



MIT School of Engineering

Department of Computer Science and Engineering

Mini Project Synopsis

Group No. : 08

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Project Title : **Smart Agriculture System Based on IoT**

Group Members :

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I . Introduction :

Smart Farming is a farming management concept using modern technology to increase the quantity and quality of agricultural products. Farmers in the 21st century have access to GPS, soil scanning, data management, and Internet of Things technologies.

II . Problem Statement :

- Farmers are under pressure to produce more food AND use less energy and water in the process. A remote monitoring and control system will help farmers deal effectively with these pressures.
- To provide efficient decision support system using wireless sensor network which handle different activities of farm and gives useful information related to farm field to farmer.

III . Abstract :

Smart Agriculture system is an aborning topic in this materialistic world. This paper describes the concept of featuring and elasting an agriculture platform to the internet world. Agriculture is the most important of human life so it can be improvised by using IoT technology. IoT technology gives a grasp to enhance the power of automation systems in agriculture. Smart agriculture System that uses the advantages of cutting-edge technologies such as Arduino and Wireless Sensor Network. This paper proposes the concept and features of the sensor world in the internet of things for agriculture which is used to enhance the production of crops. The Agriculture stick being proposed through this paper is integrating with Arduino Technology, Breadboard and mixed with different various sensors and live data feed can be obtained online through mobile phone. India Monitoring environmental conditions are the major factor to improve the yield of efficient crops. The feature of this paper includes the development of a system that can monitor temperature, humidity, moisture, and even the movement of animals which may destroy the crops in agricultural fields through sensors using Arduino board. With its energy autonomy and low cost, the system has the potential to be useful in water-limited geographically isolated areas.

IV . Components

- a) Raspberry Pi : Raspberry Pi is a series of small single-board computers (SBCs) developed in the United Kingdom by the Raspberry Pi Foundation in association with Broadcom. The Raspberry Pi project originally leaned towards the promotion of teaching basic computer science in schools and in developing countries.



- b) Sensors :
- Soil Moisture Sensor
 - Water level Sensor
 - Temperature Sensor
 - Humidity Sensor ,etc

c) Arduino UNO : Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs. The microcontrollers can be programmed using the C and C++ programming languages, using a standard API which is also known as the Arduino Programming Language, inspired by the Processing language and used with a modified version of the Processing IDE.



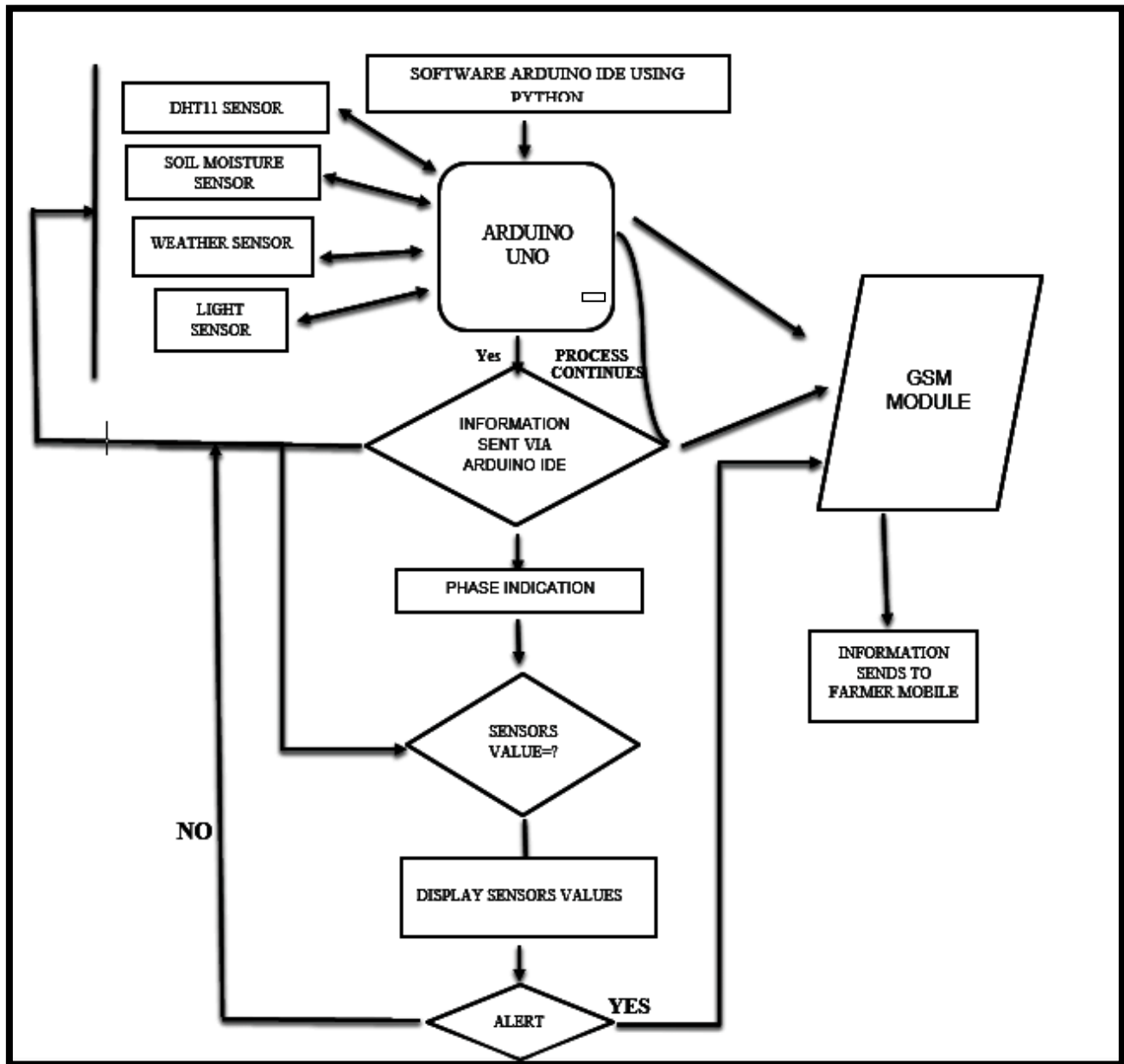
V . Benefits of IoT Technology in Agriculture :

