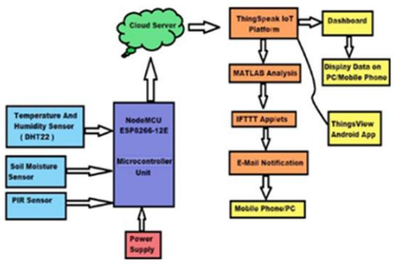
IOT based Smart Farming

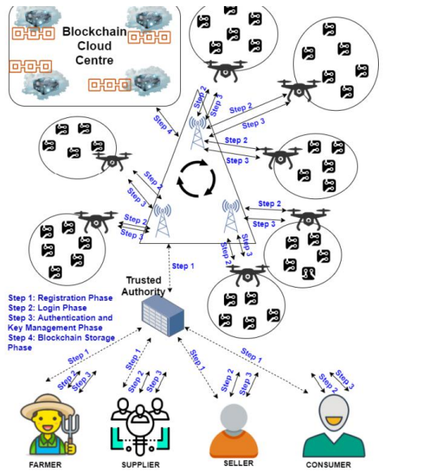
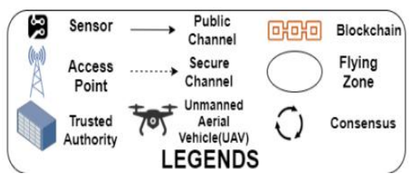
SUBMITTED BY

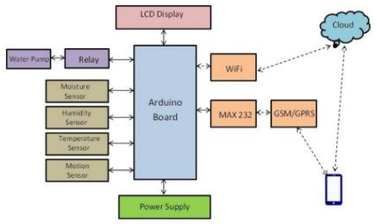
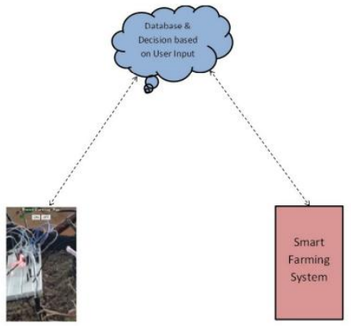
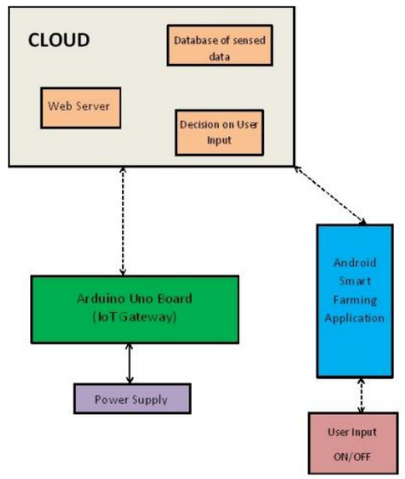
VARUN PRASAD. K	**(113219041128)**
RAMAKUMAR. B	**(113219041093)**
SOMANATH. S	**(113219041113)**
LAKSHMI NARAYANAN. VR	**(113219041055)**
PAVAN KUMAR. VV	**(113219041081)**

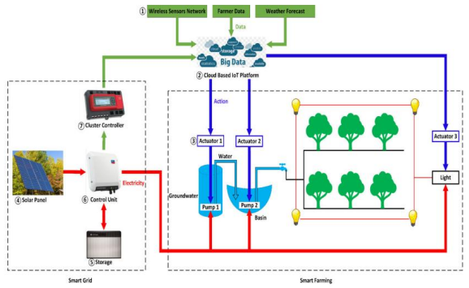
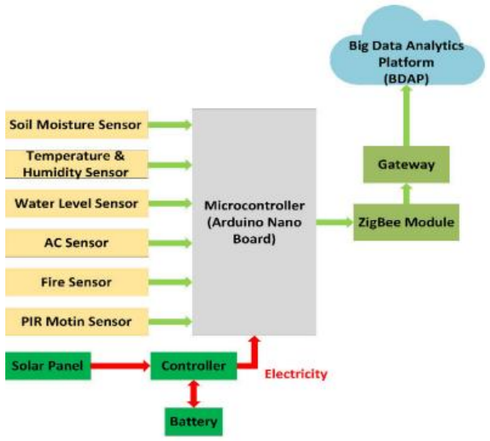
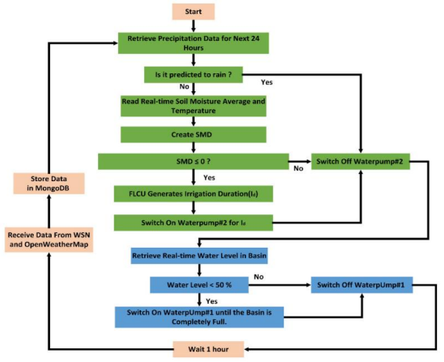
BACHELOR OF ENGINEERING IN ELECTRONICS AND COMMUNICATION ENGINEERING

Literature Survey

S. no	Block Diagram	Algorithm/ Solution	Output	Features	Drawbacks
1		**Hardware Requirements** • Soil moisture sensor, DHT22 sensor, HC-SR501: PIR sensor are used to detect temperature, pressure and motion of the object. • NodeMCU ESP8266-12E are used in IOT platforfm. **Software Requirements** • Ardunio IOT is used for programming in C. • Thing Speak Cloud Platform is used to store data	• The process of irrigation is one of the most time-consuming activities in farming. • IoT technology made the monitoring of agricultural parameters are easier, automatic, effective and real-time. • Various sensors are embedded to upgrade the irrigation system. In this paper, a smart irrigation system based on the cloud is implemented successfully.	• Accuracy • Cost efficient • Easy programed	• Soil Humidity • Cannot be monitoring plants for 24/7 • Climate detection • Water level detection

