



Automatic Irrigation System Using Android Mobile: A Review

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Abstract: This paper presents an overview and an approach of automatic irrigation system using android mobile. In this paper. After a brief introduction, the focus is on literature review wherein we have studied 15 papers related to the topic and have successfully analysed and them. On the basis of the literature review, we have proposed a GSM based automatic irrigation system having promising scope. Proposed work attempts to save the natural resources available for human kind by continuously monitoring the status of the soil, the flow of water can be controlled and thereby reduce the wastage. Also, by knowing the moisture and temperature content through GSM, water flow can be controlled thereby conserving both water and labour.

Keywords: Automatic irrigation control system, android based irrigation, moisture and temperature sensors

I. INTRODUCTION

An automatic irrigation system does the work quite efficiently and with a positive impact on the place where it is installed. Once it is installed in the agricultural field, the water distribution to crops and nurseries becomes easy and doesn't require any human support to perform the operations permanently. Sometimes automatic irrigation can also be performed by using mechanical appliances such as clay pots or bottle irrigation system. It's very hard to implement irrigation systems because they are very expensive and complex in their design.

The organisation of the paper is as follows: Section 2 focuses on the literature review work I which we have mainly focused on the concept used by the authors, their performance evaluation parameters and the claims by the concerned authors. On the basis of the literature review, it is found that the GSM based approach has maximum potential and thus, we have discussed it in the Section 3 followed by the conclusion in Section 4.

II. RELATED WORK

S. N.	Ref no. authors & year	Concept used	Performance Evaluation Parameter	Claims by concerned authors
1	Pavitra D.S ,M.S.Srinath. (Aug 2014)	GSM is used to inform the user about the exact filed condition.the information is passed into the user request in the form of SMS	None	Conservation of water and labor, system& operational flexibility, this system avoids over irrigation ,under irrigation, top soil erosion and reduce the wastage of water.
2	Mr. Nilesh D.Kuchekar, Prof.R.Apagare. (9 Jun 2015)	The wireless network placed in the root zone of the plant.inaddition,WIU unit handles sensor information & transmit data to a smart phone.	Light intensity	By using zigbee technology there is no problem of line of sight. system implemented for monitoring of soil, temperature& humidity.
3	Faridtouati, Mohammed Al-Hitmi, Kamel Benhmed, Rohantabish.	For a given crop,the fuzzy logic controller acquire data from these sensor & the applies well devised fuzzy rules to produce appropriate time & duration for irrigation.	Soil moisture	Efficient set the time & duration of irrigation for a given crop. Frequent system run-off & preserving water &energy.the system enables predicting future irrigation needs.the system is easy to implement. A preliminary cost-benefit analysis shows that the system is economically justifiable.
4	Ashwini R, Kruthi P Bhaskar,K V Rakshith	This framework additionally gives a fitting message to client about the all part exercises in system .the message from the GSM is send to the client through the android portable.	None	If temperature is more than threshold value i.e more than 40 it displays temperature high on the LCD along with the voice message. if humidity is more than threshold value then it displays humidity high on the LCD along with the voice message .if water level is more in filed then it displays water level high on the along with the voice message.
5	Raul morais, Avalent& C serodio	Climate parameter such as air & soil temperature, solar radiation & relative humidity are also measured. After acquisition ,data is routed to a base station	Whether condition	Heat pulse has showed to be the most appropriate to measure humidity at different soil depths &therefore close to plant roots in non-destructive & automated manner.



