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SMART FARM FERTILIZER AND PESTICIDE PREDICTION USING IOT

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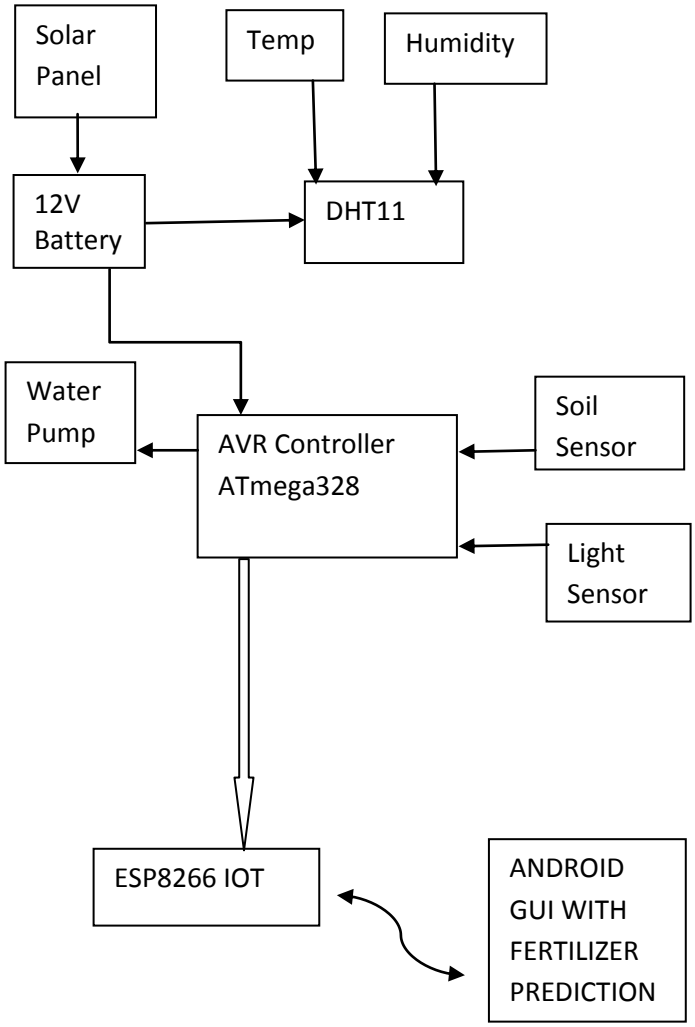
ABSTRACT – This project gives the use of technology in the field of agriculture. IOT is a shared Network of objects where these objects interact through Internet. One of the important applications of IOT is Smart Agriculture. Smart Agriculture reduces wastage of water, fertilizers pesticides and increases the crop yield. Here a system is proposed to monitor crop-field using sensors for soil moisture, humidity and temperature, Light Sensor. By monitoring these parameters the irrigation system can be automated if soil moisture is low.

***Key Words*: IOT, AVR ATmega328, Sensor Network, Smart Agriculture**

INTRODUCTION

As the world is trending towards new technologies and implementations it is a necessary goal to trend up in agriculture too. Many researches are done in the field of agriculture and most of them signify the use of wireless sensor network that collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity. Hence, automation must be implemented in agriculture to overcome these problems. In order to provide solution to such problems, it is necessary to develop an integrated system which will improve productivity in every stage. But, complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level, it is not given to the farmers as a product to get benefitted from the resources. Hence, this paper deals about developing smart agriculture using IoT and given to the farmers.

BLOCK DIAGRAM



Fig, Block diagram of Smart Farm Fertilizer Prediction

BLOCK DIAGRAM DESCRIPTION.

AVR Microcontroller

AVR is a family of microcontrollers developed since 1996 by Atmel, acquired by Microchip Technology in 2016. These are modified Harvard architecture 8-bit RISC single-chip microcontrollers. AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as

opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time. There are number of popular families of microcontrollers which are used in different applications as per their capability and feasibility to perform the desired task, most common of these are 8051, AVR and PIC microcontrollers.

Solar Panel

In our project solar panel is used as resource for generating electricity. solar panels absorb sunlight as a source of energy to generate direct current electricity, either directly using photovoltaics, indirectly using concentrated solar power, or a combination. Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Photovoltaic cells convert light into an electric current using the photovoltaic effect.

12V Battery

This is the circuit of a simple 12 volt battery charger for Lead Acid battery. It gives 12 volt and 1.5 Amps current for quick charging of the battery. Charging remains ON till the Battery level reaches 12V and then the charging circuit is turned OFF automatically.

Soil Moisture Sensor(YL-69)

Soil moisture sensor measures the water content in soil. It is used to sense the moisture in field and transfer it to AVR controller in order to take controlling action of switching water pump ON/OFF.

DHT11 Temp/Humidity Sensor

The DHT11 is a basic, low-cost digital temperature and humidity sensor. It gives out digital value and hence we can give its output directly to data pin instead of ADC. It has a capacitive sensor for measuring humidity. The only real shortcoming of this sensor is that one can only get new data from it only after every 2 seconds.

