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Department of Electronics and Communication Engineering

IBM NALAIYA THIRAN

LITERATURE SURVEY

TITLE : IOT Enabled Smart Farming Application for Irrigating System

DOMAIN NAME : Internet of things **LEADER**

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ABSTRACT

The growth of the global population coupled with a decline in natural resources, farmland, and the increase in unpredictable environmental conditions leads to food security becominga major concern for all nations worldwide. These problems are motivators that are driving the agricultural industry to transition to smart agriculture with the application of the Internetof Things (IoT) and big data solutions to improve operational efficiency and productivity.
The IoT integrates a series of existing state-of-the-art solutions and technologies, such as wireless sensor networks, cognitive radio ad hoc networks, cloud computing, big data, and end-user applications. This study presents a survey of IoT solutions and demonstrates howIoT can be integrated into the smart agriculture sector for irrigating systems.

INTRODUCTION

This project has been designed for surveillance of irrigation systems in farms without the need of manual checking of irrigation systems. For example, if you are staying in Chennai, and have your farm in Karur or elsewhere, it is not possible for you to go to the farms everytime to keep a tab on the plants. Instead, this project allows you to check up on your plants using a simple IoT system. The positive part of this project is that, the node used to connectthe system to your smart device, also controls the flow of water from the pump and also thetiming intervals in between the irrigation cycles. In this paper we will be discussing all
about the project as to how it is constructed and how it works.In order to meet the current global needs of humanity, new solutions and technologies are constantly being proposed and implemented. This has led to the advent of the Internet of Things (IoT) . IoT is definedas the network of all objects that are embedded within devices, sensors, machines, software

and people through the Internet environment to communicate, exchange information and interact in order to provide a comprehensive solution between the real world and the virtual world . In recent years, IoT has been applied in a series of domains, such as smart homes, smart cities , smart energy , autonomous vehicles , smart agriculture, campus management], healthcare, and logistics. An illustration of rich and diverse IoT applications for smart agriculture.In the smart agricultural sector, automation solutions and technologies, mechanical machines, knowledge, decision-making
tools, services, and software are integrated seamlessly to help farmers improve productivity, product quality, and profitability

LITERATURE SURVEY

Joaquin Gutierrez et al., 2013 [1] proposed an irrigation system that uses photovoltaic solar panels to power the system because electric power supply would be expensive. For water saving purposes, an algorithm developed with threshold values of temperature and soil moisture programmed into a micro controller gateway. The system has full duplex communication links based on internet cellular interface using GPRS based on mobile data for graphically display and stored in a database server. The automation irrigation system consists of two components: WSU and WIU. Wireless Sensor Units (WSU) components were used for minimize power consumption because the microcontroller is well suited by its lower power current in sleep mode. Wireless Information Unit (WIU) transmits soil moisture and temperature data to a web server using the GPRS module. The WIU identified, recorded and analyzed received temperature and soil moisture data collected by WSU. WIU functionality is based on microcontroller that programmed to perform different task as to download the date and time information from web server and compare the temperature and soil moisture value with maximum soil moisture and minimum temperature value so that irrigated pumps

M.Nesa Sudha et al., 2011 [2] proposed a TDMA based MAC protocol used for collecting data such as soil moisture and temperature for optimum irrigation to save energy. MAC protocol plays an important role to reduce energy consumption. Two methods used for energy efficiency are Direct Communication method and aggregation method. Direct Communication method provides collision free transmission of data, because all the sensor nodes send data directly to the base station without the need of a header node. This method is better where the base station is near but it is not optimal where the base station is far because sensor nodes consume more energy during transmission of data and if there is much data to the sensor node, sensor nodes are quickly damaged. The data aggregation method is better to use rather than a direct communication method. The sensor node senses the data and sends it to the head node. The head node collects data from the entire sensor node, performs aggregation using various aggregation techniques, and then sends data to the base station. Thus by using aggregation methods overall energy consumption is reduced. The simulation results show that aggregation methods provide better performance rather than direct communication methods. It provides 10% increase in residual energy and 13% increase in throughput. Sensor nodes consume more energy while transmitting works.

T.C. Meyer et al., 2015 [3] represents the design of a smart sprinkler system using mesh capable WSN for monitoring and control of field irrigation systems. This system provides accuracy by controlling the soil moisture level between the thresholds. Sensor nodes send data to the base station every time the timer variable overflows. Base station has an actuator interface to control solenoid valve using GUI. GUI provides system feedback to usallows changing the parameter and initially setup the system. Air temperature, soil temperature and humidity greatly influence the tomato crop. Certain diseases occur in tomato crop due to high humidity and warm temperature such as gray mold and leaf mold.

Jaume Cosadesur et al., 2012 [4] proposed an algorithm using a feedback mechanism that gives a response about the effect of applying the schedule it generates for the crop water needs. The goal of this algorithm is to schedule irrigation according to requirements of each grove and to the variability during the season caused by weather conditions and other factors. The algorithm performs seven different tasks as firstly it measures the amount of water given each day to the farm depending on weather conditions and crop growth. It implements the installation of the water management system to manage the amount of water delivered to the crops in the farm, execute the irrigation schedule, and measure the effects of the schedule on the crop and the data collected by the sensors processed to extract meaningful information for decision making. The algorithm that detects an event will trigger the execution of specific procedures for that type of event and at last implement the feedback mechanism to close the loop of the algorithm. The result shows that the simple water balance gives fast response rather than feedback mechanism for weather conditions.

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