IOT Based Coldchain Monitoring System

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Abstract:
This paper presents the development of a new technology which has the ability to monitor the perishable good carrying vehicles for eg. Ice- cream carrier vehicles, vaccine transportation based vehicle by a trending technology called IoT. In this paper, using IoT(Internet Of Things) we have designed a project which will detect the environmental parameters such as temperature, humidity inside the cabinet ofvehicle carrying such items and in case of temperature rise above the reference it will send alert on the dashboard of the monitoringperson or the owner of the cold chain fleets through GSM. Also location where problem is arrived will be sent through GPS.

Keywords: Humidity, temperature, cabinet, perishable, GSM

Introduction:
The demand for cold chain management has been increased drastically due to perishable items gets damaged due to not maintaining the temperature inside the cabinet due to numerous issues like engine failure, door remains open etc.

Hence this paper revolves around IoT technology which will monitor all the parameters such as temperature, humidity, door status and decision making will be done by means of Arduino microcontroller.

In summary, this paper presents a novel approach to do the monitoring of cold chain fleets using IoT . The project offers a more efficient and cost-effective solution for delivery companies to maintain the temperature and freshness of items during transportation. The use of this technology has the potential to revolutionize the cold chain management and contribute towardsa more sustainable future

ProposedProject Work:

We are proposing a system which will help to counterfeit cold chain management and delivery issues at portable scale. The proposedprojectistodesignandbuildasystemwhichwilltake Environmental parameters inside the cabinet of the vehicle such as temperature and humidity through DHT22 sensor, door status by mean so fin frared sensor,locationtrackingbyusingGPSNEO6M module and internet connectivity using GSMand cloud storageas blynk IOT cloud platform. The first step in the project will be to determine the size and dimensions of the hardware. This will be based on the intended use, as well as the amount of items to be transported. This has been designed and constructed; it will undergo thorough testing to ensure that it meets the desired specifications. This will involve testing its cooling efficiency, power consumption, and overall durability.

System Architecture:
The system is divided into given sections:

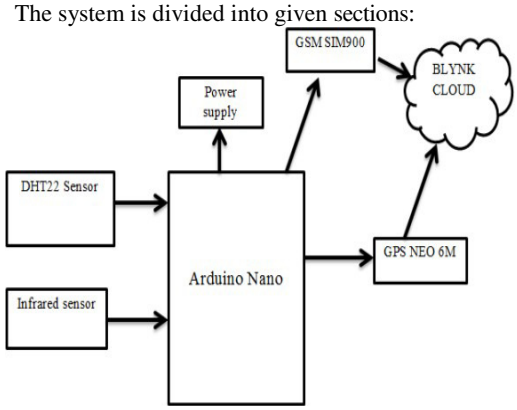

Fig:Systemarchitecture

Stage 1: In the first stage, Arduino Nano is assemble to receive parameters from DHT22 sensor and infrared sensor

Stage 2: In the second stage, the hardware components are assembled..

Stage 3: In the third stage, the arduino is programmed to control the system. The Arduino nano can be programmed using the Arduino IDE and can be connected to the DHT22,IR sensor and other components and control circuit via GSM.

Stage 4: In thefourth stage,the systemis testedand optimizedfor efficiency and performance. The arduino can be used to monitor the temperature of the two surfaces,

Overall, the system architecture of the system with Arduino involves the design and assembly of hardware components, programming of the arduino for control and monitoring, and

testing and optimization for efficiency and performance.

Advantages:

1. Costeffective solution.
2. Precise temperature monitoring: The system offers precise temperature monitoring with the range of -55 to 125 degree C range.
3. Easy to use: The combinedsystem is easyto use, witha simpleinterfaceformonitoringthestatusofthevehicle.
4. Low maintenance.
5. Compact design: The combined system has a compact design, making it suitable for small spaces, and easy to move if required.
6. Quietoperation:Thecombinedsystemoperatessilently, without producing any noise or vibration, making itideal for applications that require low noise levels.

Applications:

1. Food and Beverage industry: The system can be used to keep food items at a specific temperature range for extended periods, which is essential for food preservation.
2. Medical and Pharmaceutical industry: The system is ideal for maintaining temperature-sensitive products such as vaccines, medicines, and blood products.
3. Research and Development: The system is suitable for laboratories and research centers where temperature-sensitive experiments are carried out.
4. Environmental Testing: The system can be used for environmental testing, such as simulating hot and cold temperatures to test the durability of materials and products.
5. AgricultureandHorticulture:The systemcan beusedin agriculture and horticulture for the preservation ofseeds, plants, and vegetables, which require specific temperature ranges for storage.

Conclusion:

In conclusion, this system provides automation in tracking of the vehicle in a cold chain fleet at a remote location. Also this will help to resolve the problem of quality degradation in the cold chain monitoring using IoT technology and trending cloud platform like Blynk.

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