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Smart E-Farming

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Abstract: Agriculture plays vital role within the development of agricultural country. In India about 70% of population depends upon farming and one third of the nation's capital comes from farming. Issues concerning agriculture are always hindering the event of the country. The only solution the present to the present problem is sensible agriculture by modernizing the current traditional methods of agriculture. Hence the project aims at making agriculture smart using automation and IoT technologies. The concept smart-e-farming is developed for the ease in farming .It works on electrical energy. It includes number of sensors to test the soil parameters, they are as follows: Temperature Sensor. Soil moisture, Water level and Light etc. The main advantage is it has automatic operated covering which works according to water level and temperature.

Keywords: - Sensors, Agriculture, Framing

I. INTRODUCTION

Brilliant Agriculture creating model is a constant checking framework it screen the soil properties like temperature, humidity soil moisture. It is conceivable to control numerous activities of the field distantly from anyplace, whenever by IOT. It offers a cutting edge lifestyle in which an individual will control his electronic gadgets utilizing an advanced mobile phone, it additionally offers a proficient utilization of energy. It applied in every aspect of industry, including smart agriculture, brilliant structure ecological observing, medical services transportation and some more.

II. LITERATURE SURVEY

Sensor innovation and remote organizations combination of IOT innovation has been contemplated and explored dependent on the genuine circumstance of farming framework. A joined methodology with web and remote interchanges, Remote Monitoring System (RMS) is proposed. Significant goal is to gather ongoing information of agribusiness creation climate that gives simple admittance to farming offices, for example, alarms through Short Messaging Service (SMS) and advices on climate design, crops etc.[1]

Proposed a methodology joining the benefits of the significant attributes of arising advances, for example, Internet of Things (IoT) and Web Services to build a proficient way to deal with handle the tremendous information engaged with agrarian yield. The methodology utilizes the mix of IoT and distributed computing that advances the quick improvement of rural modernization and assists with acknowledging keen answer for agribusiness and effectively settle the issues identified with ranchers. [2]

Proposed improvement of a framework which can screen temperature, mugginess, dampness and even the development of animals which may crush the yields in agrarian field through sensors utilizing Arduino board and if there should be an occurrence of any disparity send a SMS warning just as a notice on the application created for the equivalent to the rancher's cell phone utilizing Wi-Fi/3G/4G. The framework has a duplex correspondence connect dependent on a cell Internet interface that takes into consideration information review and water system planning to be modified through an android application. In light of its energy independence and ease, the framework can possibly be helpful in water restricted topographically secluded areas[3]

This framework gives a canny checking stage system and framework structure for office horticulture environment dependent on IOT. This will be an impetus for the progress from conventional cultivating to present day cultivating. This likewise gives occasion to making new innovation and administration improvement in IOT (web of things) cultivating application.

III. PROPOSED APPROACH FRAMEWORK AND DESIGN

A. Proposed Approach Framework and Design:

The proposed system is all about helping the farmers in an efficient and smart way, this project provides cost efficiency and also brings a lot of ease in farming by the use of certain functionalities ,So it is total cost effective eventually it is jumbo technology in effective price and a great investment.

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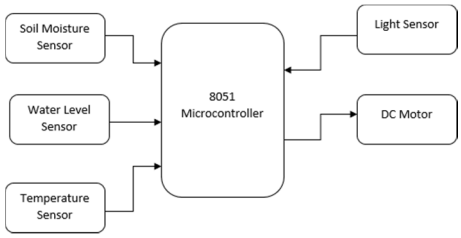
B. Proposed Architecture



C. Proposed Work

In this paper a framework for seamless integration of these components and a skilled construction exists in our System designs. Our contributions can be summarized as follows:

1) By using components all together our system has achieved efficient use of resources.
2) By using resources efficiently cost effectiveness is achieved in this system.
3) As the automated water pump is connected to the moisture level sensor and water level sensor there is no wastage of water.
4) Also the threshold value of respective crop is maintained which is responsible for quality of the crops.
5) Drip Irrigation is another great method which uses water in an efficient way.
6) The DC Motor which is connected to temperature sensor acts as a safe roof for the crops from any related damage(Excessive Sunlight and Rains).

