The Smart Farming System

Computer Organization and Architecture

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Dr. Manish Kumar Bajpai

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Team members:

Uditi Das - 21BCS225

Jyotsna Telgote - 21BCS221

Shreya Singh - 21BCS195

Introduction

Agriculture is one of the important business that mainly affects the mankind. From the Ancient to the agricultural revolution farming is the way human used to harvest plants and consumed them in their daily life. Farming has been improved by many technologies that have impacts on agriculture such as harvest machine, seed drill machine, reaper machine, and the others that can reduce manpower and waste time. Recently there are few research works on smart farming. The proposed system can be used to monitor fields such as water and soil. TO increase the crop yield, the smart farming technology would help. In this work, a smart farming system is proposed. Smart farming is the technology that uses the concepts of Iot to help farmers to monitor and sense useful information from their farms in order to help in the quality improvement and product quantity.

Proposed System

Our proposed Smart Farming System consists of two main parts. The first one is a Sensor system, which includes temperature and humidity sensor, a soil moisture sensor, Ph sensor. The second part covers control system includes a water pump for watering system and roofing system. The system provides the sensed data from all the sensors so as to help the farmer to make a proper decision about controlling the system . The system Provides the sensed data from all the sensors so as to help the farmer to make a proper decision about controlling the system. Watering system and a sensing system are controlled using a dc motor. Roofing system is controlled by a servo motor. Programming is done with C and arduino language. In order to maintain the proper temperature exhaust fans and water spray is used. Water level sensor indicates the amount of water in the reservoir which is

used as a source for the watering system, The watering system in turned on and off in order to maintain the proper moisture content of the soil.

1. Arduino mega
2. Temperature Sensor.

Hardware Design for a proposed system.
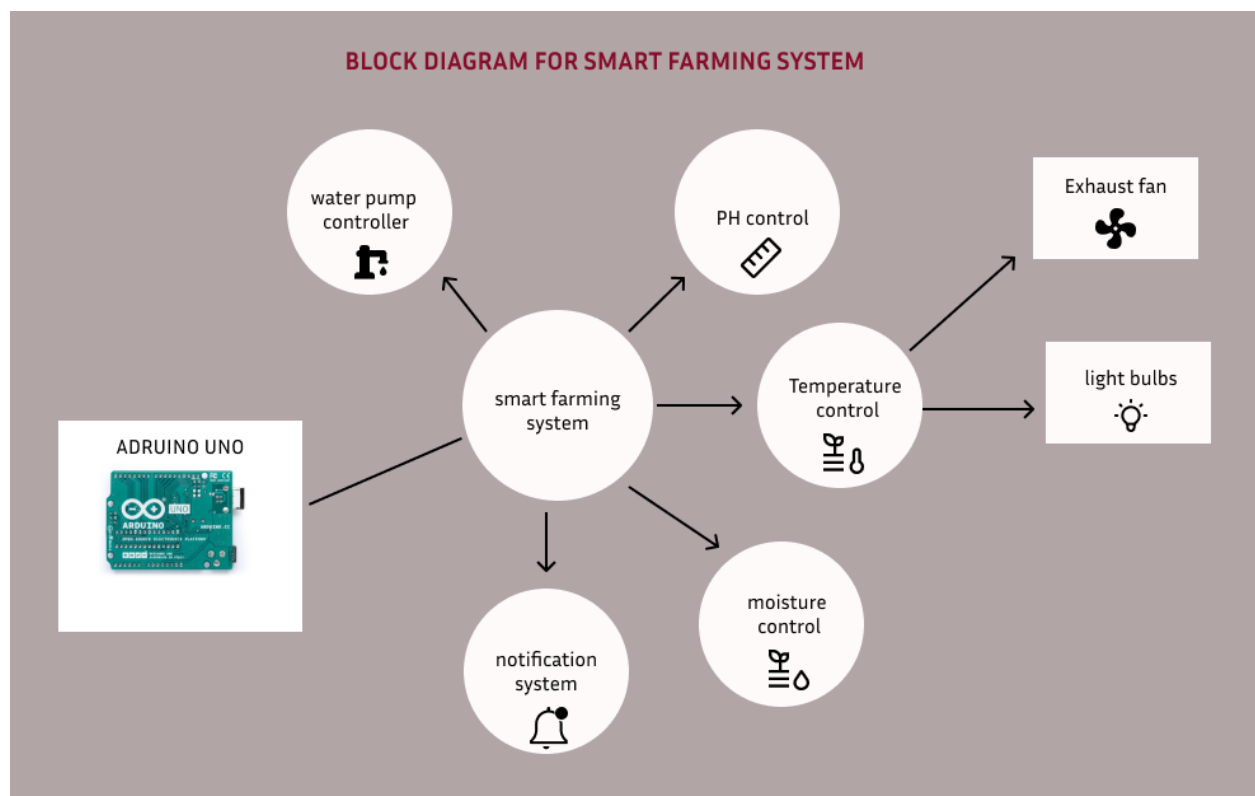
Components requirement

I. Sensors

➤ **DHT11 Sensor :** DHT11 (DIgital Humidity and Temperature sensor) will measure the temperature and humidity of the climate.

