Date: 10-May-2019

To

The Dean,

School of Computer and Information Sciences,

University of Hyderabad.

Respected Sir,

Sub: Request for sanction of an amount for the procurement of additional equipment- AgroTech project

Through Single point of contact for Smart India Hackathon (Dr. K. Swarupa Rani)

I Mr. Sameer Gupta, on behalf of Mr. Shravan Kumar - team leader of AgroTech Squad Project, would like to thank you for sanctioning an amount of 8873.6/- towards the procurement of equipment for the implementation of the project. During the implementation, we felt the need of additional equipment for enhancing the functionality of the system. The additional equipment would cost Rs 6000/-. Therefore, I request you kindly sanction us an additional amount of Rs. 6000/- towards the procurement of the equipment. Following is the list of the additional equipment required along with the approximate cost. Also, providing the use case of the equipment for your kind consideration.

S.no	**Equipment Name**	**Approx. Cost(in Rs.)**
1.	PCB Board	180
2.	Raspberry Pi case	178
3.	Raspberry Pi	3162
4.	Power Adapter	270
5.	32 GB sd card	420
6.	Casing	1000
7.	SIM	200
8.	Glue gun	190
9.	Node MCU	400

Total Cost: Rs 6000/-

Thanking You,

Sincerely,

Mr. Sameer Gupta
17MCMC02

(Team Member)

AgroTech Squad

PROJECT- PRECISION FARMING (AgroTech Squad)

INPUT: Real-time values from NPK sensor, moisture sensor, water-level sensor, and current weather prediction of precipitation.

OUTPUT: NPK values, water level and soil moisture that is required in the soil at specific times of growth periods for increasing the yield.

USE CASE OF THE EQUIPMENTS TO BE PROCURED:

1. **PCB Board**: In order to integrate the sensor onto a single chip.
2. **Raspberry Pi case**: In order to protect the coordinator node when installed in the open environment.
3. **Raspberry Pi(EDGE NODE)**: In order to replicates the data received from the multiple coordinator nodes and applying different operation on data such as consolidation of data, Machine-learning algorithm and considers the current climate to predict the water & macronutrients requirement to the field. After analyzing all the aspects, it signals the relay module to irrigate the field and through GPRS sends the analyzed information to the cloud server.
4. **Power adapter (for Raspberry Pi)**: In order to work with Raspberry pie, power supply of 6.2 volts is required, this adapter convert the power supply from 220volt to 6.2volts
5. **32 GB SD CARD**: Raspberry Pi does not have memory of its own, so to store the data we need external memory.
6. **Casing:** In order to protect the equipment (modules) from damage when placed in open environment.
7. **SIM**: In order to provide Internet connectivity to Raspberry Pi for pushing the data onto the cloud storage.
8. **Glue gun**: Used to stick two components and to seal the piped connection between two casings.
9. **Node MCU (ESP8266)**: It acts as a sensor node, receives the data from the sensor and transmit the data to the Raspberry Pi through Wi-Fi.

USECASE OF EQUIPMENT PROCURED:

1. **Assorted LEDs**: In order to check and test error between the sensors and microcontroller boards.
2. **Jumper wires**: In order to connect different electronics component for serial communication and power supply.
3. **Node MCU (ESP8266)**: It acts as a sensor node, receives the data from the sensor and transmits the data to the Raspberry Pi through Wi-Fi.
4. **Eveready Rechargeable Battery:** In order to power up the sensor node (Node MCU).
5. **Soil Moisture Sensor**: In order to sense the real-time moisture level.
6. **Water level Sensor:** In order to know the water absorption rate of field.
7. **5mm Mirror Glass:** Used as reflector for color intensity sensor.
8. **BH1750 color Sensor:** In order to measures the intensity of the reflected light from the soil.
9. **7805 LC:** It helps in regulating the passage of voltage for different components.
10. **GSM Module (SIM 900A)**: It provides internet connectivity to the Raspberry Pi in order to communicate with the cloud server.
11. **Raspberry Pi 3 Model B+ (COORDINATOR NODE):** It collects the data from multiple sensor node and transmits the collected data to another Raspberry Pi (Edge Node).
12. **Bread Board:** It is used to complete the circuit.
13. **USB to VGA Converter**: It is used in order to connect the GSM module and Raspberry Pi for serial communication.
14. **LED Strip (WS2812B)**: It emits the light of programmed wavelength that are reflected by the soil and sensed by BH1750 sensor to generate NPK values.
15. **Power Adapter 5v 2.4 Amps:** In order to work with GSM Module, power supply of 5 volts is required, this adapter convert the power supply from 220volt to 5volts.
16. **Mini Pump:** In order to supply water to the fields, whenever the ML algorithm predicts the water level is below the required level.