D. Algorithm

1) Start
2) Power on circuit
3) The circuit will detect the water level , temperature and light in the field
4) If the water level is less, then water supply will immediately be started by the water pump in the field
5) The pump will automatically stop the supply after appropriate water level is completed in the field
6) Similarly,if the temperature is high or there are chances of excessive rainwater in the field,the dc motor will automatically cover the field
7) The light sensor will start working after it is dark.
8) End

IV. OBJECTIVES OF SYSTEM

As more farmers are committing suicide nowadays as they suffer huge amount of loss due to Natural calamities or lack of resources, so to overcome this problem and providing some Technology to avoid such problem, this concept is created for relief to farmers, As said earlier, our project deals with farmers and farming. Therefore, the aim of this project is to help the farmers doing economic and smart farming.

V. MOTIVATION

As more farmers are committing suicide nowadays as they suffer huge amount of loss due to natural calamities or lack of resources, so to overcome this problem and providing some technology to avoid such problem , this concept is created for relief to farmers.

VI. SYSTEM DESIGN

By using 8051 Microcontroller, Soil Moisture Sensor, Water Level Sensor, Temperature Sensor, Light Sensor, DC Motor Altogether makes this system beneficial for Farming Purpose.The Soil Moisture Sensor & Water Level Sensor works according to the water level in the field.The Water Pump is automatically operated according to the water level in the field. The Light Sensor will start working after it is dark. If there is Less/Average water level then the pump will automatically supply water to the field until appropriate amount of water is provided to the crops & then the pump stops the water supply to avoid excessive water which can damage the crops.The DC Motor is used for covering the Farm Field.

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The covering on the farm field protects the crops from high temperature & excessive rains. So if the temperature goes high above the requirement of crop, then the field will be immediately covered. LCD 16X2 is used to display various messages such as number of units available and number of appliances in use.LCD will display temperature, water level , soil moisture level. There are many advantages of this system where water is not wasted and used efficiently ,the farmer does not have to be physically present at the farm all the time. Addressable as per the requirement.

A. Hardware Used

1) 8051 micro-controller: The Board in used is 8051 microcontroller. It consists of 8kB non-volatile storage and 256 bytes of knowledge RAM.

Features

a) 0V to 5.5V Operating Range.
b) 0 Hz to 33 MHz:Fully Static Operation:
c) Three-level Program Memory Lock.
d) 256 x 8-bit Internal RAM.
e) 32 Programmable I/O Lines.
f) Three 16-bit Timer/Counters.
g) Eight Interrupt Sources.
h) Full Duplex UART Serial Channel.
i) Low-power Idle and Power-down Modes.
j) Interrupt Recovery from Power-down mode.
k) Watchdog Timer.
l) Dual Data Pointer.
m) Power-off Flag.

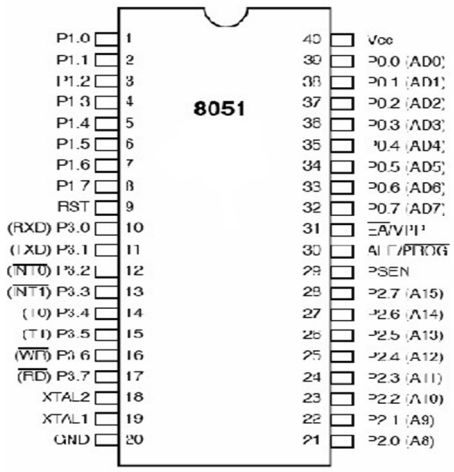

Fig: -8051micro-controller

2) LM35: LM35 is a temperature sensor that yields a simple sign which is corresponding to the quick temperature. The yield voltage can undoubtedly be deciphered to get a temperature perusing in Celsius. The benefit of lm35 over thermistor is it doesn't need any outer alignment. Least and Maximum Input Voltage is 35V and - 2V individually. Normally 5V.

