PROJECT KICKOFF:-

An overview of Internet of Things and Data analytics in Smart Agriculture

Introduction:

It's becoming increasingly difficult to find parts of the economy that haven't been affected by the burgeoning Internet of Things (IoT) as instrumentation and networking technology combine to offer unprecedented new levels of visibility into the operation of everything from jet engines to breweries .Even a business sector as traditional as agriculture is starting to change in response to the availability of connected sensors and machinery.

Smart Agriculture focuses on acquiring data and combining it from various data sources(sensors) to show the bigger picture under one single Platform(UI), to manage all the activities of the farm. Smart Agriculture is a big leap from traditional farming as it brings certainty and predictability to table. Smart Agriculture employs hardware (IoT) and software to capture the data and give actionable insights to manage all the operations on the farm, both pre and post harvest.Sensors,automation and cloud software systems are tools for smart farming.

Sensor equipment placed throughout the farms collect data and this data is sent to cloud to produce farm insights. Cloud based software collects the data on farm and process the data relative to weather patterns, yields, irrigation.

Background:

As of now we depend on TV', Radios, Internet for upcoming weather prediction . This application is designed to view the weather condition based on the location and also control motor in farms from anywhere just with the help of Internet.As these days the weather prediction has become very difficult we are having a drastic changes in climate these days , due to this we cannot risc to loose the crops, so in order to prevent the loses we can use the sensors to predict the weather and take preventive measures. IoT sensors placed along the farms for gathering data about the temperature,Humidity and the soil mositure send the value to cloud which in return displayed on the user interface. They monitor the crops for changes in light, humidity, temperature, shape and

size. The data collected by sensors in terms of humidity, temperature, moisture precipitation and dew detection helps in determining the weather pattern in farms so that cultivation is done for suitable crops .The analysis of quality of soil helps in determining the amount of water needed for irrigation and to opt most beneficial type of cultivation. IoT in agriculture involves sensors , automatically and semi automatically performing operations and gathering data aimed at increasing efficiency and predictability .

Stakeholders:

The stakeholders are the farmers who are taking the advantage of this application and controlling the application as well as taking preventive measure based on the weather condition .The developer who is designing the application and taking care of the technical part and designing the application with a easy understanding interface.

Objective:

The main Objective of this project is to prevent the crop loses due to any weather changes and to grow a healthy harvest. The deliverables of the project are, time to time updated weather forecast of that location, IOT based Motor control in farms ,assuming there are no insect loses and there is internet availability in that area and the farmer is provided with a smart phone.

Project Risks\Review:

Every project has few difficulties but we need to overcome in order to finish the project.The key problems face in ths project are

Connectivity in rural areas:

In many remote rural locations across the world (particularly in the developing countries, although several locations in the US suffers from this as well), strong, reliable internet connectivity is not available. That, in turn, thwarts the attempts to apply smart

agriculture techniques at such places.

Making sense from big data in agriculture

The modern, connected agricultural farm has, literally, millions of data points. It is, however, next to impossible to monitor and manage every single data point and reading on a daily/weekly basis, over the entire growing seasons (neither is it necessary).

Non-awareness of the varying farm production functions

In-depth economic analysis needs to complement internet tools, to ensure higher yields on farms. Users need to be able to define the correct production function (output as a function of key inputs, like nutrients, fertilizers, irrigation, etc.). Typically, the production function is not the same for all crops, differs in the various zones of a farm, and also changes over the crop/plant-growth cycle. Unless the farmer is aware of this varying production function, there will always remain the chance of application of inputs in incorrect amounts (spraying too much of nitrogen fertilizer, for example) – resulting in crop damages.

Energy depletion risks

A lot has already been written about the environmental advantages of switching over to smart agriculture (precision farming is 'greener'). However, the need for powerful data centers and gateways/hubs for the operation of the smart sensors and other gadgets can lead to heavy energy consumption – and more resources are required to replenish that energy

Technical failures and resultant damages

The growing dependence of agriculture (or anything else, for that matter!) on technology comes with a potentially serious downside. If there is a mechanical breakdown in the hardware, or a farming IoT unit/sensor malfunctions – serious crop damages can be the result.Food safety can be compromised, if the technological resources in the storage area(s) are not functioning. Even a few minutes of downtime due to a power failure can have serious consequences.

Project Scope

Project name: Smart Agriculture System Based On IoT

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Project Overview:

 This project is designed to help the farmers around to world and reduce little physical work and act as a helping hand to predict the climate and take preventive measures before it damages the crops. The main features of this project are, it displays the detailed and updated weather forecast of that piece of land using IOT sensors which are accurate enough to understand the current environment of the land.It displays 3 main things Temperature, Humidity , Soil Moisture on the farmers User interface. Tempertaure to understand whether the crops need to be watered or not, Humidity to understand is it going to rain or crops need to be watered, soil moisture to understand what amount of water need to be supplied.There is another key feature that is motor control. This is designed so that farmers do not miss the crops get watered. Using this farmers can switch on the motor from anywhere, using soil moisture data they can predict how much time motor should be on and then shut it off.In this way we can prevent crops getting damaged and produce a better yield.

Project Scope:

This is an Internet of things(IOT) based project. It works on Node-red flow, Ibm cloud, https req from openweathermaps.org and a python code for motor control.Here we have used IBM IOT bluemix sensor for the sesnor data values which csn be replaced with realtime sesors for accurate value.Https req provides us with the real time weather update to the flow which is displayed on deploying the flow.Upon using subscribepython the motor ON OFF is operated.these are the key operations happening the project.

Project Milestones:

1. Project Planning
2. Installing the work environment
3. Necessary Accounts creation
4. Connecting to IBM cloud and device creation
5. Connecting device to online sensor
6. Connecting and configuring nodes nodes and flow
7. Connecting flow to Openweathermaps.org and IBM IOT device
8. Configuring motor ON,OFF
9. Designing User inteface
10. Deploying the flow and verifying

Project Deliverables:

1. Humidity data displayed
2. Temperature data displayed
3. Soil Moisture data displayed
4. Motor ON, OFF control