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# DEVELOPMENT OF AN IOT BASED DATA ACQUISTION & AUTOMATIC IRRIGATION SYSTEM FOR PRECISION AGRICULTURE

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## ABSTRACT
Agriculture has benefited greatly from improvements in Internet of Things based technology. Farm data can be sent to farmers in real-time through the advent of Internet of Things based technology which integrates data collection, transmission, storage and other essential components that provide for great user experience. This work involves the development of a system that enable the transmission of sensor field data to the Internet, via a microcontroller, a transceiver and a Wi-Fi module. In this work, an Internet of Things based data acquisition and automatic irrigation system for precision agriculture was designed and implemented using Arduino Uno, Soil Moisture and Temperature sensors, Proteus design suite, and the Arduino integrated development environment software. The significance of this work is evident as it, enables farmers perform specified functionalities at the comfort of their home, minimize wastage of water during irrigation and most importantly reduce the maintainability cost of the farm through minimal physical supervision. This work also elicits requirements for better improvements on the IoT-based data acquisition and automatic irrigation system.

## INTRODUCTION
The advancement of Internet of Things-based technology has had a significant positive impact on agriculture. With the development of Internet of Things-based technology, which combines data gathering, transmission, storage, and other crucial elements that offer a wonderful user experience, agricultural data can be sent to producers in real-time. Through the use of a microprocessor, a transceiver, and a Wi-Fi module, a system to allow the transfer of sensing field data to the Internet is being developed in this study. This work used the Arduino Uno, Soil Moisture and Temperature sensors, Proteus design tools, and the Arduino Integrated Development Environment software to create and execute an Internet of Things based data collection and automated watering system for precision agriculture. The importance of this effort is clear because it allows producers Proteus design suite, and the Arduino integrated development environment software. The significance of this work is evident as it, enables farmers perform specified functionalities at the comfort of their home, minimize wastage of water during irrigation and most importantly reduce the maintainability cost of the farm through

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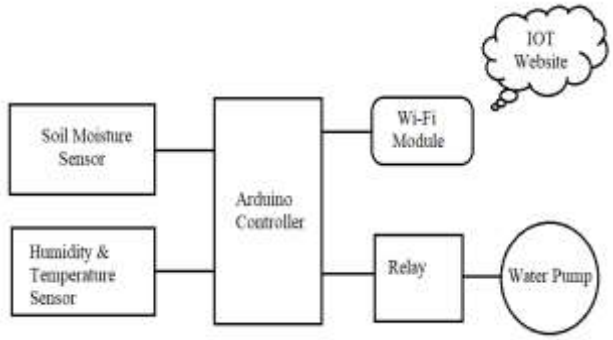


Fig.1: Block Diagram

IoT stands for Internet of Things. It refers to the interconnectedness of physical devices, such as appliances and vehicles, that are embedded with software, sensors, and connectivity which enables these objects to connect and exchange data.This technology allows for the collection and sharing of data from a vast network of devices, creating opportunities for more efficient and automated systems.Internet of Things (IoT) is the networking of physical objects that contain electronics embedded within their architecture in order to communicate and sense interactions amongst each other or with respect to the external environment.In the upcoming years, IoT-based technology will offer advanced levels of services and practically change the way people lead their daily lives.Advancements in medicine, power, gene therapies, agriculture, smart cities, and smart homes are just a very few of the categorical examples where IoT is strongly established.IoT is network of interconnected computing devices which are embedded in everyday objects, enabling them to send and receive data.Over 9 billion 'Things' (physical objects) are currently connected to the Internet, as of now. In the near future, this number is expected to rise to a whopping 20 billion.

**PROPOSED SYSTEM**

A variable regulated power supply, also called a variable bench power supply, is one where you can continuously adjust the output voltage to your requirements. Varying the output of the power supply is the recommended way to test a project after having double checked parts placement against circuit drawings and the parts placement guide.

This type of regulation is ideal for having a simple variable bench power supply. Actually this is quite important because one of the first projects a hobbyist should undertake is the construction of a variable regulated power supply. While a dedicated supply is quite handy e.g. 5V or 12V, it's much handier to have a variable supply on hand, especially for testing.

Most digital logic circuits and processors need a 5 volt power supply. To use these parts we need to build a regulated 5 volt source. Usually you start with an unregulated power supply ranging from 9 volts to 24 volts DC (A 12 volt power supply is included with the Beginner Kit and the Microcontroller Beginner Kit.). To make a 5 volt power supply, we use a LM7805 voltage regulator IC (Integrated Circuit). The IC is shown below.

