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Lora Based IOT Smart Irrigation System With ESP8266

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Abstract*: Writing an overview on the FDDS served the goal of comprehending the fundamentals of drifting as a means of achieving stomach retention. Both the effervescent and inertvarieties of floating tablets are created using various methods based on buoyancy principles in the production of FDDS. API which are unstable at the lower intestine environment, have a restricted absorptionwindow at the upper GIT, are less soluble in higher pH values, and are active locally can be delivered using FDDS. The technique of design in a floating single unit and several units system, the physical & formulation, and variable impacting stomach retain are all included in the development of FDDS. Reviewing numerous in-vitro and in-vivo procedures with an eye on performance and use in FDDS, the review concentrates on and summarizes these methods. When an appropriate component and gas-generating agent are included, it is possible to administer floating dosage forms in formsthat are not intended for oral administration, such as tablets and capsules. The method is helpful in solving a number of issues that came up when developing drug dosages. Along with current and unique advancements, the review paper sheds light on several strategies employed at development of floating Forms of dosage.*

Keywords: FDDS, GIT, Gastric retention, Bioavailability, prolong release, in vitro buoyancy

I. INTRODUCTION

LoRa based IoT Smart Agriculture Monitoring and Automatic Irrigation System using ESP8266 NodeMCU, ic-8051, and the new Blynk IoT 2.0 platform. Here on the sensor node, we will use the ic8051 and SX1278 LoRa-02 Transceiver module. Then we will interface multiple sensors like capacitive soil moisture sensor v1.2 to measure the quantity of water present in the soil. DS18B20 waterproof temperature sensor to measure the temperature of the soil. Similarly, In the cold season plants die due to fog and low temperature. Thus, DHT11/DHT22 Temperature & Humidity sensor is used to measure the temperature and humidity of surroundings. A 5V Single channel relay module and water Pump are used for an automatic irrigation system

II. PROPOSED SYSTEM

Smart irrigation is of the essence. Not only is smart water management necessary to save water and combat scarcity, it is necessary to help our global food system adapt to a potentially harsh and uncertain future. Smart Irrigation can also improve the quality of crops reducing the percentage of bad crops. For example, in arid regions of the Middle East, improved water management in agriculture has notably augmented both water and food security. An experimental drip irrigation project run by the Aga Khan Rural Support Program in the Syrian village of Fraytan has, for example, reduced the annual demand for water by 30 percent and increased agricultural yields by nearly 60 percent [1]. Therefore, smart irrigation systems should be implemented to monitor and control irrigation. IoT emerges as a top contender choice for actualizing a smart irrigation system that can monitor and store data from fields. Even though using IoT devices is still not optimized in many fields, IoT is emerging strongly in all sorts of fields diverging from parking systems to health care programs to even the smart irrigation field. IoT can be deployed on small to medium scales with low cost, low power connectivity, and low cloud connectivity for storage and computational capabilities which makes IoT such an attractive solution to many of todays problems. IoT refers to the billions of physical devices around the world that are now connected to the internet, collecting and sharing data. Thanks to cheap processors and wireless networks, it's possible to turn anything, from a pill to an airplane to a self-driving car into part of the IoT. This

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adds a level of digital intelligence to devices that would be otherwise dumb, enabling them to communicate real-time data without a human being involved, effectively merging the digital and physical worlds. There are already more connected things than people in the world. Analyst Gartner calculates that around 8.4 billion IoT devices were in use in 2017, up 31 percent from 2016, and this will likely reach 20.4 billion by 2020 (Figure 1.1). Total spending on IoT endpoints and services will reach almost two trillion dollars in 2017, with two-thirds of those devices found in China, North America and Western Europe, said Gartner