➤**Soil Moisture Sensor:** Soil Moisture sensor is meant to measure the volumetric content of water inside the soil and serves us with the

moisture level at the output. The sensor can be used in both analog and digital mode since it is equipped with both analog and digital output.

➤ **ph Sensor:** This will measure the Ph level of soil.

II. Water Pump

When the moisture level of the soil falls below a certain level, The Water pump will trigger the water supply to automatically turn on, and after reaching a certain level it will turn off when moisture supply is proper. Moisture level of the soil will be measured by a moisture sensor.

III. Water Spray

When the relative humidity measured with the help of a humidity sensor will fall below 50, then the water spray will turn on, it will also turn on when the temperature rises above 20 degree celsius.

IV. GSM Technology

Integration of the GSM module to the Arduino will help us achieve real time updates on the condition of the plot of the land such as when the Ph and moisture content of the soil is not optimum users will be warned through notifications.

V. LCD Display

This will be used to show all the readings that will be taken from the sensors to show the overall condition of the crop. Weekly reports of crop condition and health will be shown.

VI. Exhaust Fan

An exhaust fan will be used to increase the airflow of the Greenhouse. This contributes to controlling both the temperature and humidity of the air.

VII. Light Bulbs

We will use bulbs to control the temperature when the temperature falls below 15 degree celsius.

VIII. Arduino Mega

Arduino is an open-source platform (prototype platform) which is based on an easy to use hardware as well as software. It comprises a circuit board, which shall be programmed(usually known as a microcontroller) and a software called IDE(Integrated Development Environment), with which one can write and upload the computer code on to the physical board.

Circuit Design:
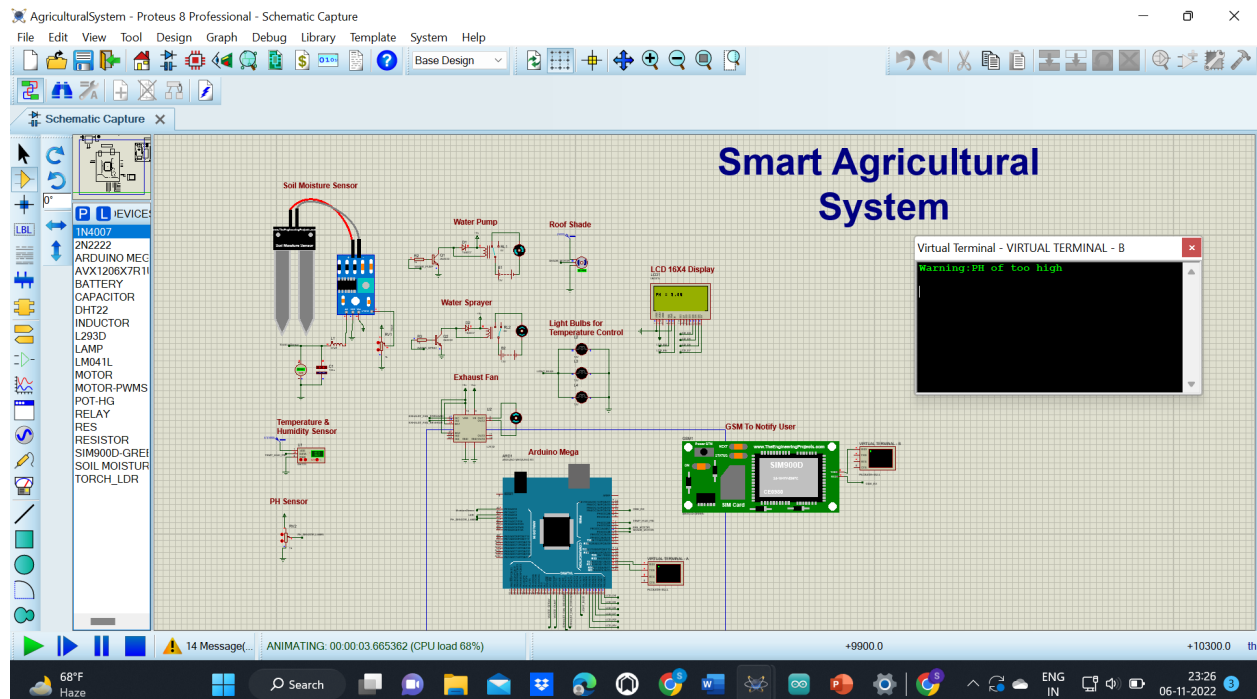
CONCLUSION:

The project has a vast application in the field of agricultural research and development. We can conclude that the sensors used in the sending part of the project are ample for the reading of parameters required for the growth of plants kept in observation. Automated water pump driven by input from moisture sensor is implemented. We can infer the fast growth rate by implementing this system for different plants and can acquire data to maintain fast plant growth rate.