		where it is stored, analyzed& use to perform local control task.		
6	muzammil hussain*, Prof. s. p. gawate	A DTMF tone command sent from a transmitting fixed or mobile phone terminal will be use to switch on/off the motor use to pump water for agriculture field.	Temperature of soil	The use of system achieves proper water management, saves time ,human power, resources& related cost required for not using a remote control system.
7	joaquin gutierrez, juan francisco villa-medina	Our system estimate weekly irrigation needs of a plantation, on the basis of both soil measurement & climatic variable gathered by several autonomous nodes deployed in field.	None	
8	Black R. D and Rogers D. H,	At any abnormal condition, the farmer is informed & will be able to take action remotely by using GSM.	None	The design system is power efficient, cost efficient & user friendly that is efficient enough to monitor the crop condition & remotely control the periphery of irrigation system which will make the job of farmer easier.
9	Pravina B. Chikankar, Deepak Mehetre	This paper design an irrigation system which is automated by using controllable parameter such as temperature, soil moisture and air humidity	Soil moisture and atmospheric condition	According to paper the farmer automatically monitor irrigation system for the crops along with controlling humidity and tempeature in his field.
10	BhagyashreeK.Chate1, Prof.J.G.Rana	The objectives of this paper were to control the water motor automatically, monitor the plant growth using webcam and we can also watch live streaming of farm on android mobiles by using wifi	None	This system comprises the live streaming of crops using android phones and automatic motor on/off system, this two systems make the irrigation fully automatic
11	Mamtapatidar, Prof .S.S.Belsare (2015)	The system has represented the wireless sensor network of soil-moisture, temperature and humidity sensor and water level sensor placed into root zone of the plant. In traditional approach to measure these factors in an agricultural environment meant individuals manually taking measurements and checking them at various times. This paper includes the monitoring of the system using zigbee and gsm.	None	These system was found to be feasible and cost effective for optimizing water resource for agriculture production.These system can adjusted to variety of crop and improve the maintenance
12	F.S. Zazueta., A. G Smajstrla and G. A Clark	This work makes the irrigation automated. With the use of low cost sensors and the simple circuitry this work aims low cost product, which can be bought even by a poor farmer.	None	They successfully develop a system that can help in an automated irrigation system by analyzing the moisture level of the ground
13	Purnima, S.R.N. Reddy, PhD	The system informs user about any abnormal conditions like less moisture content and temperature rise, even concentration of CO2 via SMS from the GSM module or by Bluetooth module to the farmer's mobile	None	The system is scalable and allows any number of different devices to be added with no major changes in its core. But it is not efficient in situations which have strong real time requirements.
14	Joaquín Gutiérrez, Juan Francisco Villa-Medina, Alejandra Nieto- Garibay	The system has a distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. In addition, a gateway unit handles sensor information,	Automated irrigation (vertical bars) triggered by the soil moisture	The automated irrigation system implemented was found to be feasible and cost effective for optimizing water resources for agricultural production. This irrigation system allows cultivation in places with water scarcity thereby improving sustainability.
15	Azzouz Benzekri, Kamal Meghriche,	The soil moisture content and the climatic parameters are monitored by a microprocessor-based data acquisition and distribution controller system under the supervision of the host computer.	Soil moisture , whether condition	An automated PC-based irrigation system which can be operated in several modes has been presented in this paper. The embedded microprocessor-based hardware with its firmware as well as the fully dedicated Delphi based graphical user interface were developed and successfully tested.

III.POSSIBLE APPROACH

The microcontroller then gives a signal to the called mobile (which is kept in the auto answering mode). The called mobile activates the buzzer.