III. OBJECTIVE

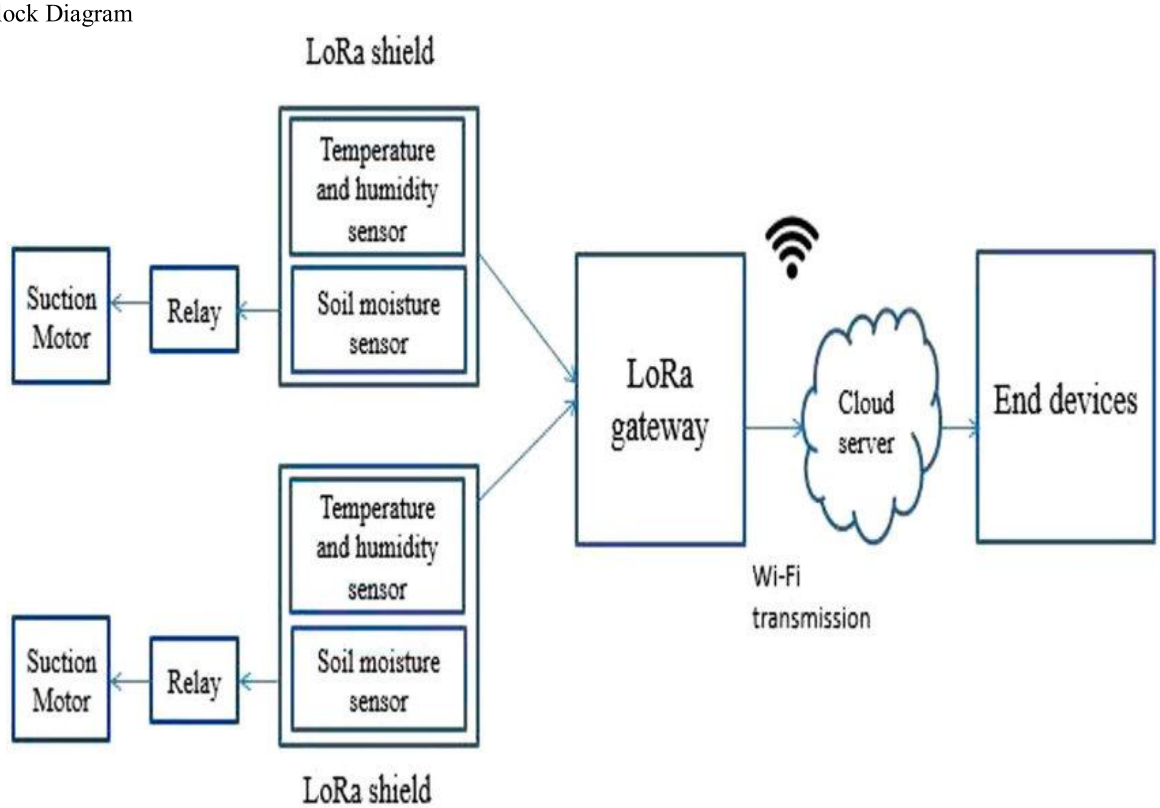
In this automated system, LoRa technology is used in Sensor and Irrigation node, in which sensors collect data on soil moisture and temperature and send it to the server through a LoRa gateway. Then the data is fed into a Machine Learning algorithm, which leads to correct prediction of the soil status.

IV. LITERATURE SURVEY

Anik Das , Ali G , Mohamed M Ahmed (2019) ; studied effect of fog weather Condition on driver lane keeping performance using the SHRP2 naturalistic driving study data. The Second Strategic Highway Research Program(SHRP2) and Naturalistic driving Study (NDS) data was used to evaluate driver lane keeping behavior in clear and foggy weather condition.The study found that individual variables such as visibility, traffic conditions, lane change, geometric characteristic, surface condition and driving experience significantly affect lane keeping ability. Visibility caused by the foggy weather condition decreases lane keeping ability significantly.

