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Iot based Smart Water Lifting Control as well as Tracking from Dam to Irrigation of India

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Abstract - In India water lifting is the major problem people living nearby lakes and dams use the water of lakes and dams without the permission of the government they have to go to the dams to operate the motors for water lifting similarly the amount of water to be utilized by them is more then what the government has decided for each motor. They use the electricity of irrigation offices and don't even pay the bills for electricity or service fees. So to reduce this things from happening we are creating a system consist of different IoT devices like water level sensor, relay, Raspberry Pi. This project focused on smart water lifting control as well as tracking for irrigation using IOT based model. It aims to design and develop a low cost reliable and efficient technique to improve water distribution in the Agriculture area. This has been developed using low cost embedded devices like Raspberry Pi3. A web application was created for monitoring the status of the different pumping stations as well as controlling.

Key Words: **Raspberry pi, Water level sensor, Relay, Motor, flow sensor,**

1. INTRODUCTION

The water resources are used in Agriculture. In farming most of the irrigation systems are operated manually which is not automated. The automated and semi- automated technologies been deployed for irrigation the field which has replaced the traditional farming mechanism. The available traditional methods of irrigation are drip irrigation, ditch irrigation, sprinkler system[3].

Our system is used for water lifting from the dam and this water lifting goes to the farmer's farm. We were developing the app for this system. If farmer have water for her farm then he first done the registration process then he mention her requirement like how much of water have then admin send him approved limit from her requirement and also send the payment link. User transfers the payment to the admin. All the information of user about water lifting is stored in database. Then our system request to the raspberry pi to start the relay. When relay is on motor is on and water is release from the dam. Water level sensor is used for check the water level. Admin login and checked the water level if water level below the 30% then all relay is off and send alert msg to the entire user[1].

2. LITERATURE SURVEY

1. P.C. Jain, Phaneendra Babu, Sai Sreekar Siddula " Water Level Monitoring And Management Of Dams using IoT". In this paper the water level of dam can be measured using water level sensors. The dam can be major sources for water supply for cities and the flood control of dams. For this purpose this system can be used.[2]

2. Niteen Mohod "Usability of Internet of Things for Dam Safety and Water Management ". In this paper they studied using IoT technology and wireless sensor network with software for dam safety, management and security.in this paper they can be improving functionality of dams and the situation of water Scarcity or excess water the dam safety and water management can be done.[1]

3. Yuthika Shekhar, Ekta Dugar, Sourabh Mishra "Intelligent IoT Based Automated Irrigation System". The existing Agricultural monitoring system has employed wireless sensors for monitoring the soil condition for irrigation. Also some of the system has employed mobile handset also for delivery. In none of these systems, there exists intelligence which analyses the real time data based on past experience for irrigating the field. Most of the system just captures the data from the field and accordingly controls the sprinkler valve for watering the field. In terms of machine learning, lot of research been carried out towards crop yield and crop disease prediction only[5]. There has been no research reported which employs machine learning algorithm towards analyzing the soil condition based on trained data set for irrigating the field automatically without any human intervention. Also there exists no M2M system which interacts between the system towards making analysis and predicting intelligently. So taking all the above mentioned drawbacks in the existing system, we here have developed an intelligent IoT based automated irrigation system where the temperature and moisture sensors deployed in field communicate to Arduino microcontroller[6]. The sensed moisture and temperature value is then transmitted using serial communication to Edge device called Raspberry Pi3. Raspberry Pi3 holds the machine learning algorithm called KNN (K Nearest Neighbor) classification which takes the soil moisture and temperature into consideration. The KNN (K-Nearest Neighbor) algorithm classifies the objects based on closest training examples in feature space. This is a type of

instance based learning or lazy learning where the function is approximated locally. In addition the computation is deferred until classification. This is the most fundamental and simplest classification technique where little or prior knowledge about distribution of data is needed.

4. Koushik Anand, Jayakumar C, Mohana Muthu and Sridhar A "Automatic Drip Irrigation using Fuzzy Logic and Mobile Technology". In some of the traditional irrigation system, irrigation is scheduled by monitoring the soil and water status by employing tension meter and drip irrigation by automating the controller system in sandy soil[3]. In some irrigation system, fuzzy logic controller been implemented for an efficient irrigation system for field having different crops[4].