Light Sensor

The working principle of an LDR:

As a light sensor we use the LDR. As per changes in the atmosphere such as cloudy environment, wheather changes it gives output to the Controller. According to it input necessary fertilizer is being choose.

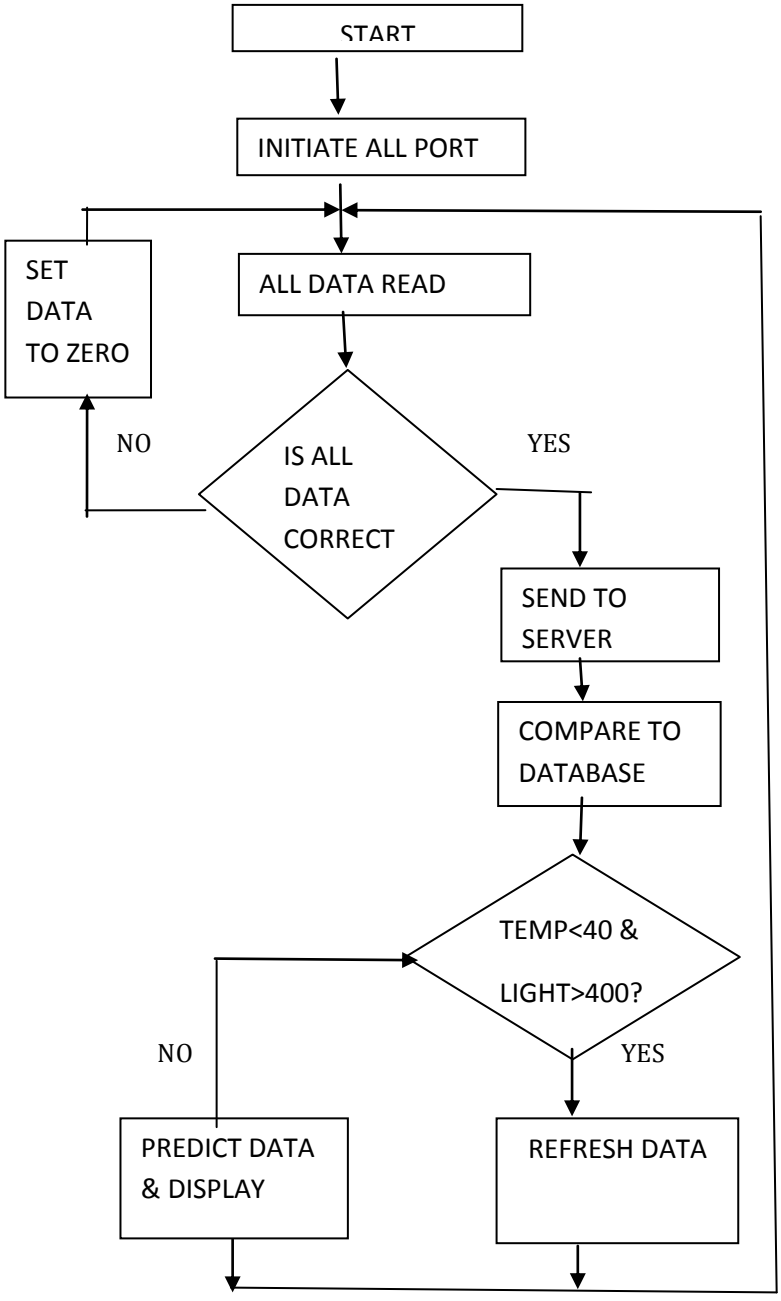
WIFI MODULE

ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi. This small module allows microcontrollers to connect to a Wi-Fi network.

7805 REGULATOR

The LM7805, like most other regulators, is a three-pin IC. **Pin 1** (Input Pin): The Input pin is the pin that accepts the incoming DC voltage, which the voltage regulator will eventually regulate down to 5 volts. **Pin 2** (Ground): Ground pin establishes the ground for the regulator. **Pin 3** (Output Pin): The Output pin is the regulated 5 volts DC

Flow Chart



WORKING

Power supply is start. Give the internet connection to the WiFi Module. Open the BLYNK app in the android device & chech the status of sensor. Then application displays our result as per following conditions.

1. If Temperature <40 & Light<400 then

   Disease = Burashi

   Fertilizer = Index/sisten/Luna

2. If Temperature >40 & Light<400

   Disease = Davanya

   Fertilizer = Karjat/Flex Super

3. If Temperature >40 & Light>400

   Disease=Mill-Bag

   Fertilizer = Crepto-3+Neon

CONCLUSION

All observations and experimental tests prove that this project will be a complete solution to the field activities irrigation problems. Implementation of such a system in the field can definitely help to improve the yield of the crops and aids to manage the water resources effectively reducing the wastage

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