- IoT enables easy collection and management of tons of data collected from sensors and with integration of cloud computing services like Agriculture fields maps, cloud storage etc.data can be accessed live from anywhere and everywhere enabling live monitoring and end to end connectivity among all the parties concerned.
- IoT is regarded as key component for Smart Farming as with accurate sensors and smart experts .
- With IoT productions costs can be reduced to a remarkable level which will in turn increase profitability.
- With IoT , various factors would also lead to the protection of environment.
- With IoT , efficiency level would be increased in terms of usage of Soil, Water, Fertilizers, Pesticides etc.

VI . IoT and Agriculture

Year	Data Analysis
2000	525 Million Farms connected to IoT
2016	540 Million Farms till date are connected to IoT
2035	780 Million Farms would be connected to IoT
2050	2 Billion Farms are likely to be connected to IoT

VII. Block Diagram :



VIII. Literature Survey :

- Zuraida Muhammad, Muhammad Azri Asyraf Mohd Hafez, Nor Adni MatLeh, Zakiah Mohd Yusoff , Shabinar Abd Hamid [1] The term "Internet of Things" refers to the connection of objects, equipment, vehicles, and other electronic devices to a network for the purpose of data exchange (IoT). The Internet of Things (IoT) is increasingly being utilised to connect objects and collect data. As a result, the Internet of Things' use in agriculture is crucial. The idea behind the project is to create a smart agriculture system that is connected to the internet of things. The technology is combined with an irrigation system to deal with Malaysia's variable weather. This system's microcontroller is a Raspberry Pi 4 Model B. The temperature and humidity in the surrounding region, as well as the moisture level of the soil, are monitored using the DHT22 and soil moisture sensor. The data will be available on both a smartphone and a computer. As a result, Internet of Things (IoT) and Raspberry Pi-based Smart Agriculture Systems have a significant impact on how farmers work. It will have a good impact on agricultural productivity as well. In Malaysia, employing IoT-based irrigation systems saves roughly 24.44 percent per year when compared to traditional irrigation systems. This would save money on labour expenditures while also preventing water waste in daily needs.

- Divya J., Divya M.,Janani V. [2] Agriculture is essential to India's economy and people's survival. The purpose of this project is to create an embedded-based soil monitoring and irrigation system that will reduce manual field monitoring and provide information via a mobile app. The method is intended to help farmers increase their agricultural output. A pH sensor, a temperature sensor, and a humidity sensor are among the tools used to examine the soil. Based on the findings, farmers may plant the best crop for the land. The sensor data is sent to the field manager through Wi-Fi, and the crop advice is created with the help of the mobile app. When

the soil temperature is high, an automatic watering system is used. The crop image is gathered and forwarded to the field manager for pesticide advice.

- G. Sushanth, and S. Sujatha [9] Smart agriculture is a novel concept since IoT sensors can offer information about agricultural regions and then act on it based on user input. The purpose of this study is to develop a smart agricultural system that utilises cutting-edge technologies such as Arduino, Internet of Things, and wireless sensor networks. Through automation, the research tries to take use of emerging technologies such as the Internet of Things (IoT) and smart agriculture. The capacity to monitor environmental factors is a critical component in increasing crop efficiency. The purpose of this study is to develop a system that can monitor temperature, humidity, wetness, and even the movement of animals that might damage crops in agricultural areas using sensors, and then send an SMS notification as well as a notification on the app developed for the same to the farmer's smartphone via Wi-Fi/3G/4G if there is a discrepancy. The system uses a duplex communication link based on a cellular Internet interface, which allows data inspection and irrigation schedule to be changed using an android app. Because of its energy independence and inexpensive cost, the gadget has the potential to be useful in water-scarce, geographically isolated areas.

IX. Reference :

- "Smart Agriculture System using IoT Technology" Publisher: International Journal of Advance Research in Science and Engineering (2319-8354) SEPTEMBER 2020
 - A Literature Survey on Smart Agriculture Monitoring and Control System Using IOT <https://doi.org/10.22214/ijraset.2022.40512> FEBRUARY 2022
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- IoT Based Smart Agriculture System JANUARY 2021
<https://www.researchgate.net/>
 - Zhang, L., Dabipi, I. K. And Brown, W. L, "Internet of Things Applications for Agriculture". In, Internet of Things A to Z: Technologies and Applications, Q. Hassan (Ed.), 2018.
 - "A RESEARCH PAPER ON SMART AGRICULTURE USING IOT ”
International Research Journal of Engineering and Technology (IRJET) JULY-22

X . Conclusion :

Thus, this system avoids over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action can be changed according to the situation (crops, weather conditions, soil etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses can be irrigated. Thus, this system is efficient when compared to other type of automation system. In large scale applications, high sensitivity sensors can be implemented for large areas of agricultural lands.

XI . Future Scope :

Future work would be focused more on increasing sensors on this system to fetch more data especially with regard to Pest Control and by also integrating GPS module in this system to enhance this Agriculture IoT Technology to full-fledged Agriculture Precision ready product.