5. Kim Y., Evans R.G. and Iversen W.M. "Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network". Research been carried out by employing Bluetooth Wireless Transmitter that sense soil moisture, temperature and accordingly send the data to the Base station (BS). The irrigation control unit which is responsible towards irrigation of the field using the sprinkler would receive the control signal from the BS. Some researchers are also working towards Variable rate Sensor based Irrigation System[3].

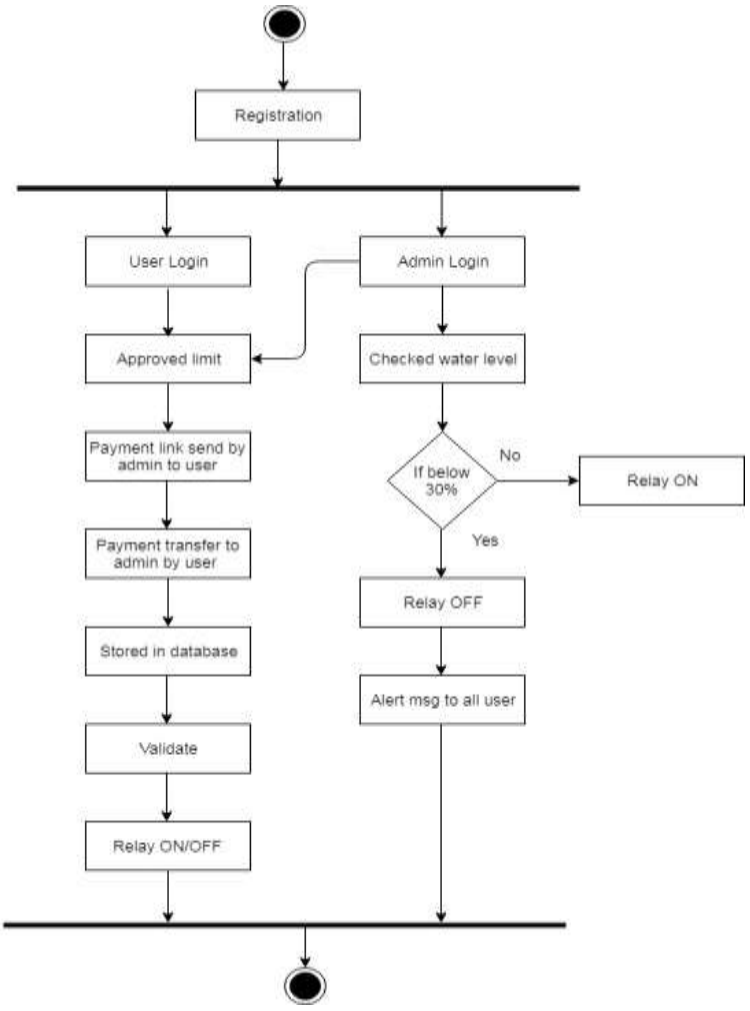
3. PROPOSED SYSTEM

We have study on water lifting problem from dam. The previous system have most of issue are occurred the previous system have mostly working manually the farmer can filled the registration form manually and the on/off the motor manually and that system flow of water cannot measure. In our system the all the problem can be overcome to using many sensor networks.

Algorithm:

- User first done the registration.
- Then login.
- User cerate her requirement about water lifting.
- For user requirement admin approved the limit.
- Admin send the payment link to the user for her requirement.
- User transfers the payment to the admin.
- This information stored in database.
- Raspberry pi send the command to relay i.e. relay ON.
- After this farmer start the water lifting from dam.
- Admin will also the login to check the water level in the dam.
- If water level in the dam is below 30% then admin OFF the all relay.

After relay OFF the alert massage is send to all users



4. SYSTEM ARCHITECTURE

Figure 1, represents proposed system architecture. Our system is used for water lifting from the dam and this water lifting goes to the farmer's farm. We were developed the Android app for this system. If farmer have water for her farm then he first done the registration process then he mention her requirement like how much of water have then admin send him approved limit from her requirement and also send the payment link. User transfers the payment to the admin. All the information of user about water lifting is stored in database. Then our system request to the raspberry pi to start the relay. When relay is on motor is on and water is release from the dam. Water level sensor is used for check the water level[1]. Admin login and checked the water level if water level below the 30% then all relay is off and send alert msg to all the users. User can also check her record about how much of water lifting. Admin monitored all the information about the water lifting of users.

