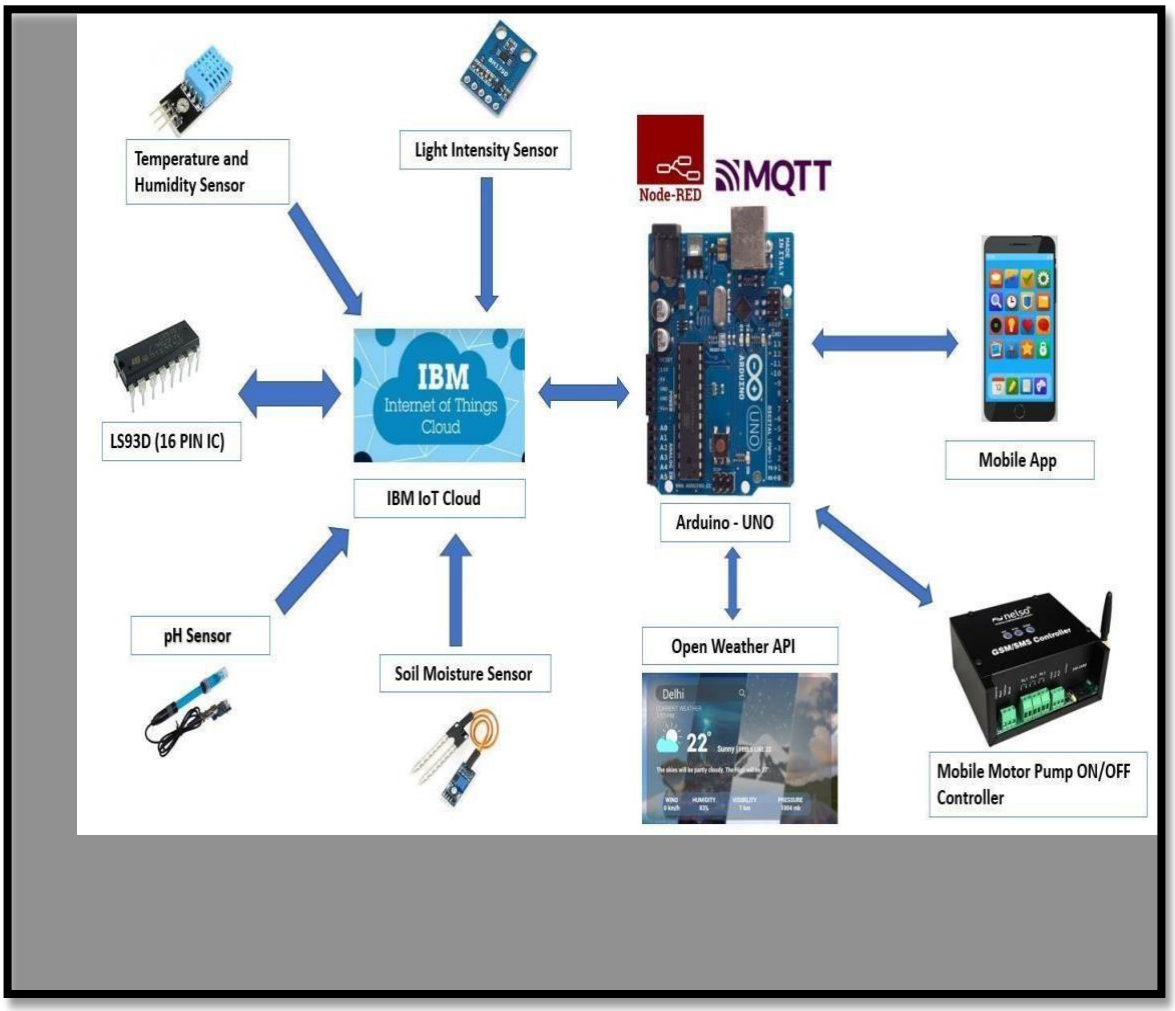
Solution Architecture

Date	21 October 2022
Team ID	PNT2022TMID07140
Project Name	IOT based smart crop protection system for agriculture
Maximum Marks	4 Marks



Key points:

- The different soil parameters (temperature, humidity, light intensity, pH level) are sensed using different sensors and the obtained value is stored in IBM cloud.

- Arduino uno is used as a processing unit which processes the data obtained from sensors and weather data from weather API.

- Node red is used as a programming tool to wire the hardware, software and APIs. The MQTT protocol is followed for communication.

Data Aggregation and Integration: Today, some equipment manufacturers are embedding connectivity into their products, such as fleet telematics solutions that allow farmers to track their machines and analyze sensor data in real-time to optimize crop yield and ultimately boost productivity. Other agriculture solutions like smart water metering, automated pest control systems, GPS, and weather alert systems are becoming more ubiquitous. Since none of these equipment or sensors runs on a standard protocol, one significant challenge is aggregating the data and normalizing it using a real-time data integration platform.

Designing for analytics: Analytics-driven actions provide the real business value for the IoT solution, which is why starting any initiative with a clear understanding of how what it is you're measuring impact your business is crucial. Once a data model has been established, and the relevant data are available for analysis, the natural next question is what useful things can be done with the data? At this point, it is important to identify specific issues or concerns that could be usefully addressed based on information and knowledge derived from the IoT data.

Security: Many devices work on their own secure network, and solution providers/device manufacturers need to consider what security measures must be implemented for detecting and blocking malicious activity over non-standard network protocols. A natural starting point is to consider extending the existing firewall technologies to comprehend these new devices.

Manageability: Many sensors won't have the intelligence to be managed, so, in many cases, manageability can be solved using a gateway. Gateways can be used as a first aggregation point, as well as to condition the data, encrypt it, and determine what has to be sent over the network. Of course, the overall process of managing devices, user access, and security can be achieved by extending existing datacenter systems management capabilities to these new sensors and gateways.

Agriculture IoT reference architecture