V. METHODOLOGY

Block Diagram



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Components Required

For this project, we need Arduino Nano, SX1278 LoRa Transceiver module, NodeMCU ESP8266 board, a capacitive soil moisture sensor, DS18B20 waterproof temperature sensor, DHT22 Temperature and Humidity sensor, 0.96-inch OLED display, 5 Volt single channel relay module, and a 5-volt dc pump motor. The motor is used for drawing water from the inlet and throwing water through the outlet. A pipe can be connected to it. You can purchase all these components from the Amazon link provided below

VI. LIST OF HARDWARE AND/OR SOFTWARE TOOLS

HARDWARE

S.N	COMPONENTS NAME	QUANTITY
1	NodeMCU ESP8266-12E Board	1
2	Capacitive Soil Moisture Sensor	1
3	DHT22 Temperature & Humidity Sensor	1
4	DS18B20 waterproof Temperature Sensor	1
5	0.96" I2C OLED Display	1
6	Arduino Nano	1
7	5V Single-Channel Relay Module	1
8	Few jumpers wires	20
9	LoRa SX1278 Transceiver Module	1
10	5V DC Water Pump	1

Software Tools:

- PCB wizard for PCB designing
- Protel SE99 for Circuit designing
- MPLAB IDE software
- EMBEDED ‘C’ language

VII. FUTURE WORK

There are a few future suggestions for improving this project into a business real life idea. First, the Sensor nodes need a constant renewable power source so that the placement of such nodes can be in places where there no electricity can reach. Since the sensor nodes consume low power on the long run, a small solar panel can recharge the batteries by dayto result in a self-sustained sensor node. Second, the website hosted on the central node is local, which means external control is not possible. Therefore, by using port forwarding ona wireless router can allow for control over the sensor nodes from anywhere in the world, allowing for easiness of access and diversity of users who can access. Third, the system currently is not secured from external internet attacks since it does not use authentication tokens upon logging into the website. Therefore, introducing an authentication element into the system can help with external attacks. Fourth, the sensor nodes are currentlynot protected enough from external threats such as strong wind, water, animals or even strong heat waves

VIII. CONCLUSION

A large percentage of fresh water in agricultural usage is being wasted, thus resulting in ill fresh water distribution to whoever needs it and bad irrigation that can cause soil saturation and crops growing up to be defective. Precise irrigation must be conducted in the agricultural scene. This project was designed to solve the previously stated problems by delivering on real time field monitoring as well as precise irrigation control both automated and manual. This system would allow for large scale fields to be controlled and monitored. This system provides data for future researches as for all crops conditions. By allowing the operating pages to be on home servers allows for easier trouble shoot as well as easy parts exchange with low cost. By using Lora communication, low interference long range communication low power, it is possible for the fields that are too big for other communication methods, such as Wi-Fi or XBEE or GSM

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that have low range or high power consumption, to have a smart irrigation system. Thus, using this system can solve the previously stated problems. Results showed that this system is functional and can produce the needed functions the system is implemented to perform.

REFERENCES

[1]. Sheikh, Mohr Rizwan &Sheikh, Sirajuddin & Waghmare, Santosh & Labade, Suvarna & Tekale, Anil. (2017). A Review Paper on Electricity Generation from Solar Energy International Journal for research in applied science and engineering technology.

[2]. Kabir, Ehsanul & Kumar, Pawan & Kumar, Sandeep & Adelodun, Adedeji & Kim, Ki- Hyun. (2017). Solar energy: Potential and future prospects. Renewable and Sustainable Energy Reviews.

[3]. Falvo, Maria & Sbordone, Danilo & Bayram, I. Safak & Devetsikiotis, Michael. (2014). EV charging stations and modes: International standards. 2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2014.

[4]. M, Brandl & H, Gall & M, Wenger & Lorentz, Vincent & Giegerich, Martin & Baronti, Federico & G, Fantechi & Fanucci, Luca & Roncella, Roberto & Saletti, Roberto & Saponara, Sergio & A, Thaler & Cifrain, Martin& W, Prochazka. (2012). Batteries and battery management systems for electric vehicles.

[5]. Richard Corkish, Solar Cells (Encyclopedia of Energy, 2004)

[6]. PV Technology "Photovoltaic: Sustainable Power for the World." 08 Oct 2005. [7]. Nation Center for Photovoltaics. "Turning Sunlight into Electricity." 20 Oct. 2002.

[8]. Rahmani, Fatemeh. (2018). Electric Vehicle Charger based on DC/DC Converter Topology.