# Development of online farm Environmental data collection and automatic irrigation system

INTRODUCTION

The Smart Irrigation System is a system that is capable of performing automatic irrigation process by analysing the moisture of soil and other climate conditions. It uses sensor technology and Internet of Things (IoT) to collect necessary parameters and store those data online for better management, control and analysis. The farm manager can access those data easily via mobile device or computer.
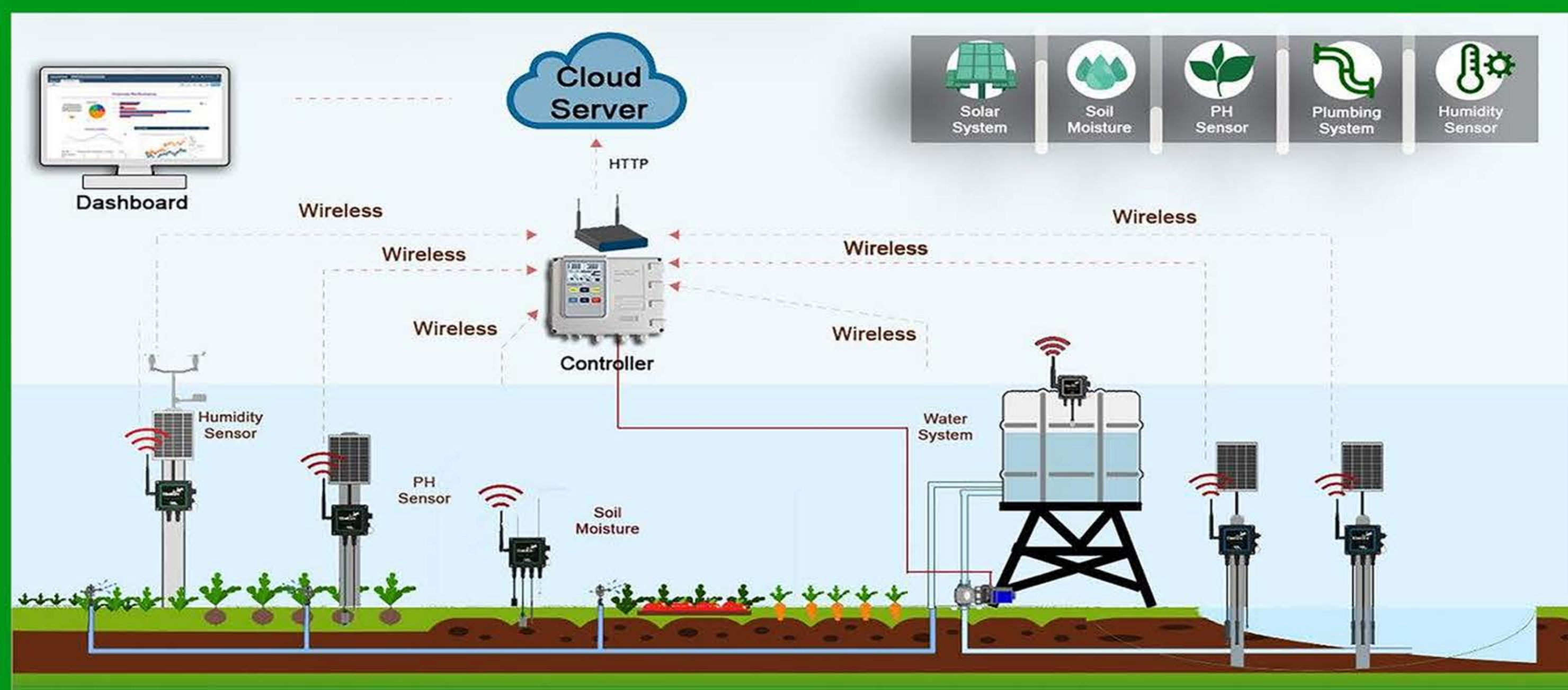

OBJECTIVE

This project has carried out a development the Automatic irrigation system and farm environment data collection system using wireless sensor network in farm. Many sensor nodes are installed in the farm to collect information such as temperature, humidity, soil moisture, solar radiation then send to the controller by using ZigBee communication. Automatic irrigation is depending on soil moisture level or when the soil is dry, the controller will activate the pump and when the soil is wet enought the controller will stop the irrigation. On the data collection, the sensor nodes working in farm will send data to the controller and the controller communicated with NodeMCU for sending those parameters to cloud platform (ThingSpeak) via the internet.

APPLICATION

This approach is for the advancement of irrigation process by automatic method related to the field and thus improves irrigation. This type of system is often used for general plant care as part of the care of vegetable crops in small and large farms.