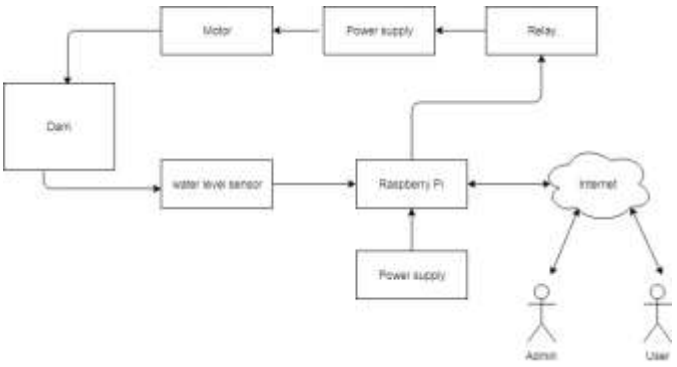


Fig. 4.1. System Architecture

4.1 Tools and Technology Used

A) Raspberry Pi

Raspberry pi is a cost skilled, close to the ground and portable period of time of personal digital assistant board. It has an arm and a leg performance ahead of the game processor. Its main ego language is Raspbian OS which can further develop or program by the agency of python language. Raspberry pi 3 has CPU 1.2 GHz BCM2836 quad-core ARM Cortex-A7 Memory, 1GB RAM. It has a 40 gape GPIO connector, micro SD. Main consider of raspberry pi is an IOT. Raspberry is compatible by the whole of IOT. All the front page new is collected by the whole of a raspberry pi and it behavior continuously and urge data receptive the cloud.

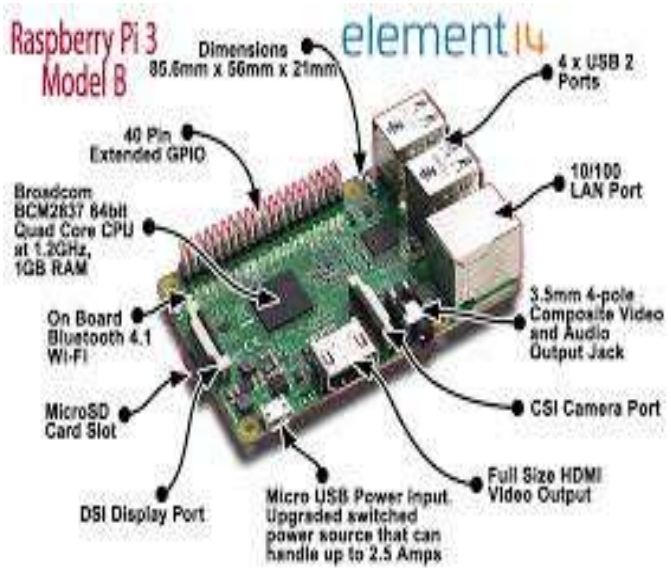


Figure 4.1.1: Raspberry pi

B) Relay

Relay is an electrically operated switch. Many relays useto operate a switch. A relay is also used for controlling a circuit by a low-power signal, or where several signals control by one cognately acts as IOT device in our system. Relay used where several circuits must be controlled by one signal.

In electromechanical relays, the coil accomplishes this function. A relays Output Circuit is the function of the relay that switches on the load and performs the same function as the electrical contacts relays.

Figure 4.1.2: Relay

C) Flow Sensor

Water flow sensor made of a plastic valve body, a water-rotor, and a hall-effect sensor. When water flows through the rotor, rotor rolls. Its speed changes with different rate of flow of water. The hall-effect sensor outputs the corresponding pulse Signal.

Figure 4.1.3: flow sensor

C) Water level sensor

Water level sensors are used to detect the level of water from particular substance. Such substances include liquids, granular material and powders. Level measurements can be the level of a river or lake.

Figure 4.1.4: water level sensor (float switch)

C) PCB and wires

A printed circuit board (PCB) it can be electrically connects electronic components or electrical components using conductive tracks, pads and other features etched from one or more sheet layers of copper laminated to the other sheet layers

Wire is a single electrical conductor, where as a cable is a group of wires swathed in sheathing. The cable originally used to a nautical line of number of ropes used to anchor ships, and in an electrical context, cables are used to carry electrical currents.