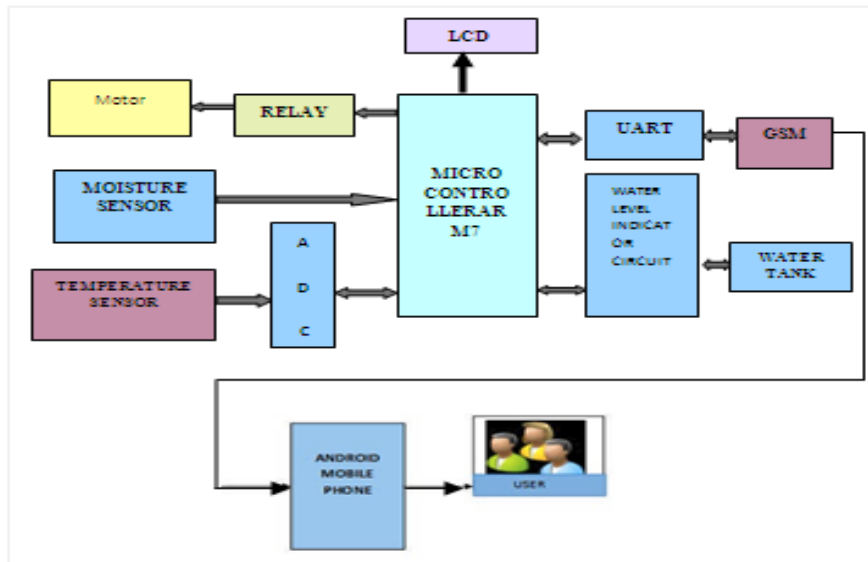


Fig. 1: Block Diagram of the Irrigation Control System

Therefore, when calling mobile calls, that buzzer is heard indicating the valve needs to be open. By pressing the button in the called function, the signal is given back to the microcontroller. The microcontroller gives signal to the valves which causes it to get open. The water is given to the root of the plant drop by drop, and when the moisture content becomes sufficient, the sensor senses this and gives back the signal to the microcontroller and the buzzer becomes off. Then by pressing the button in the calling function again, the valve is made off. The power supply needed by the controlling system is +5V. The entire unit is as shown in Fig.2.

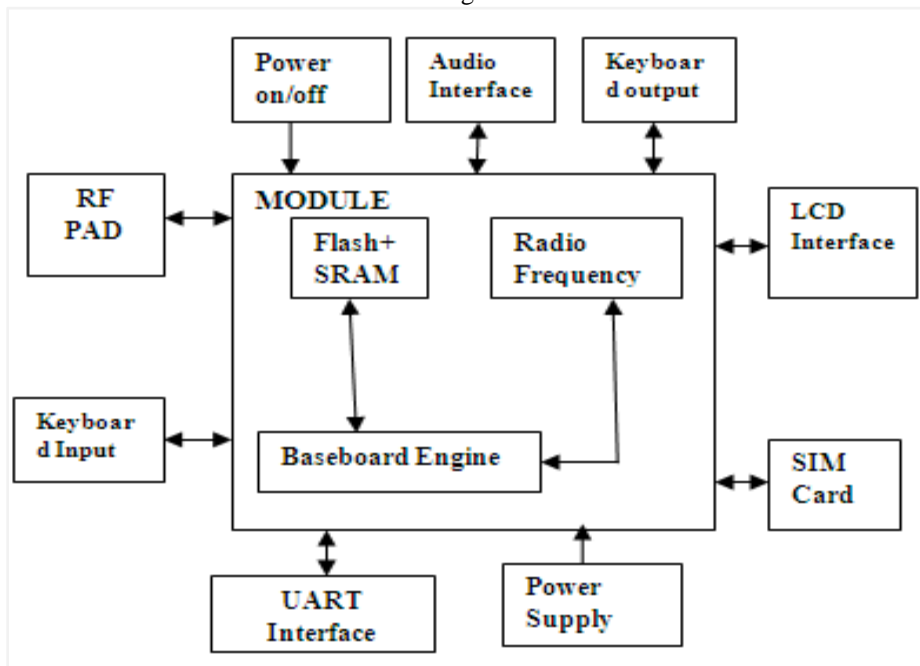


Fig.2: GSM module structure

Advantages

- 1] This system avoids over irrigation & under irrigation.
- 2] This system avoid top soil erosion & reduce the wastage of water.
- 3] The main advantage is that the systems can change according to the situation (crops , weather conditions , soil etc).
- 4] This system is cheaper and efficient for large area of agricultural lands.

Disadvantages

- 1] Absence of mobile network this system is useless



IV. CONCLUSION

Irrigation has been the backbone of human civilization since man has started agriculture. As the generation evolved, man developed many methods of irrigation to supply water to the land. In the present scenario on conservation of water is of high importance. Present work is attempts to save the natural resources available for human kind

Out of the various systems of automatic irrigation, the GSM based irrigation have found to have better applications as it 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 cheaper and 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. A stand by battery or solar cells can be implemented which comes into use in case of power cuts. A secondary pump can be used in case of failure of the pump.

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BIOGRAPHY



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