Green Smart Gardening System: Problem Statement

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Abstract

Our project is Green Smart Gardening System. By definition, it will be a green energy powered Internet-of-Thing(IOT) device that monitors and analyses the environmental conditions, like temperature, humidity and soil moisture. And it will create a better model of the plants growing patterns based on the analysis, which will interact with the existing smart home equipment to provide a better growing environment for all kinds of plants. Commercial wise, client has a vision to promote this Green Smart Gardening System to Oregon wine industry since grapes‘ quality occupied a great percentage in quality of the wine.

Definition and Description

The Gardening system has not been easy for either industry or family. It is hard to create the best growing environment for different kinds of plants and measuring the plants health data. For individuals, it is hard to properly nursing plants. Most people learned how to nurse their plants by reading or researching online, which is usually different from their environment. They will face different kinds of uncommon health status or disease, which caused by their unique environments. For industries like Oregon wine industry, it is essential to have great grape quality for the wine brewing. Grapes requires certain temperature at daytime and nighttime, and humidity for its growing and sweetness.
Our project, Green Smart Gardening System, is a green energy powered Internet-of-Thing(IOT) device that monitors and analyses the environmental conditions, like temperature, humidity and soil moisture. The analysis will help to create a better model of the plants growing patterns by measuring the plants health status.

Proposed solution

Our Green Smart Gardening System will be a prototype of green energy powered IOT device focusing on the environmental condition monitoring and collecting by using multiple sensors with a micro-controller. The system will be an outdoor green energy powered device, which preferably to use solar with solar battery, and it is supposed to be rain-prove system due to the high percentage of rain in Oregon. By collecting data including temperature, humidity and soil moisture, the sensors will send the data into a central computer wirelessly. Data will be transferred from sensors to computer remotely through the micro-controller, which has not been determined yet. We will find out the ideal micro-controller from the client list. After collecting the data into the database, we will analyze the all the environmental factors using algorithm to find out the best growing environmental factors for the plants. Then the system will adjust the growing environment by interacting with the existing smart gardening system.

Performance Metrics

A prototype of the smart gardening system with
(1) Basic environment monitoring capability (e.g. soil moisture, temperature, humility, and air condition, etc.) using green energy
(2) Transfer captured data into a computer for data analysis
(3) It has to be reliable and consistent(Don‘t have to change battery or sensors at least within a year)
(4) Transmit analyzed data into a phone or another device wirelessly (optional)
(5) Build data analytic model for plants health verse environment factors (optional)