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IOT BASED AGRICULTURE AUTOMATION

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ABSTRACT

Smart farming, IOT based agriculture Automation and Agriculture 4.0 all involve the integration of advanced technologies into existing farming architecture. The goal is to increase production efficiency and product quality, as well as reducing overall costs. To this end, the inclusion of Smart technologies into Irish agriculture has been inevitable with increased pressure being placed on farming practices to remain profitable, as well as adhere to environmental regulation.

The global Smart Agriculture Solution Market is said to have stood at around US $10.2 Billion in 2016, and is projected to reach a valuation of US $38.1 Billion by the end of 2024. The growing adoption of advanced technology in farming, from agricultural drones, precision seeding systems, auto-steering, automatic feeding systems and fruit-picking robots (amongst others), have all incentivised traditional agri-companies to invest in smart agriculture technology. The deployment of advanced agri-tech has the potential to allow for an increased focus on non-profitable tasks, such as farm maintenance and environmental practices. The reduction of heavy labour and tedious tasks can also lead to improvements in the health and work/life balance of farming staff.

1.INTRODUCTION

Agriculture is done in every country from ages. Agriculture is the science andart of cultivating plants. Agriculture was the key development in the rise of sedentary human civilization. Agriculture is done manually from ages. As the world is trending into new technologies and implementations it is a necessarygoal to trend up with agriculture also. IOT plays a very important role in smartagriculture. IOT sensors are capable of providing information about agriculture fields. we have proposed an IOT and smart agriculture system using automation. This IOT based Agriculture monitoring system makes use of wireless sensor networks that collects data from different sensors deployedat various nodes and sends it through the wireless protocol. This smartagriculture using IOT system is powered by Arduino, it consists of Temperature sensor, Moisture sensor, water level sensor, DC motor.

2. Methodology of Project

This project is planned to do with IOT. we are using adfruit io platform for IOT .

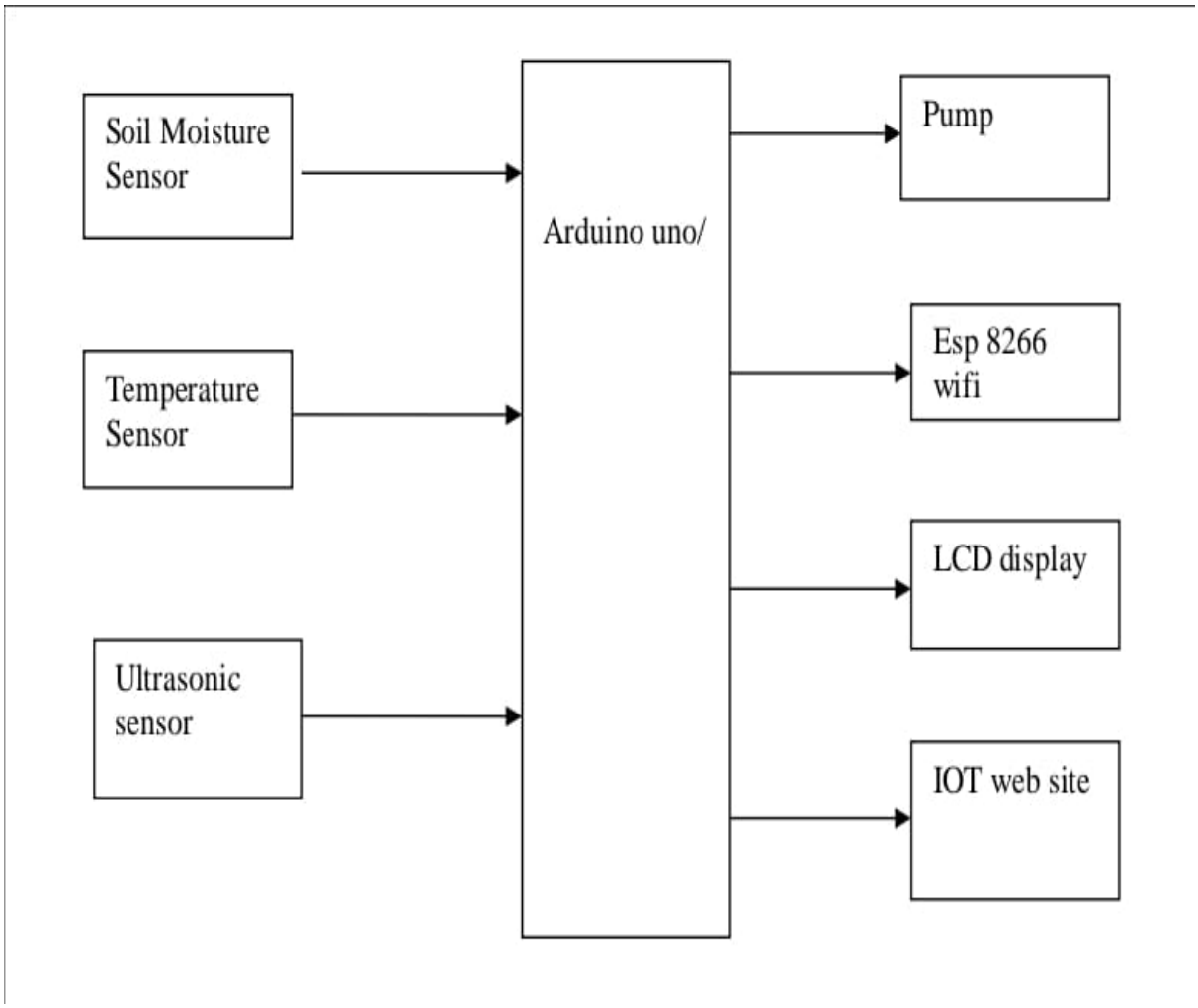
We have to do registration on adafruit io platform to use its facility. This platform is accessible with password & ID. Node MCU microcontroller is master controller which control the whole process. Soil Moisture sensor is used to measure moisture of soil and gives signal to the NodeMcu. Soil moisture sensor is placed in soil. Temperature sensor is used to monitor the atmospheric temperature.it is connected to the Nodemcu as a input. Water level sensor is used to monitor the water level to protect the pump. Soil moisture sensor, Temperature sensor, Water level sensor are the input to nodemcu. We

