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IOT BASED SUPPLY CHAIN MANAGEMENT SYSTEM

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ABSTRACT

- The IoT-based Supply Chain Management System is a comprehensive solution aimed at effectively addressing the challenges of missing or replaced products within packages.
- The web app and mobile app interfaces provide users/admin with access to real-time package status, alerts, and data visualization. Using these data businesses can optimize supply chain processes and make informed decisions.
- This project offers a solution for addressing missing or replaced products in packages. Through the utilization of LDR and ultrasonic sensors, real-time monitoring, and a user-friendly interface, businesses can enhance supply chain visibility, streamline operations, and ensure customer satisfaction.



INTRODUCTION

1. In this technological era there are many sensors which can be combined together for proper management of supply chain to ensure safe delivery of product.
2. This system will find the data on every 1 min between every warehouse and if there is any missing product or try to replace activity found then according to that will provide the data or alarm to the organization members.
3. The proposed system uses different sensors like LDR sensor, Ultrasonic sensor and led light in the deployment of this project.



LITERATURE SURVEY

- Literature Survey: A thorough literature survey was conducted to gather insights from previous research on automated Supply Chain.
- Key Findings: Studies highlighted the significance of Discusses the application of analytics in real-time insights, predictive analytics, and decision-making, An automated Supply Chain Management (SCM) System includes the real-time GPS position tracking of transport fleets as well as a RFID based shipment tracking at the entry and exit point of the warehouse.

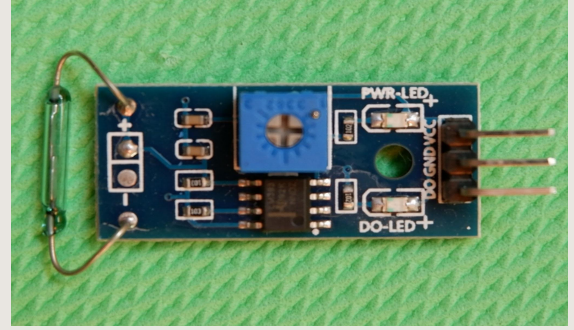


PROBLEM STATEMENT

- The problem statement for the IoT-based supply chain management system is to address the challenges associated with tracking and monitoring packages throughout the supply chain process.
- The primary focus is on detecting missing or replaced items within a package and providing real-time alerts to ensure the integrity and security of the supply chain.



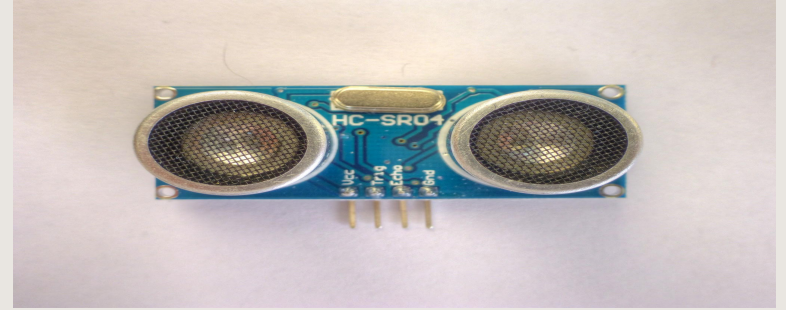
LDR SENSOR



- LDR (Light Dependent Resistor), also known as a photoresistor, is a passive electronic component that exhibits a change in resistance based on the intensity of incident light. It is widely used in various applications that require light sensing capabilities.
- The LDR sensor consists of a semiconductor material that exhibits high resistance in the absence of light and decreases its resistance when exposed to light. This change in resistance is attributed to the interaction between photons and the semiconductor material.



ULTRASONIC SENSOR



- Ultrasonic sensors are devices that use sound waves at frequencies higher than the human audible range to detect objects and measure distances. They work based on the principle of echolocation, similar to how bats navigate in the dark.
- Ultrasonic sensors emit high-frequency sound waves and measure the time it takes for the sound waves to bounce back after hitting an object. This information is then used to determine the distance between the sensor and the object.



METHODOLOGY

The IoT-based Supply Chain Management System with LDR and Ultrasonic Sensors works through a series of interconnected components and data flow. Here is a high-level overview of how the system functions:

1. **Sensor Data Collection:** LDR (Light Dependent Resistor) and ultrasonic sensors are deployed within the supply chain environment. The LDR sensor detects ambient light levels, while the ultrasonic sensor measures distances to objects or packages. These sensors capture data in real-time and send it to the microcontroller board (NodeMCU).
2. **Microcontroller and Sensor Integration:** The NodeMCU, equipped with the necessary circuitry and connectivity options, receives the sensor data. It processes and packages the collected data for transmission to the IoT platform.



3. **IoT Platform Integration:** The NodeMCU connects to the IoT platform via communication protocols. It securely transmits the sensor data to the platform, where it is stored and made accessible for further processing.

4. **Web and Mobile App Connectivity:** The IoT platform interfaces with a web-based application and a mobile application. Supply chain managers and stakeholders can access these applications to monitor the system, receive alerts, and take necessary actions.

5. **User Interface and Notifications:** The mobile application allows stakeholders to access the system on the go, receive notifications, and respond to alerts promptly. So for notification warning there are two cases, One is when light is detected by any one of two LDR sensors and Second is when distance is greater than the set threshold value. If any of these two cases happens then notification and email will be sent.



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