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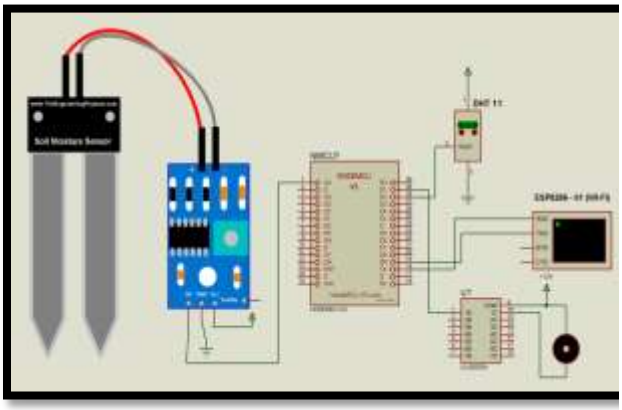
**CIRCUIT DIAGRAM**



**RESULTS**

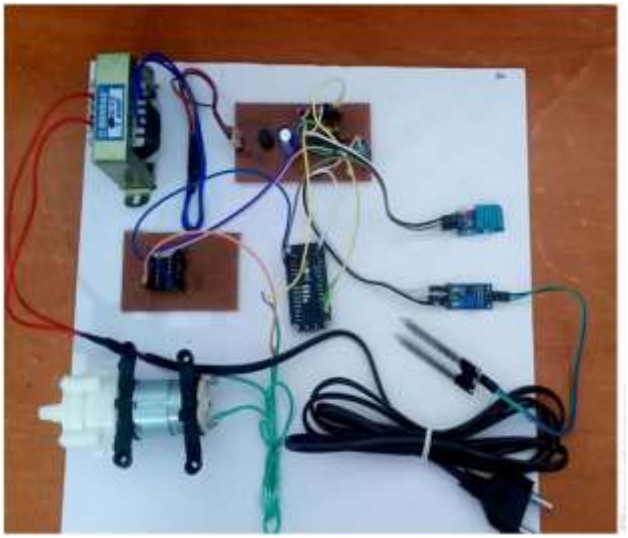
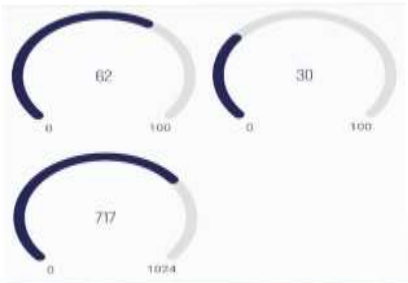


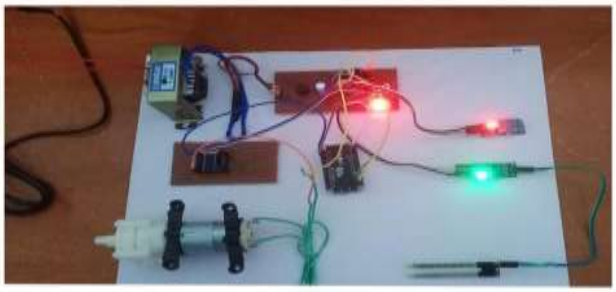
Fig.2: PHOTO COPY OF THE PROJECT

Any invention of latest technology cannot be activated without the source of power. So in this fast moving world we deliberately need a proper power source which will be apt for a particular requirement. All the electronic components starting from diode to ics only work with a DC supply ranging from 5V to 12V.We are utilizing for the same, the cheapest and commonly available energy source of 230V-50Hz and stepping down, rectifying, filtering and regulating the voltage.

When soil moisture is dipped in soil if the moisture level is enough ,the motor will will turned off and corresponding are the readings of humidity ,temperature and moisture sensors are recorded.


When soil moisture sensor is placed in soil If there is no enough amount of moisture ,the motors turns on and corresponding readings are recorded and displayed in BLYNK app.



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**ADVANTAGES**

- To save water.
- It distributes water through irrigation ditches,letting gravity to do work.
- Uses local soil moisture data drawn from sensors in the ground to support informed decisions about watering schedules.
- Contolling the soil moisture in the soil according to the crops cultivated.
- Farmers can easily monitor the data from home.
- Data acquisition from soil moisture sensors and DHT11 sensors and updating the data to the server.
- Data canbe easily accessible from Blynk app supported for both android and ios.

**DISADVANTAGES**

- Smart Agriculture need availability of Internet continuously .
- Rural parts of the developing countries did not fulfill this requirements .Moreover Internet s slower.
- Fault sensors or data processing engines can cause faulty decisions which may lead to over use of water ,fertilizers and other wastage of resources.

**APPLICATIONS**

- It can be used for small,residential landscapes as well as for large landscapes.

**CONCLUSION**

I conclude that this system is easy to implement and time, money and manpower saving solution for irrigating fields.A farmer should visualize his agricultural land's moisture content from time to time and water level of source is sufficient or not. IOT based smart irrigation system displays the values of the sensors continuously in smart phone or on computer's web page and farmer can operate them anytime from and anywhere.

**FUTURE SCOPE**

The smart irrigation system is feasible and cost effective for optimizing water resources for agricultural production.This irrigation system allows cultivation in places with water scarcity thereby improving sustainability. It proves that the use of water can be diminished. The use of solar power in this system is significantly important for organic crops.

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