Fig: LM35

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3) *Soil Moisture:* The Soil Moisture Sensor utilizes capacitance to gauge dielectric permittivity of the encompassing medium. In soil, dielectric permittivity is a component of the water content. The sensor makes a voltage corresponding to the dielectric permittivity, and thusly the water substance of the dirt.

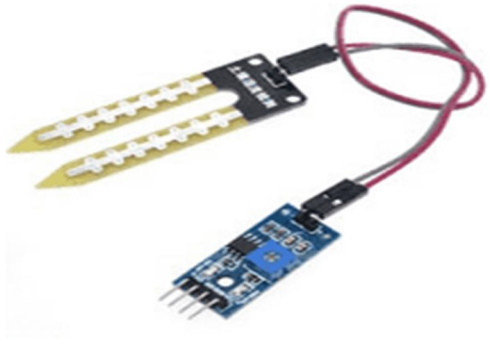

Fig:- Soil Sensor

4) *DC Motor:* A DC motor is a precisely commutated electric engine powered from direct motor (DC). The stator is fixed in space by definition and hence so is its current. The current in the rotor is exchanged by the commutator to likewise be fixed in space. This is the way the relative point between the stator and rotor attractive transition is kept up close to 90 degrees, which creates the most extreme force. The speed of a DC motor can be constrained by changing the voltage applied to the armature or by changing the field current. The presentation of variable obstruction in the armature circuit or field circuit permitted speed control. Current DC motor are frequently constrained by power gadgets frameworks called DC drives.

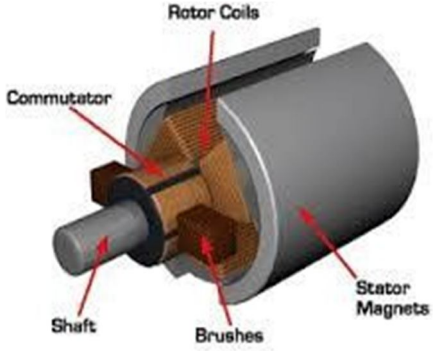

Fig: - DC Motor

5) *LCD (Liquid Crystal Display):* LCD 16X2 is used to display various parameters such as temperature , soil moisture and water level.

Fig . LCD

a) *Modules Used:* This Project focuses on reducing the efforts of farmer by using various sensors. Temperature Sensor will display the temperature of field on LCD screen .The water pump will be operated automatically according to the water level in field so it will be very efficient for farmer. There is automated field covering using DC Motor which makes the crop undamaged. By the use of Drip Irrigation water will be used efficiently without any wastage.

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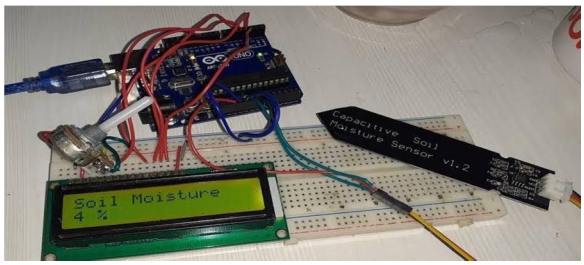
VII. RESULTS OF PRACTICAL WORK



According to the soil moisture level in the field (which depends on threshold value of crop).The Soil Moisture Sensor will take the respective readings and display it on LCD Screen.

Similarly, the Water Level Sensor will record the respective water level readings which will be displayed on the LCD Screen.

Actual Image of Soil Moisture Sensor.

Actual Image of Water level Sensor.

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LM-35 Temperature Sensor is connected to DC Motor which when temperature goes excessive, commands dc motor to cover the roof ,and displays the temperature on LCD screen.

VIII. CONCLUSION

Entire project is about Farming and its techniques. This project will reduce the farmer's suicides and help them with the cost and save them from any more destroyed crops. The initiated project is not too much expensive and the whole cost can be recovered in 3 year period. So it is total cost effective eventually it is jumbo technology in effective price and a great investment

IX. FUTURE SCOPE

Further many additions can be made into this product which we thought of but couldn't make as it would increase the overall cost of the product as well as the size. The android application might be a bit simpler and easy to understand. In future if this product is given right directions into manufacturing and a nicer attractive look, it would be very useful for all the farmers to do efficient farming.