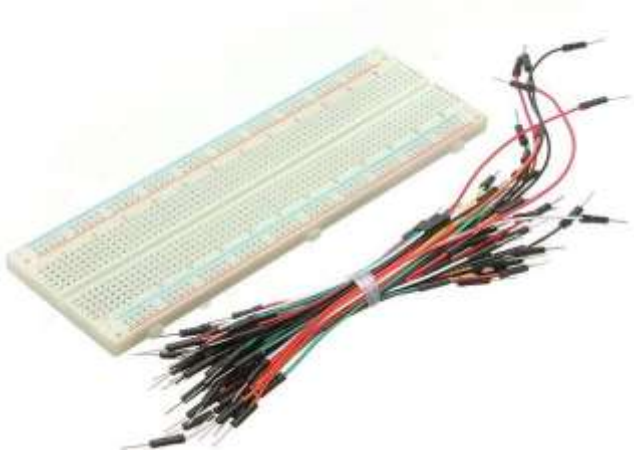


Figure 4.1.5: PCB and wires

EXPERIMENTAL RESULT

In the proposed system are gather information from the sensors like a water level sensor, flow sensor, relay. The water level sensors check the water level of dam if the specific dam water level is below 30% then it directly off all the motors. The flow sensor check the flow of water to check the pressure of water for tracking the water from dam to farmers farm. The relay are used to provide current to motors.

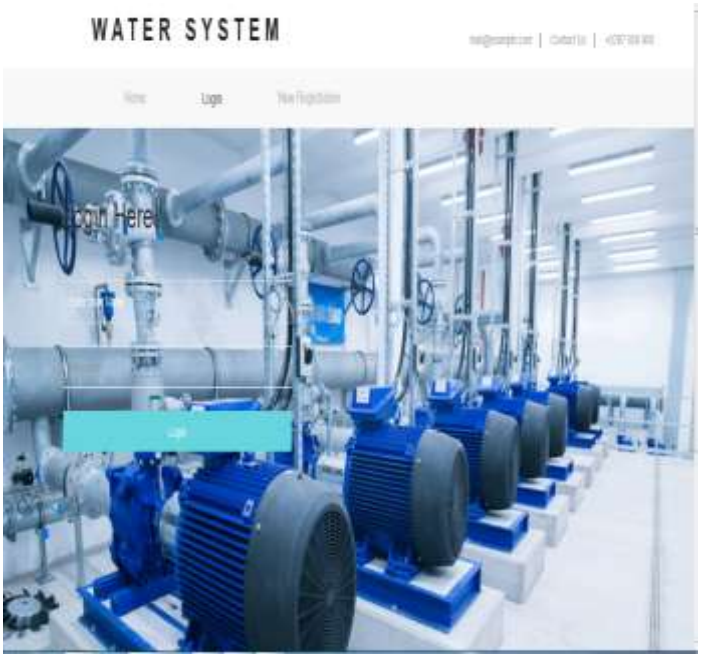


Fig.1 login page

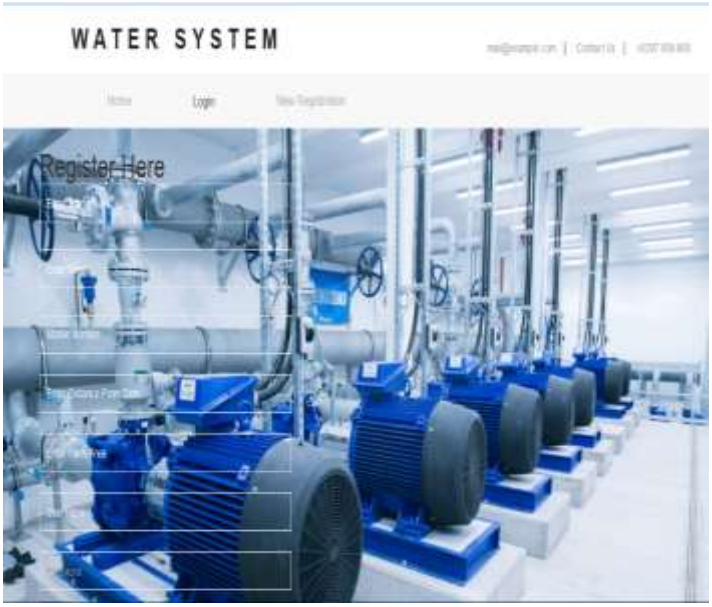


Fig.2 New user registration page

Fig.3 Hardware Setup image

CONCLUSION

In this system we are implementing the water distribution system from dam. In this system water can distributed to farmer/user automatically. It can be reduce stalling of water from unauthorized person. As we are using IOT approach its easy to user to communicate with the system which makes all the process automatic.

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