Canal Water Distribution System

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***Abstract*: As we know that now a days at canal water distribution there is a lot of corruption at water distribution points as they are managed manually and decentralized way. A key man with canal inspector is responsible for delivering water at local farmers as per their demand respectively.This demand is unofficially fulfilled by local canal inspector and key man. These government officers collect black money from those farmers to supply the water which they need.**
We are developing a computerize system which will give the proper distribution of water to the farmers and avoid this corruption. We are replacing the gate by Solenoid valve/ Hydraulic gates, which will works on the Faraday law of electromagnetism, and it is control by an computerize system. Each farmer need to register on our application by means of requirement form which is going to be online as well as offline for the farmers. As per the requirement specified by farmer the computerize system will open the valve for the time span which the farmer will request .When the time gets over the valve will close automatically and suppose due to some reason the gate was not open by computerize system, then it could be opened with the help of Android App. Due to which the gate can controlled by Web Application as well as Android App, we will notify the farmer before supplying the water to the farm with the means of message on his phone.

***Keywords*: Water, Canal Data reliability, Controlling, microcontroller, Obstacle Detection.**

INTRODUCTION

There should be change in the field of our irrigation system operational management. Only then the irrigation systems set up with enormous investments through the various five-year plans can be sustained to ensure reasonable returns. In India, it is necessary to have a computerized water distribution network for monitoring and controlling canal operation not only at operational level but at farm level also. As the farmers are the end-users, when new technology is applied, they have to be informed during implementation of the improvements planned and of the anticipated benefits which they will gain. Upgrading existing canal system operations needs to be done in stages as a rehabilitation program. It can be done in small areas which are easily and economically assessable for improvement. In Indian conditions the cost of automation on the main canals can vary from Rs 1,500 to Rs 2,000 per hectare and that on the secondary canals from Rs 3,000 to Rs 4,000 per hectare. Specific amounts of water required for crop irrigation at particular times can be derived using the soil-water plant relationship. We have soil characteristics such as water holding capacity as well as infiltration rate which can be used for calculation.

The paper is based on a technology through which the farmers as well as the public sector will get benefit as the water which is been used by the farmers will be limited and the because of which we will save water at great extent. Other than that there will be a system through which the farmers have to pay only for what they will be using. A transparency will be maintained between the users as well as the irrigation department. Because of saving the water in condition of drought there will be plenty of water available for the farmers as well as the public sectors. The paper is helping the public who are not aware of the digital benefits of the government will get all the benefits and they will also support the process of making India digital in different means as well as a disaster free country. Because of the online generation of bill for the water distribution there will be reduce in corruption which they used to do with the of paying more money to the key man.

1. LITERATURE SURVEY

Adria Soldevila et. All, [1] from this paper we got a new method for getting leak localization in water distribution network which uses the model based approach combined with Bayesian reasoning. This is a density function in model based pressure residuals are calibrated online for all the possible leak scenarios by using a hydraulic simulator, being leak size uncertainty, demand uncertainty and sensor noise to considered

Edwin Milton Calderon Mendoza et. all [2], This paper propose a neuro-fuzzy Smith predictor controller (NFSP) for e elective control of water distribution in an irrigation main canal, which allows to improve the efficiency and to reduce the water losses. By using the real-time data the dynamic model of this process is been obtained. A neuro-fuzzy controller combined with a Smith predictor is therefore designed which behaves robustly against the elect of external disturbance and plant dynamical parameters variations. Obtained results compare the performance of the proposed controller with a standard PI controller, also combined with a conventional Smith predictor for several operation conditions. These results show that the proposed controller out-performs the standard controller in terms of performance and robustness.

Subha Austalekshmi et. all [3], This Paper Water leakage is a significance problem in both developing and developed countries causing water loss in water distribution system. Leakage causes economic loss in the form of wastage of water, damage to pipe networks and foundations of roads and buildings, and also poses risk to public health due to water contamination. The lost or unaccounted amount of water is typically 20-30 percent of production. Some older system may loss even up to 50 percent. The water pipe network which is present at houses as well as the public places are kept hidden and hence detection of water is a big problem in such places such as efficiency being dependent on size, depth and material of pipes, need for manual inspection and repair, dependency on weather and surface conditions and effect of water pressure

Rakhel Kumar Parida et. all [4], The Paper need of water would bring major challenges for populated Wes. With the need, there comes a security concern regarding environmental issues, pollution and even the revenue. As eWes like Chennai do not have perennial sources of and doesn't have the leverage to distribute it in a massive scale. Thus the private players come into action, which uses various lakes and Bore wells in and around to full the need using trucks and Lorries. But these organizations are not properly regulated, especially the trucks with increasing amount of theft occurrences. An automated model is been prepared in this paper through which the Lorries can be monitored and thus controlling the theft.