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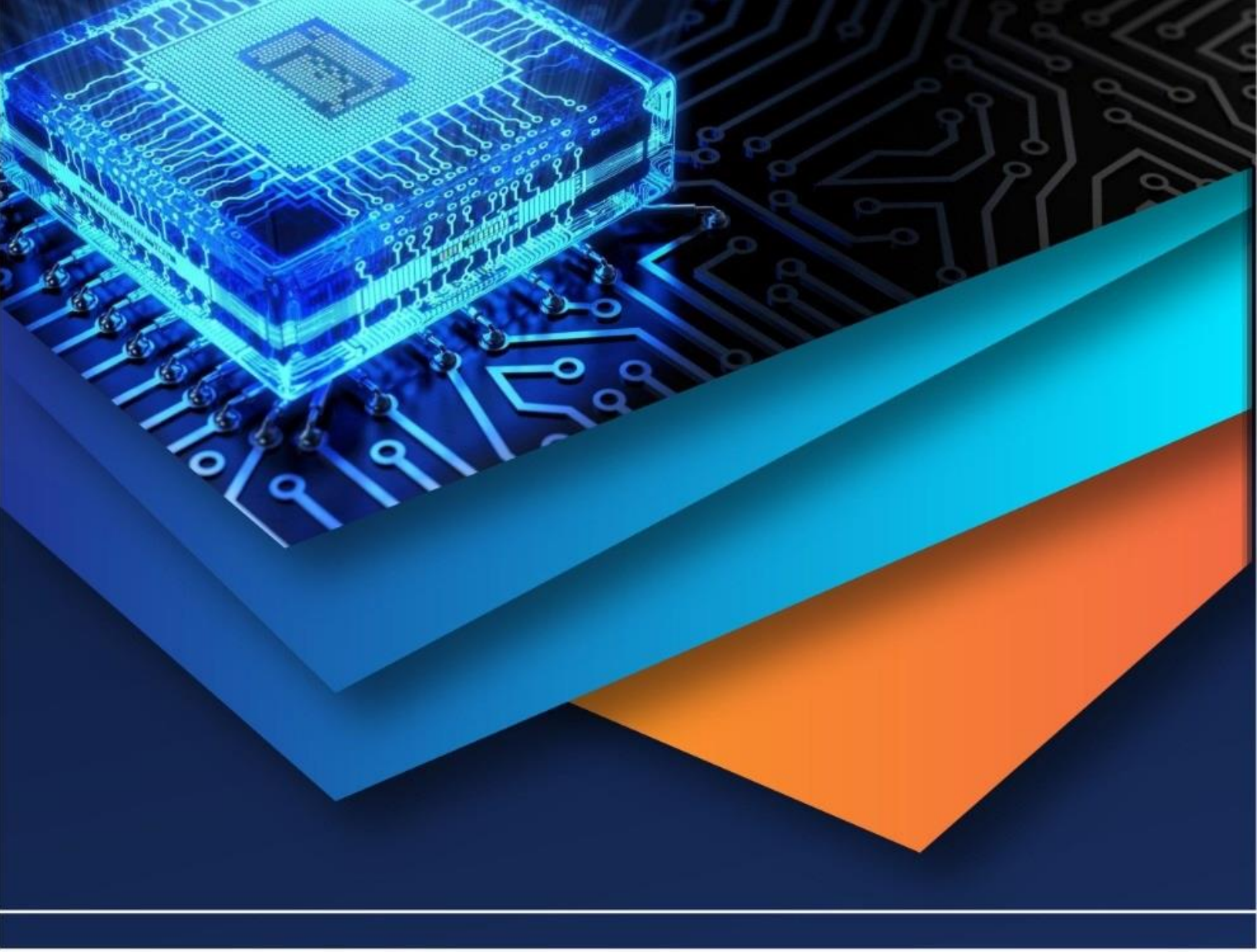

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