Project - Smart Agriculture System

Implementing Smart Agriculture System using Raspberry Pi

Overview

• In earlier existing smart farming, there are some limitations in the automation.

• The main disadvantage of using Bluetooth or WIFI module is that it can able to retrieve information for the user at a certain distance.

• So, to overcome this problem in our project we have introduced IoT i.e., Internet of Things). IoT works based on the internet, it can able to send and receive data via network.

• Added to this automation we have included the MQTT Protocol.

• Reason is user can able to retrieve information with a low generation data network.

Methodology

• A lightweight protocol MQTT is used for data transfer between constrained devices and it keeps bandwidth requirements to an absolute minimum.

• Automatic Watering of plants is done with the help of Moisture

Sensor.

• Data collected from DHT sensor is transferred via MQTT Protocol.

Hardware Requirements

• *Raspberry pi*

• *Temperature and humidity sensor*

• *Moisture Sensor*

• *Water pump*

• *Buzzer*

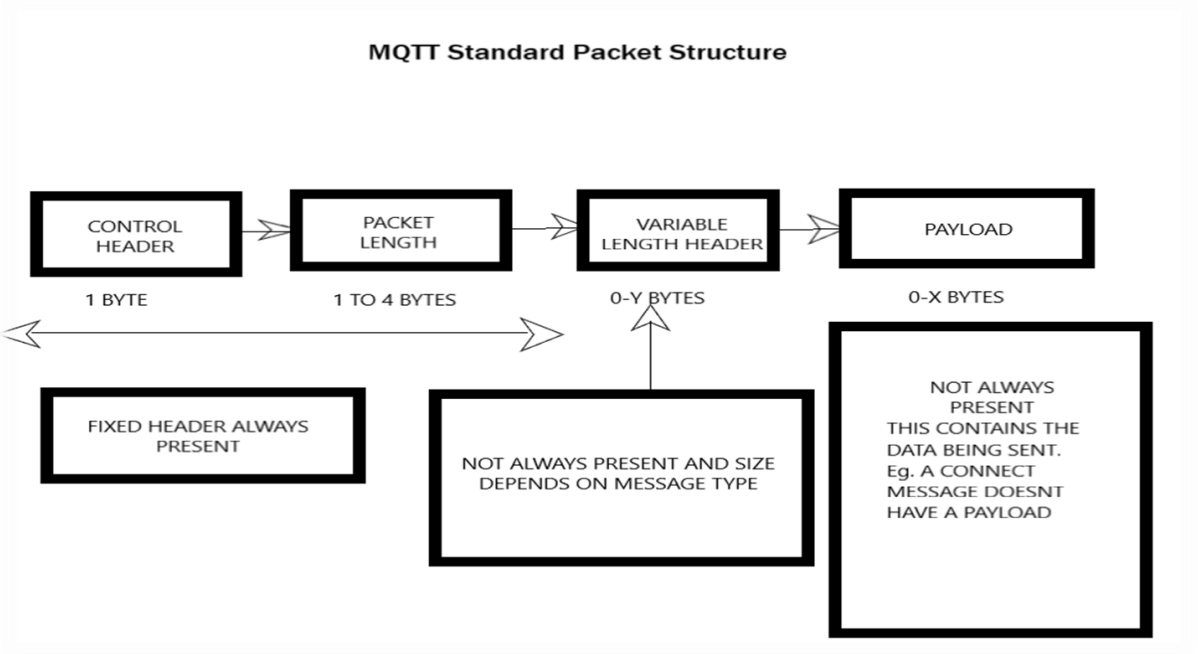
Software Requirements

• *Raspbian OS*

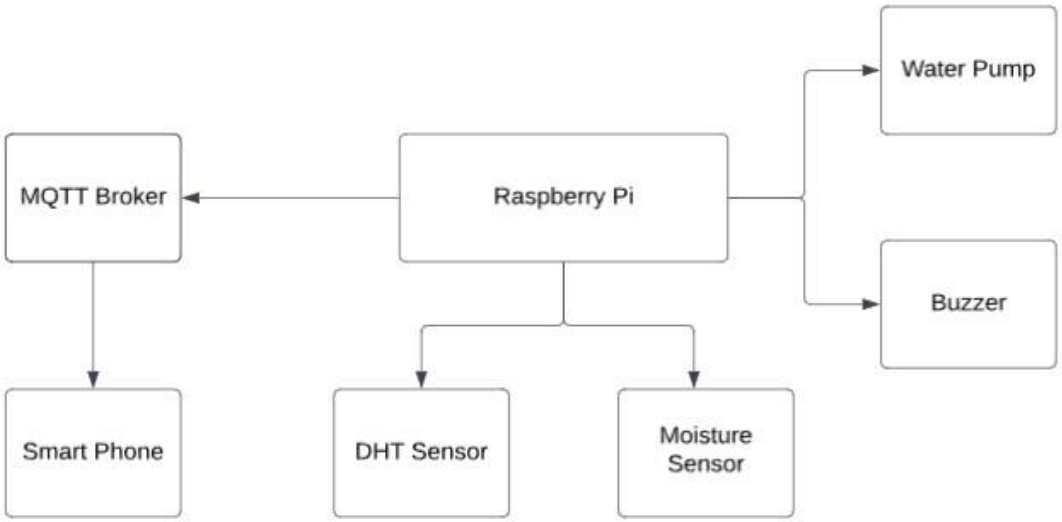
• *Python IDLE*

• *MQTT Protocol*

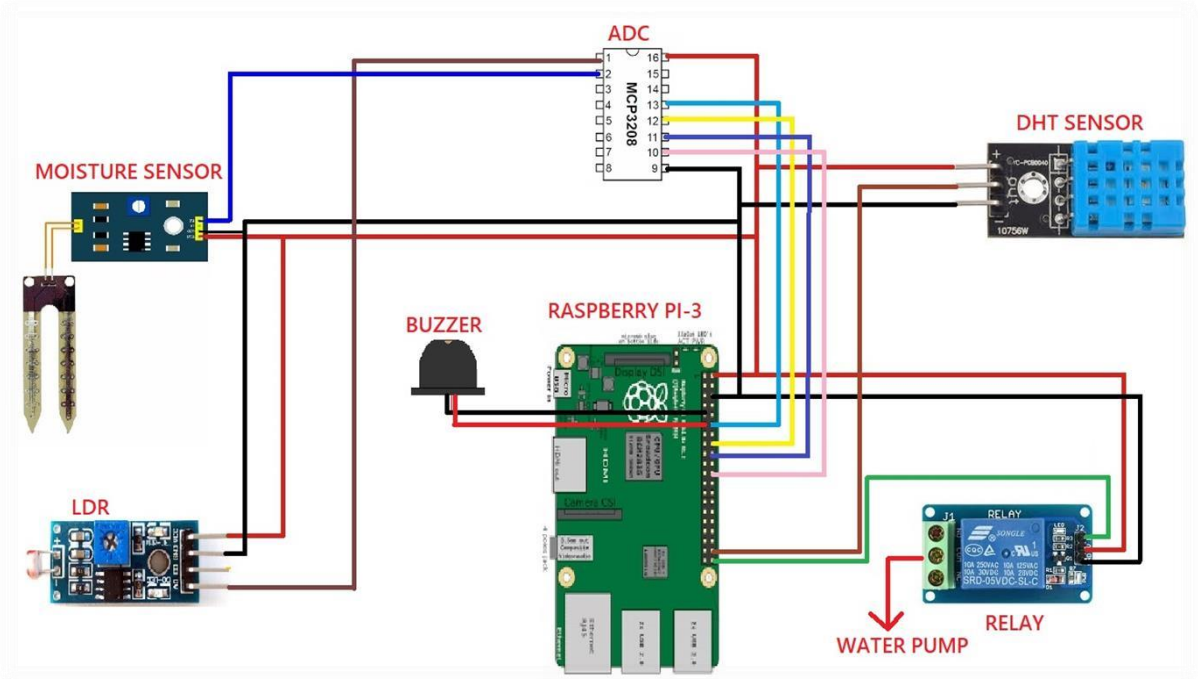
MQTT Packet Structure



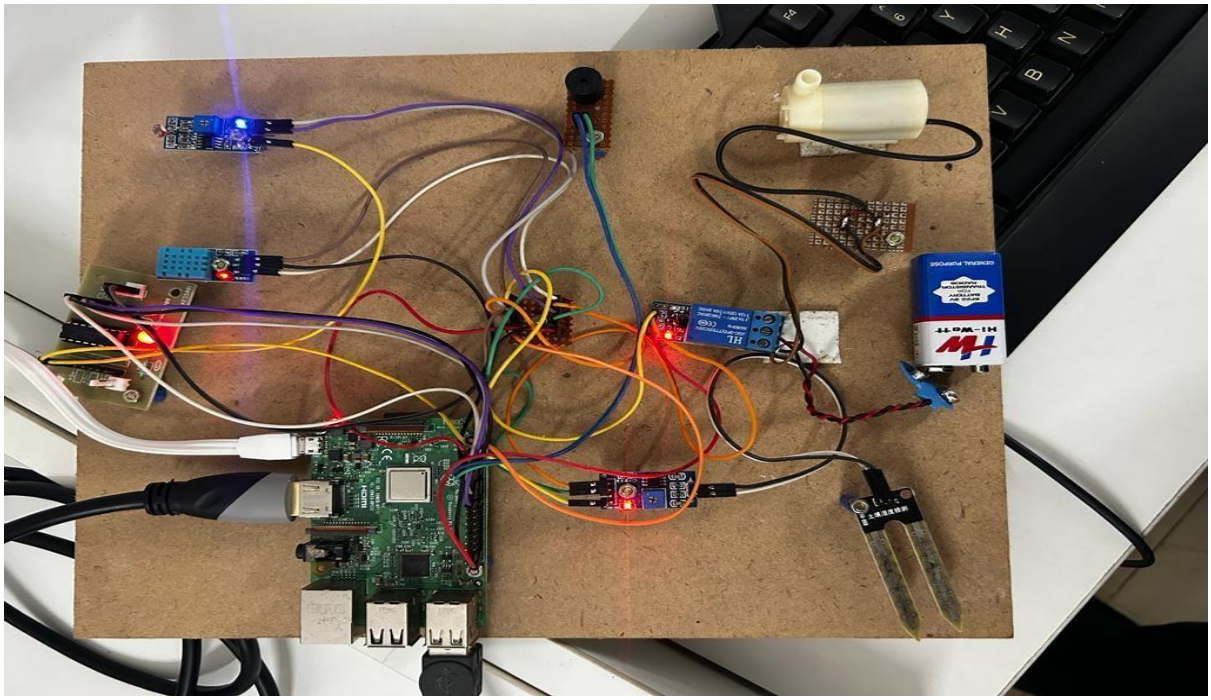
Block Diagram of Purpose System



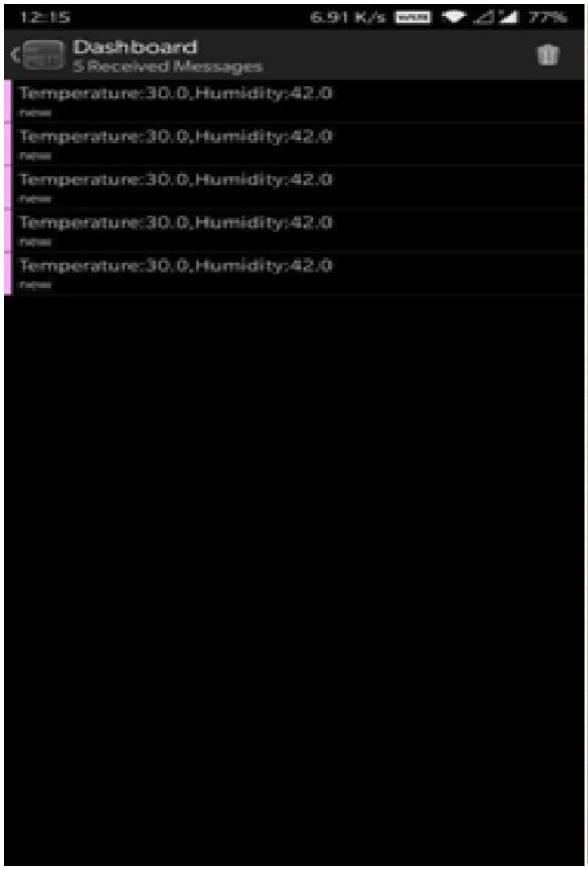
Circuit diagram



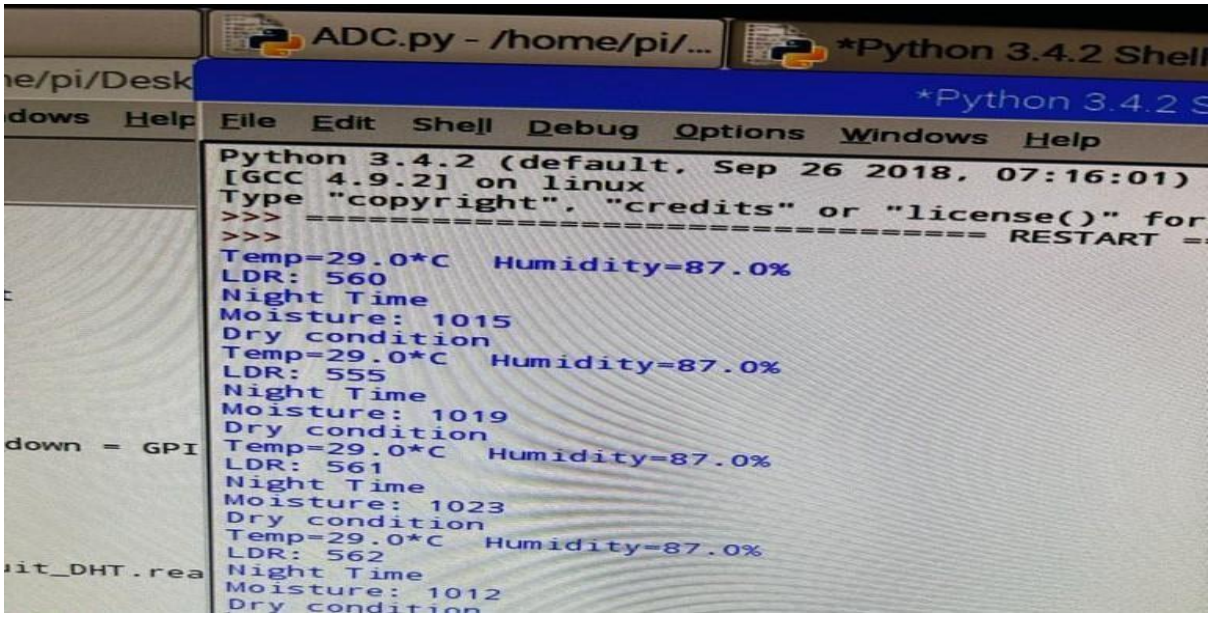
Implementation:

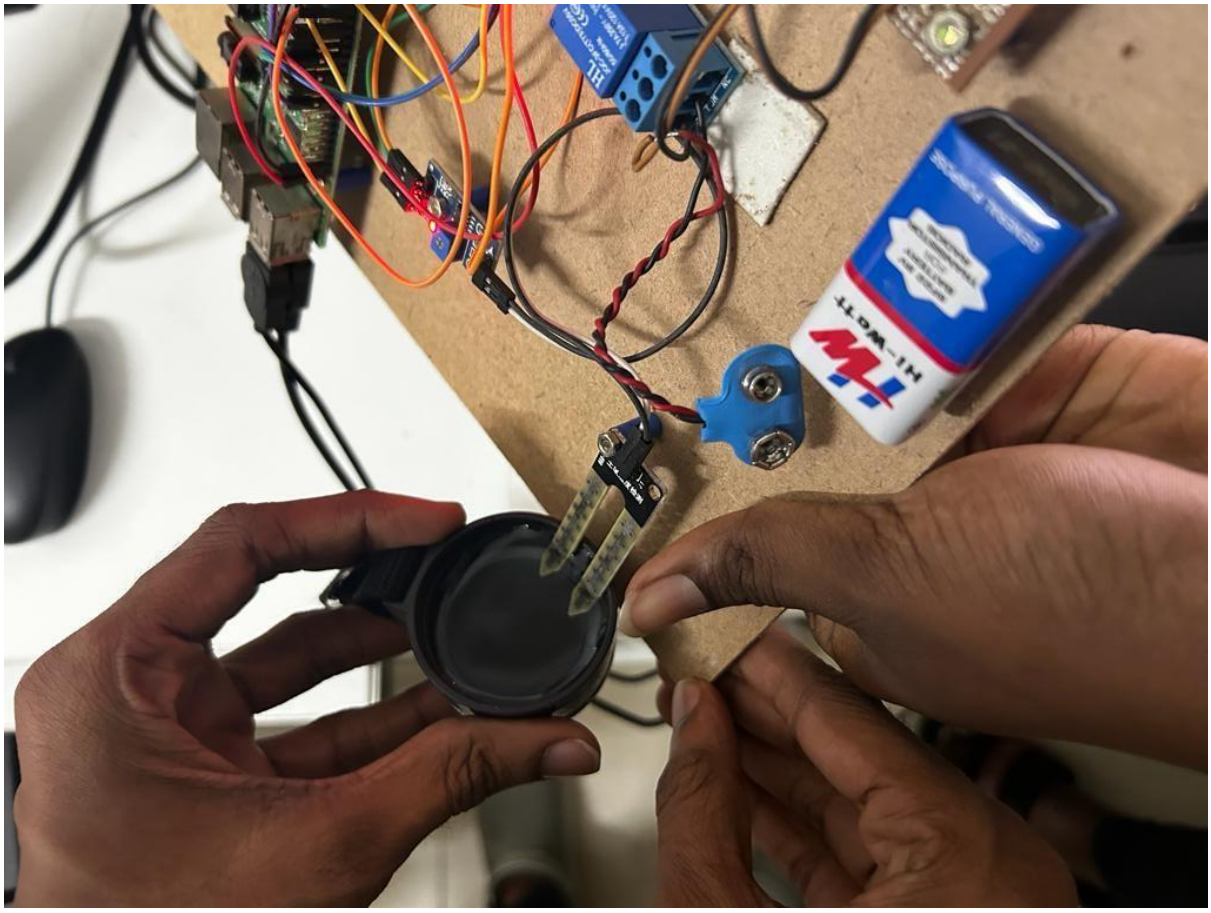


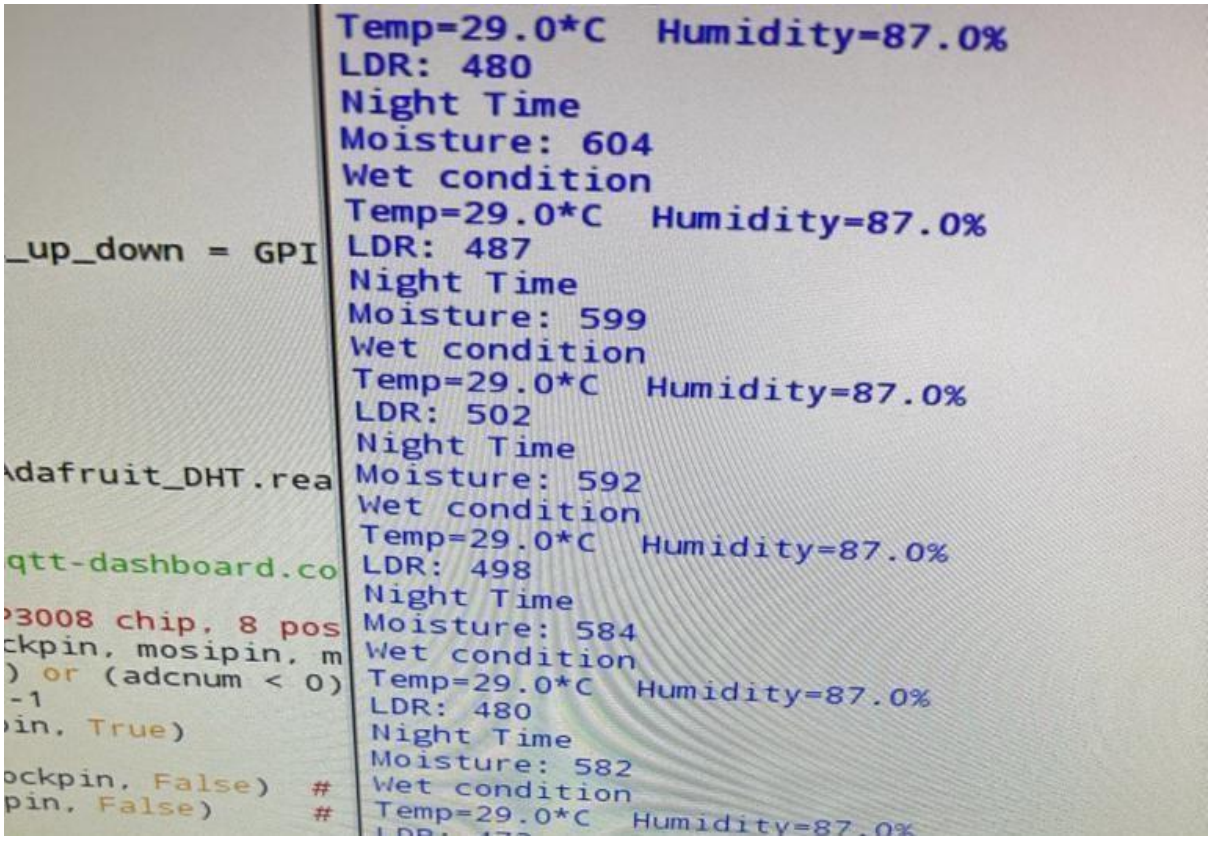
Temperature and Humidity output in mobile connected with MQTT



Output in Terminal







Analysis:-

• *The temperature and humidity level are updated to the user via the app which uses MQTT.*

• *The water pump starts working if the humidity level falls below the required threshold level automatically and vice versa.*

• *Various threshold level can be fixed based on the type of plant and area of the farming.*

Conclusion and Future Work

• *The automated watering of plants and getting the live reports from the farm will reduce the work of a farmer.*

• *Need not to spend a lot of time in farm.*

The further future improvements that can be done in farming using IoT:

1. Aid Pest Management

2. Improving Water Usage

3. Become Climate-Proof