is an operator should always stay at the cold storage area to adjust the temperature and manage the system. There is always a problem that the inaccuracy due to the manual monitoring system.

V. ADVANTAGES

1. The automation system will control the storage area and take the decision quickly on the current value or temperature. So there is no need an operator to always stay at the storage area.
2. To ensure a controlled environment, the proposed automation system is required to measure temperature accurately.
3. To utilize Arduino Uno based tools and standard sensors for monitoring the cold storage.
4. To have a centralized view on the production-consumption statistics.
5. To improve occupancy rate in the storages by software driven stocking and dispatch planning.
6. To scale down the food wastage effectively.
7. To notify in real time and enable to take appropriate measures quickly.
8. Any non-technical person can handle the whole system easily

VI. APPLICATION

1. It is used in to store medical inventory.
2. It is used to store dairy products like ice-cream, milk etc.
3. It is used to store products in D-mart for long time period.
4. It is used to preserving the crop yield or agricultural yields for a longer period.

Going further, most of the units can be embedded within the controller such as Web Application, with change in technology thereby improving the detection system. Can be implemented in Real time environmental conditions within

cold storage, hence life of Food products is extended for a longer period Can be made Easy accessibility for the cold storage using IOT.

The above said objectives are achieved through the development of the current invention that can monitor the status of cold storage. The current invention can be viewed as both product and tool. As a product, it can be a part of the market where people can buy it. As a tool, it can be integrated with storage devices like cold storages and can be part of manufacturing process of such products.

VII. CONCLUSION

The system aims is to establish monitoring and controlling platform in the food storage system and to find the more suitable wireless network for the food storage system. The Central monitoring unit can receive the monitoring data of sensor units and stores them in the database, and also can call and print that at any time. Both wireless standards have their own applications, advantages and drawbacks depending on the parameters. The proposed implementation shows that wireless sensor network offers low power consumption and high range as compare to the network based on Bluetooth. It can be concluded that for the food storage system implementation is more suitable than Bluetooth. Monitoring nodes consisting of sensors are the leaf nodes of the network, mainly responsible to collect data such as temperature and other environmental factors that help prevent food stuffs and food grains from perishing or decaying. All these nodes pass vital environmental information obtained from different sensors to a Central node via wireless communication. The Central node is responsible for passing the information to Management node. The Central node is replicated using Android application based cell phone and the Management node is replicated using Laptop, which makes it perfect client-server architecture.

VIII.ACKNOWLEDGEMENT

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