ARCHITECTURE

The proposed monitoring system consists of two sensor nodes and one controller module. Sensor node is the electronic board connect with several sensors and wireless module. Sensor Node 1 (SN1) uses Arduino Uno to connect to DHT22 sensor for air temperature and humidity, and to 10HS sensor for soil moisture measurement. It also has Zigbee wireless module for communication and data transfer to main controller. Sensor Node 2 (SN2) is the same as SN1 adding a Davis Solar radiation sensor. The controller module consists of Arduino as main microcontroler attached with LCD display to show data, with relay to control the water pump (valve) and with Node MCU to connect to internet via wireless modem. Thinkspeak is used as cloud platform.
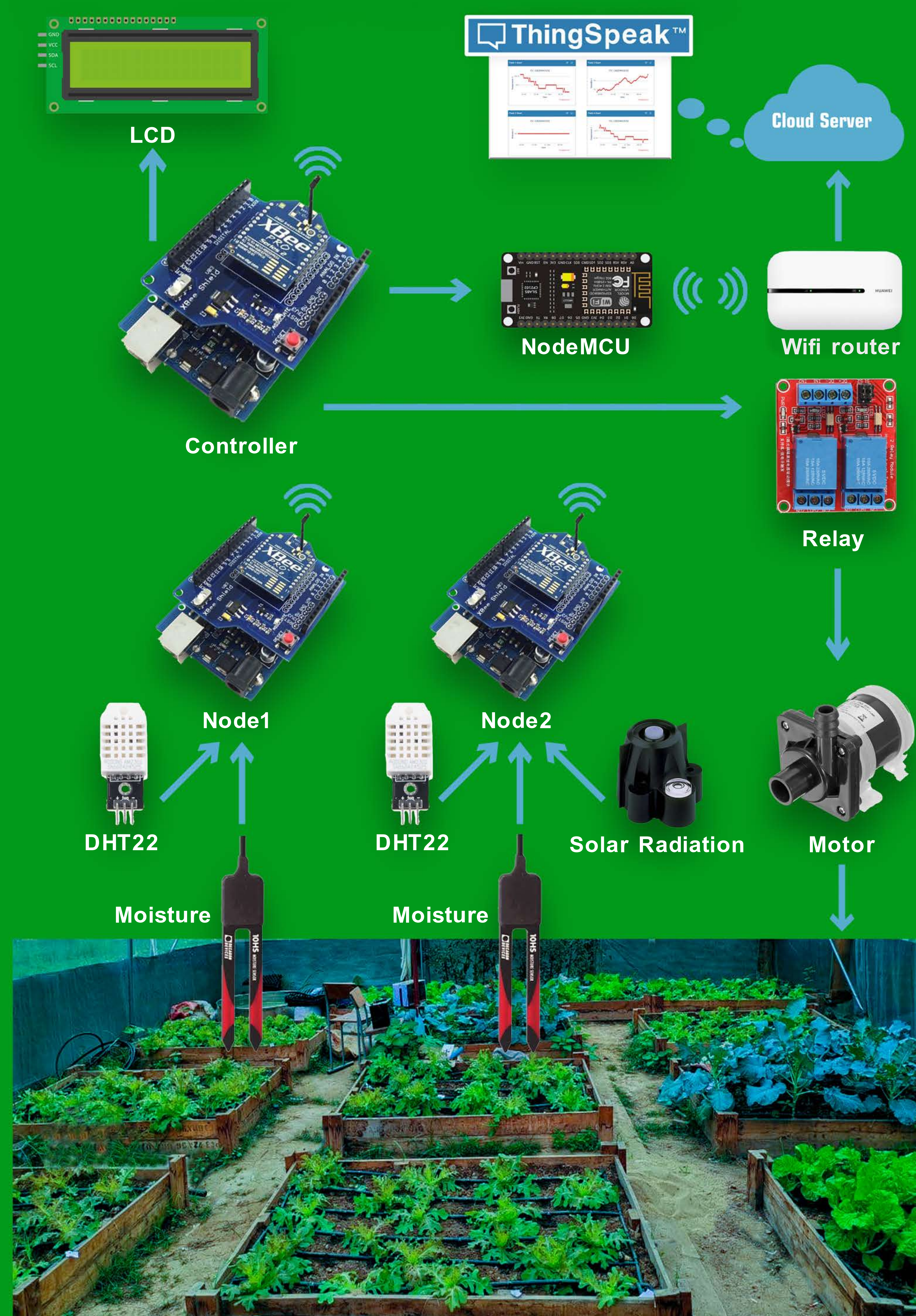
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