Temperature Monitoring and Alert System using Bolt IoT and Telegram

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ABSTRACT

With recent development in technology the world is moving in a faster pace. Temperature though has always played a very vital role in day to day life. Technologies improvements in fields such as the pharmaceuticals and indoor farming, have made the monitoring of temperature [1] a vital part of their day to day running. Temperature monitoring and other factors are essential to ensure that the goods are kept in appropriate conditions. This project aims to ensure that even the lowest people in the chain have the capability to match up the higher business standards. The project uses a Bolt IoT board with the LM35 sensor to pickup the temperature. The temperature will be monitored through this setup, in case any fluctuation occurs then the user will be alerted via the telegram monitoring app to ensure that they can handle the changes in the system.

1. INTRODUCTION

As explained in the abstract temperature plays a very vital role in day to day life. The varying temperature in an environment can Example a person running a pharmacy has to ensure that some medicines have to be kept at certain temperatures at all times to ensure that they don't go bad, this brings up the concern that the system can go down at any time. Systems are very susceptible to small changes. Example a power cut can put a big wrench in the management system.

Hence a monitoring and alert system is very necessary in order to ensure the smooth running of the systems. Some systems even come with a built control application that can fix the problem. Newer technologies such as thermostat etcetera have been inbuilt with such applications so that they can modulate the temperature with no human interference at all.

1.1 Motivation

The main reason for making this project is to create a modular program and device that can allow us to create a cost-effective way of monitoring and alerting the user about the temperature fluctuations. This low-cost module will allow low level pharmacies to ensure that the temperature is monitored constantly without the need of human interference. Whenever a temperature fluctuation occurs in the system the user will be alerted about it. In addition to this there has been an attempt to predict a future failure. This prediction chart uses previous failures and the mean time between them to predict a future failure rate.

1.2 Literature Review

[2]In this paper the author writes about the creation of a temperature monitoring system which is accurate and will display the resultant temperature on a screen for further usage. The paper mainly focuses on validating the accuracy of the temperature detected and its usage. The resultant product is a system that can accurately detect and transmit the right temperature data to the system, this is useful where systems need accurate temperature data to make sure that the stored goods don't go bad due to temperature fluctuations.

2. REQUIREMENTS

This project contains both hardware and software requirements.

Hardware requirements –
- Bolt IoT wireless board
- Jumper Cables
- Bread Board
- [3]LM35 Sensor

Software Requirements –
- Anaconda
- Python 3.9
- Bolt IoT Application for mobile and pc

3. PROPOSED SYSTEM

Since the project aims to scale down a large temperature monitoring system and make it more affordable to the end user, the main components we use are the Bolt IoT wireless board and the temperature sensor.   The overview of the architecture – The main handling of all the data and calls is done by the Bolt IoT wireless board. The LM35 temperature sensor detects the temperature and forwards it the board. The board then compares it with the specified range given. If the temperature exceeds the range either by going above or below the given range,

then the system sends an alert to the user using the Telegram messaging API. The user can then make use of this data and decide if he has to interfere in the system and make changes in the internal temperatures.
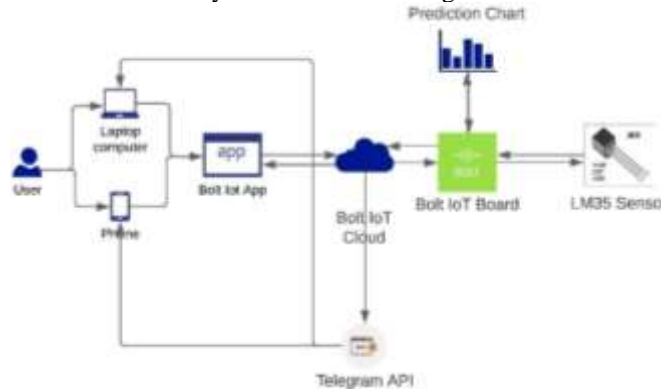