2	 	**<u>Agriculture Monitoring:</u>** ● ***Air monitoring:*** The air will be monitored. ● ***Soil monitoring:*** The soil fertility,humidity etc can be monitored. ● ***Water monitoring****:*The water level can be monitored. ● ***Livestock monitoring****:* Sensors that are placed on animals allow to check if any damage is impending on the crop due to animal livestock. ● ***Irrigation Control***: The water can be minimized. ● ***Plant Monitoring:*** The plant can be monitored 24/7. ● ***Fertilizer and Pesticides Control:*** The fertilizer and pesticides can be monitored. ● ***Illumination Control:*** Proper sunlight is used for plant's growth. **<u>Controlled Smart Greenhouse:</u>** ● The artificial environment is used for plants growth with the help of greenhouse	● In this paper, a systematic survey has been conducted on the usage and applications of blockchain technology in smart agriculture in providing security goals. ● A thorough analysis has been made on the security attributes, application areas, advantages, drawbacks, and costs of computation and communication involved in the considered existing competing schemes. ● This study has led to identification for future directions for some open and challenging problems towards which the research should be propelled.	● Cost efficiency. ● Multiple problems are solved. ● Accuracy level ● Greenhouse model is implemented at a lower cost. ● Air, soil, water, livestock, irrigation, plant, fertilizer and pesticides, illumination can be controlled.	● Power consumption is very high. ● Machine errors can happen. ● The changes occur when any of the components fails in working. ● The replacement of the failure component takes time.

3	**Hardware block diagram**  **Android Application**  **IOt Implementation**  	● This method is used to monitoring these problems 1. Temperature 2. Humidity 3. Sunshine 4. Wind speed 5. Passive infrared sensor 6. Seed monitoring 7. pesticide ● He is then allowed to select the crop for that season. System is implement in 3 ways. 1. Sensing 2. Processing 3. Information distribution ● The method was carried out using an Arduino board using IOT. The crops can be monitored, maintained and solved the problems automatically. ● The seed can be monitored, wind speed, humidity, temperature and pesticides can be monitored.	● IOT based smart agriculture systems can prove to be very helpful for farmers since over as well as less irrigation is not good for agriculture. ● Threshold values for climatic conditions like humidity, temperature, moisture can be fixed based on the environmental conditions of that particular region. ● The system also senses the invasion of animals which is a primary reason for reduction in crops. ● This system generates irrigation schedules based on the sensed real time data from field and data from the weather repository. ● This system can recommend farmer whether or not, is there a need for irrigation. ● Continuous internet connectivity is required. This can be overcome by extending the system to send suggestion via SMS to the farmer directly on his mobile using GSM module instead of mobile app	● Easily implemented ● Less time to assemble the components. ● Android application is used. ● Cloud application is used in smart agriculture. ● Monitoring can be done in mobile phones etc.	● Animals invading are not monitored. ● The climatic changes are not analysed. ● The main water consumption, that is the irrigation level of water, is not monitored. ● Plants damage and plant growth are not monitored. ● The soil fertility is not monitored. ● The rain water storage is not filled in the tank.

4	**Testbed General Architecture**  **Data flow from sensors to cloud**  **Deployed System Control Flow Diagram** 	**IOT based Smart Farming** ● Using renewable resources the agriculture problems can solved. ● The renewable resources like rain water, solar power, wind power etc are used. ● The rain water harvesting is used for irrigation purposes and the solar panels are used for collecting the solar energy and replacing the use of electricity. ● The fire, AC, PIR, water level, temperature, humidity, soil moisture sensors are used in smart agriculture. **SYSTEM ARCHITECTURE AND DESIGN** ● Data Acquisition ● Big Data Analytics Platform (BDAP) ● Wireless Actuator Network (WAN) ● Renewable Energy ● Storage Unit ● Control Unit ● Cluster Controller	● This paper developed, presented, and deployed an open source and easy-to-deploy smart agriculture system with the main drivers of cost-effectiveness, water consumption optimization, and renewable energy integration. ● The deployed SA system leverages up-to-date ICT. We used IoT devices for data acquisition and control. ● We also used Cloud Computing for data processing, visualization, and data storage. Besides, we recurred to fuzzy logic to implement a fuzzy irrigation control unit that decides on the appropriate Id based on real-time processed data. ● This approach saves water and energy and provides adequate conditions for the plants, thus optimizing crops' yield. ● Furthermore, this allows better monitoring for the water level in the basin and adheres to the conventional eco-friendly trend of sustainable agriculture through its total reliance on solar energy. ● Its ability to reduce water/energy consumption by 71.8%	● Accuracy Level. ● Usage of renewable resources. ● External power consumption can be prohibited. ● Automated process. ● Reduces human power. ● Cost efficiency. ● Easy implementation.	● Sometimes renewable resources may get failure. ● The software can also get failured. ● The hardware components can also get damaged. ● The pests and pesticides are not monitored. ● Soil fertility is not monitored. ● The system errors are made.