have to do programming in nodemcu using Arduion IDE software. Data is processed and uploaded on Adafruit io platform and control action is performed.

3.Objective of the Project:

To provide Automation in the field of Agriculture by using Internet of Things that makes easy monitoring & control of the Soil moisture, Temperature & Water level, Arduino UNO, ESP wifi module

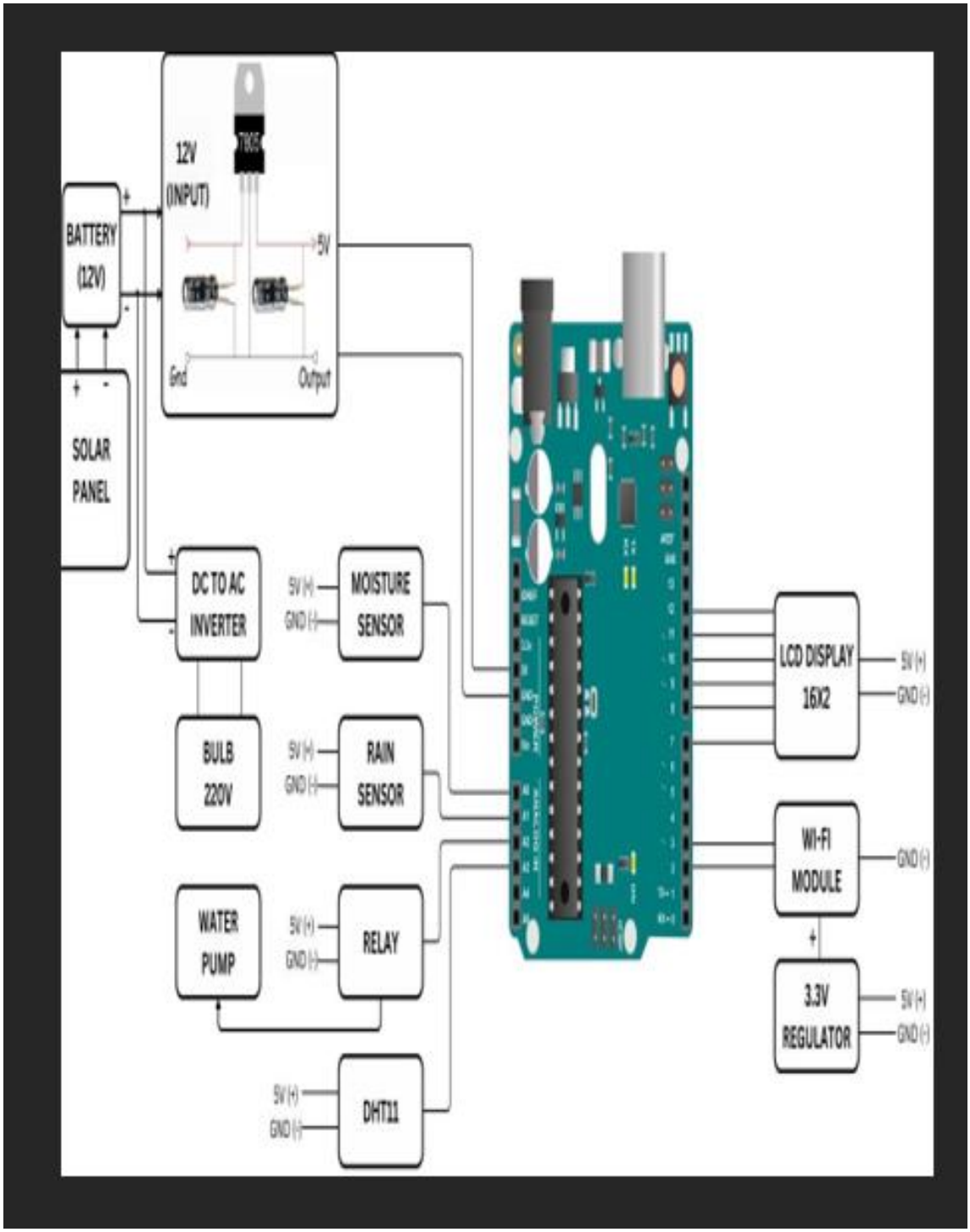
4. Block Diagram:



5.Working:-

When the IOT based agriculture monitoring system starts it checks the water level, humidity and moisture level. . Sensors sense the level of water if it goes down, it automatically starts the water pump. If the temperature goes above the level, fan starts. This all is displayed on the LCD display module. This all is also seen in IOT where it shows information of Humidity, Moisture and water level with date and time, based on per minute. Temperature can be set on a particular level, it is based on the type crops cultivated. If we want to close the water forcefully on IOT there is button given from where water pump can be forcefully stopped.

6.CIRCUIT DIAGRAM



7.Heart of Project :

7.1. Arduino UNO

The Arduino Uno is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.x) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.

7.2. Specifications:

Microcontroller	Atmel ATmega168 or ATmega328
Operating Voltage (logic level)	5 V
Input Voltage (recommended)	7-12 V
Input Voltage (limits)	6-20 V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	8
DC Current per I/O Pin	40 mA
Flash Memory	16 KB (ATmega168) or 32 KB (ATmega328) of which 2 KB used by bootloader
SRAM	1 KB (ATmega168) or 2 KB (ATmega328)
EEPROM	512 bytes (ATmega168) or 1 KB (ATmega328)
Clock Speed	16 MHz
Dimensions	0.73" x 1.70"
Length	45 mm
Width	18 mm

8.Future Scope:-

This project has large scope in agriculture field. Continues monitoring is possible so that effective control action is performed.
Monitoring and controlling from remote location is possible.
Weather forecast of Metrological department can become supportive system and can be effective.
As large data is generating that leads to effective implementation AI.

9. Conclusion:

This project can be implemented effectively by using Nodemcu and IOT platform of adafruit Io. Sensor data can be displayed on IOT platform.
Effective control and live monitoring is possible due to IOT.

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