Fig 1.1 Architecture of the system

The Flow of Control in the System- The main and central hub of the system is the Bolt IoT board which handles all the detection and comparing and the calling of the API. The Bolt IoT board sends a signal to the LM35 sensor to start acquiring the data. The LM35 sensor then collects data every couple of seconds and sends it back the Bolt IoT board. The Bolt IoT board then forwards the data to the Bolt IoT cloud and uses the new dataset to create a prediction chart for predicting future fluctuations in temperature [4]. In case of any fluctuation in the system the board calls the telegram API. It then instructs the API to send a predefined message to the user about the fluctuation of temperature in the system. The alert will then be sent to user and they can then handle the fluctuations. The Bolt IoT board also sends an signal to the in built alarm unit to sound an small alarm to alert the user if he is in the vicinity.
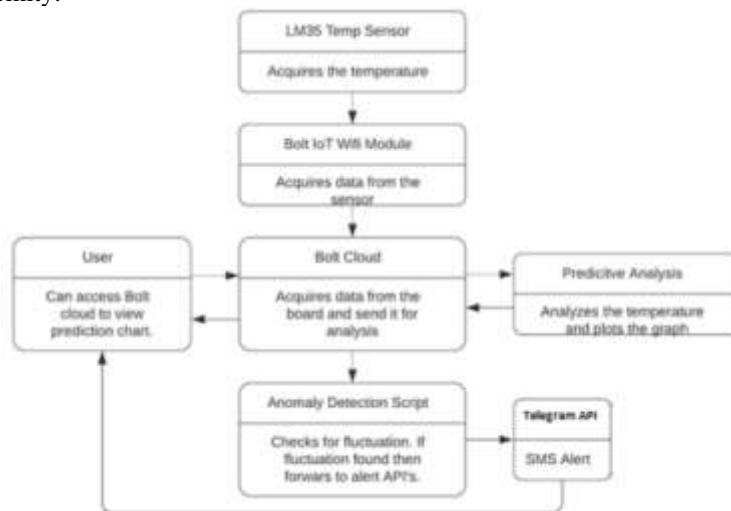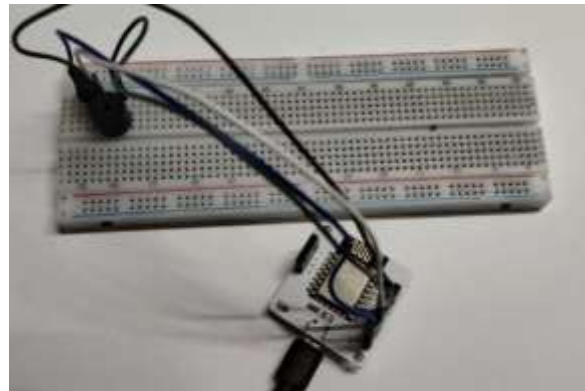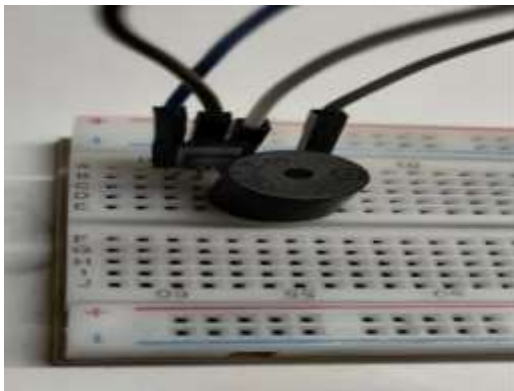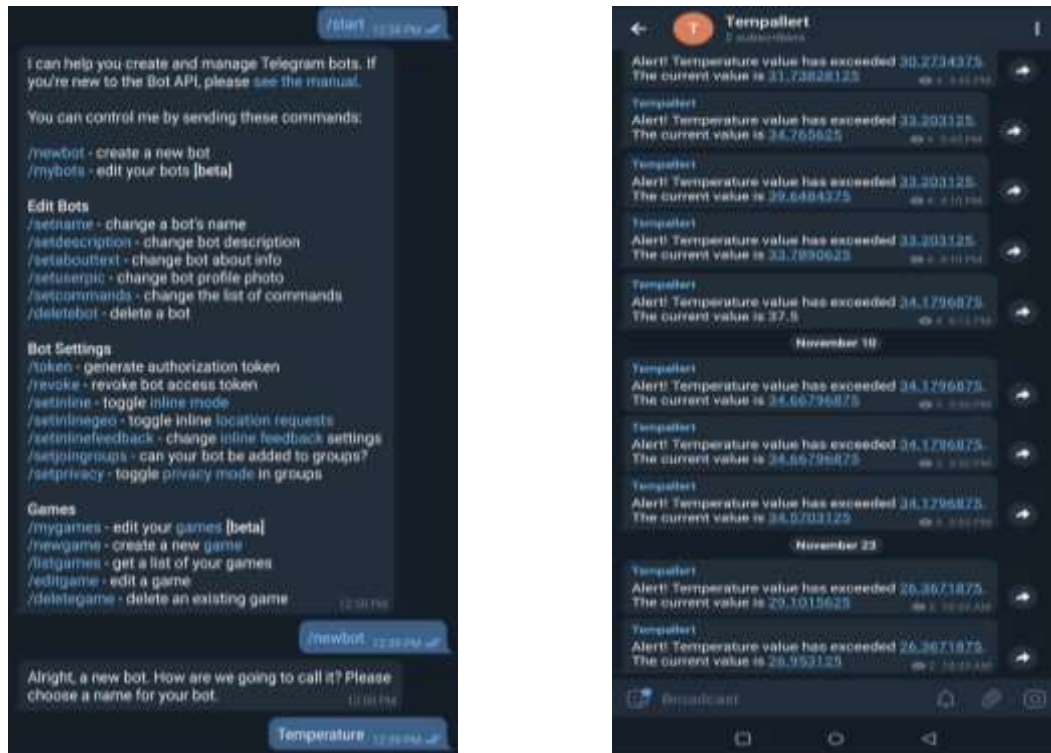

Fig 1.2 Flow of Control in the System

4. RESULT

5. CONCLUSION

The project successfully created a working low-cost module. This low-cost module will help small scale pharmacists to keep track of temperatures and help them to manage their systems better.

6. REFERENCES

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