2. PROBLEM DEFINATION

The basic requirement of the system is to improve the existing system which is a manual system. This will reduce corruption as well as the wastage of water will also be reduced. There could be possibility of leaks in the pipes as well as the canals for that we are using pressure sensor as well as density sensor. Other than that we are using the Advanced

3. PROPOSED SYSTEM

It depends on an innovation through which the ranchers just as the public area will get advantage as the water which is been utilized by the ranchers will be restricted and the in view of which we will save water at extraordinary degree. Other than that there will be a framework through which the ranchers need to pay as it were for what they will utilize. A straightforwardness will be kept up between the clients just as the water system office. Since of saving the water in state of dry spell there will be bounty of water accessible for the ranchers just as the public areas. The paper is helping the public who don't know about the advanced advantages of the public authority will get every one of the advantages and they will likewise uphold the way toward making India computerized in various methods just as a catastrophe free country. In view of the online age of bill for the water conveyance there will be diminish in defilement which they used to do with the of paying more cash to the key man.

4. METHODOLOGY

An automated water leakage detection system using wireless sensor network created along the distribution pipe based on thermal (IR) imaging. A process called thermal imaging is used to find the water leakages as it is capable of capturing the contract between hot and cold areas and it can also work in low light or dark conditions. This network has low cost, low power thermal imaging sensor and each having its own processing radio frequency transreciever unit and it can operate independent on pipe, weather or surface condition is given in this paper. For a real time base a centralized database is been updated which enables very early leakage detection and initially subsequent action can be taken to the problem. This system is a model which gives the actual cost and power impact which are made by the sensor network system.

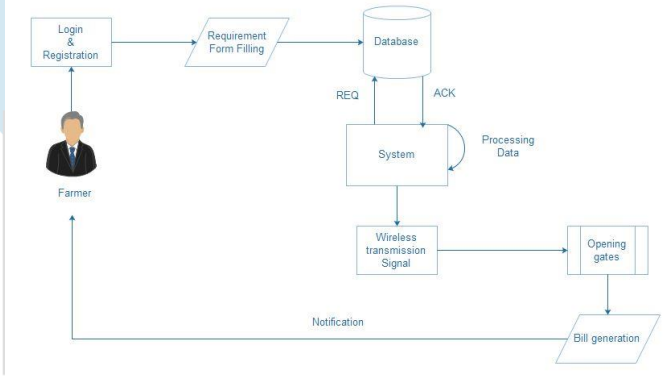

Fig -1: System Architecture Diagram

ADVANTAGES

1. Low power consumption.
2. Easy to use
3. Controlled by solaniod valve
4. Notification via SMS

5. ALGORITHM

The Advanced Encryption Standard (AES), additionally known by itso (Dutchronunciation: [ˈɾɛindaːl]), is a determination for the encryption of electronic information set up by the U.S. Public Institute of Standards and Technology (NIST) in 2001.AES has been received by the U.S. government. It overrides the Data Encryption Standard (DES). Which was distributed in 1977. The calculation depicted by AES is a symmetric-key calculation, which means a similar key is utilized for both encoding and unscrambling the information.

The Message Queuing Telemetry Transport (MQTT) is a lightweight, distribute buy in network convention that vehicles messages between gadgets. The convention ordinarily runs over TCP/IP; nonetheless, any organization convention that gives requested, lossless, bi-directional associations can uphold MQTT.[1] It is intended for associations with distant areas where a "little code

impression" is required or the organization transmission capacity is restricted. The convention is an open OASIS standard and an ISO suggestion (ISO/IEC 20922).

6. MATHEMATICAL MODEL

System Description: S = (I,O,F)
Where, S: System.
I= fAI, FI, WI, AU, AP, FU, FP, FR are set of Input
Where,
1) AI : Admin Information.
2) FI : Farmer Information.
3) WI : Water Information.
4) AU : Admin Username.
5) AP : Admin Password
6) FU : Farmer Username.
7) FP : Farmer Password.
8) FR : Farmer Requirements.

F = F1, F2, F3, F4, F5 are set of Function
Where,
1) F1 : Sensing.
2) F2 : ON-OFF canal.
3) F3 : Message sending.
4) F4 : Calculation of Water.
5) F5 : Bill Generation.

O = W, NM, OP are set of Output
1) W : Water Distribution.
2) NM : Notification Message.
3) OP : Online Payment.

CONCLUSION AND FUTURE SCOPE

This system is going to give a new way to the water distribution network through canals. Because of the use of automated system the manual work is been reduced through which we are going to avoid corruption. Leaks and flaws are also detected through sensors so it avoids wastage of water and management of canals is also very easy. Water is distributed as per the requirement of the farmers and the limitation given to them, so the water will also be saved and can be utilized by other people. Other than that it also has online payment option for the generated bill for the water they are going to use so no third person is required for the bill payment. It also has solar panels through which the electricity will also be saved. So these are the topics we are going to overcome in this system.

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