ISSN No: - 2456 - 2165

iFarm: An Intelligent Irrigation System Using Cloud and Mining Concept

Subhashree Ghosh
Department of Computer Engineering
JSPM's JSCOE, Pune University
Pune, India
subhashree.g.7@gmail.com

Mrunal Mhatre
Department of Computer Engineering
JSPM's JSCOE, Pune University
Pune, India
mrunal.mhatre.96@gmail.com

Sumaiya Sayyed
Department of Computer Engineering
JSPM's JSCOE, Pune University
Pune, India
ssumaiya001@gmail.com

Kanchan Wani
Department of Computer Engineering
JSPM's JSCOE, Pune University
Pune, India
kanchanwani18@gmail.com

Hyder Ali Hingoliwala
HOD, Department of Computer Engineering
JSPM's JSCOE, Pune University
Pune, India
ali_hyderi@yahoo.com

***Abstract*— The agriculture of our country is said to be, "the gambling of the monsoon" as the monsoon rainfalls are uncertain, crooked and uneven or unequal. This paper suggests a cost-effective and easy to use ATMEGA 32 automated irrigation system that utilize the android smart phone for remote control. Here we can handle the irrigation in three modes they are automated mode, manual mode, remote mode. This application precisely controls water system for corps by using a sensor micro controller system. It is achieved by installing sensors in the field to monitor the soil temperature and soil moisture which transmits the data to the microcontroller for estimation of water demands of plants. An android app was developed in the smart phone to operate directly the computing and connectivity components. Automation allows us to control appliances automatic control. It not only provides comfort but also reduce energy, efficiency and time saving. For communication between all the devices we are using cloud computing concept to access a cloud system via world wide web. Bayesian reasoning is used the knowledge of prior event to predict future event. The developed irrigation method removes the need for workmanship.**

***Keywords*—** *Cloud, Embedded, Android, Remote Monitoring, Wireless Sensor Network Introduction,Database.*

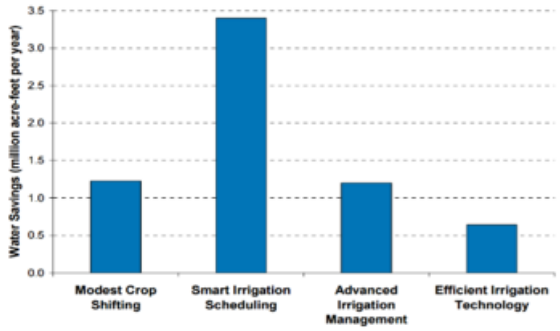
I. Introduction

Agriculture has been the spine of the Indian economy and it will continue to remain for the long time. Over 70 per cent of the rural households depend on agriculture. One-third of our National income comes from agriculture. The improvement in economy, started in the country during the early 1990s, have put the economy on a higher growth rate path. Annual growth rate in gross domestic product (GDP) has accelerated about 25%. Indian agriculture has registered impressive growth over last few decades. The growth in agricultural production has been still for the past several years. To make better use of our limited freshwater resources, cultivator need to have not only an efficient method of delivering the water to the plants, but also an efficient watering methods, so that the plants are getting right amount of water at the right time.

This system is specific for a crop and hence its water usage is limited. Proper scheduling of irrigation is critical for efficient water management in crop production, particularly under conditions of water lack. The effects of the applied amount of irrigation water and water use are particularly important. To improve water efficiency there must be a proper irrigation organized strategy. So using a micro controller to automate the irrigation and watering of crops with minimal manual interventions.

Therefore, our team, developed this smart water irrigation system to save the water feasible of the regional area, to maintain the crop fields environmental friendly by preventing soil and earth from getting dried, and, most importantly, to save economic cost of water usages for the farmers and for the whole market.Sensor-Based irrigation system has been studied in much application. These sensors send real time values to microcontroller and microcontroller send these values to PC via serial communication [1]. The system suggests an economical and easy-to-use Arduino-based automated

irrigation system that utilizes the Android smart phone for remote control. The data received by the Android smart phone from the Arduino is displayed on the User Interface [2].



II. modes

A. Manual Irrigation

Manual irrigation systems are very simple, but effective methods for making water available to crops. Manual irrigation systems are easy to handle and there is no need for technical equipment. But it is important that they are constructed correctly to avoid water loss and crop shortfall. The systems allow for high self-help compatibility and have low initial capital costs. Manual irrigation systems are easy to handle, require no technical equipment and are therefore generally cheap (in contrast to high-tech systems such as sprinkler irrigation or subsurface drip irrigation). But they need high labor inputs.

- *Operation and Maintenance*

As water is brought into the system manually, this requires high labor input. Moreover, it is important to check the systems regularly to prevent blockages and leakages. If there are any problems, it should be cleaned and/or fixed as fast as possible to prevent damages on crops. Furthermore, there are several techniques to improve the production and avoid water loss on the fields. See conservation of soil and moisture and crop selection.

- *Applicability*

Manual irrigation methods are appropriate for small-scale farming or backyard gardening irrigation in dry and arid climates where water is scarce. All the different designs reduce water evaporation. It allows people to grow its own food with simple but effective techniques.

- *Advantages*

1)Improved water-use efficiency (reduced loss through evaporation)
2)Well directed, selective and targeted irrigation
3)Ensures constant water supply in the crucial phase of germination
4)Higher yields, better quality, higher germination rate, lower incidence of pest attack
5)Facilitates pre-monsoon sowing
6)Can be constructed with locally available material
7)Low investment costs

E. Disadvantages

1)Labour intensive
2) User need a basic training to install and use the correct most of the method
3)If the water is not properly filtered and the equipment not properly maintained, it can result in clogging
4)Manual subsurface drip irrigation avoids the high capillary potential of traditional surface applied irrigation, which can draw salt deposits up from deposits below.

B. Remote Irrigation

Remote sensing techniques are becoming powerful tools for efficient management of irrigation systems in large irrigated areas. The objectives of management of irrigation systems, although they vary widely, may be defined as high crop productivity per unit land per unit applied water with equity in distribution. Some of the key elements of irrigation system management are: (i) performance monitoring and evaluation, (ii) diagnostic appraisal, (iii) action research, and (iv) farmers' participation.

- *Remote monitoring*

a) Data from gauges and sensors (soil moisture, pressure, environmental, etc.)
b) Status of farm gates and building doors (open/close)
c) Status of irrigation valves
d) Status of pumping equipment
e) Monitoring of farm and storage facilities
f) Audible or other alarms

- *Remote control*

a) Opening and closing valves & gates
b) Turning on and off fans, lights, pumps, heaters, etc.,

C. Automated Irrigation

Automatic irrigation is the use of a device to operate irrigation structures so the change of flow of water from one bay, or set of bays, to another can occur in the absence of the irrigator.

Automation can be used in a number of ways:

- to start and stop irrigation through supply channel outlets,
- to start and stop pumps,
- to cut off the flow of water from one irrigation area – either a bay or a section of channel and directing the water to another area.

- *Advantages*

1) Reduced labor:

As the irrigator is not required to constantly monitor the progress of an irrigation, the irrigator is available to perform other tasks – uninterrupted.

2) Improved lifestyle:

The irrigator is not required to constantly check the progress

of water down the bays being irrigated.

Disadvantages:

1) Cost: The automatic systems are costly in purchasing, installing and maintaining.
2) Reliability: Can the irrigator trust an automatic system to work correctly every time? Sometimes

failures will occur. Often these failures are because of human error in setting and maintaining the systems.
Increased channel maintenance: There is a need to increase maintenance of channels and equipment to ensure the system works correctly.

III. results

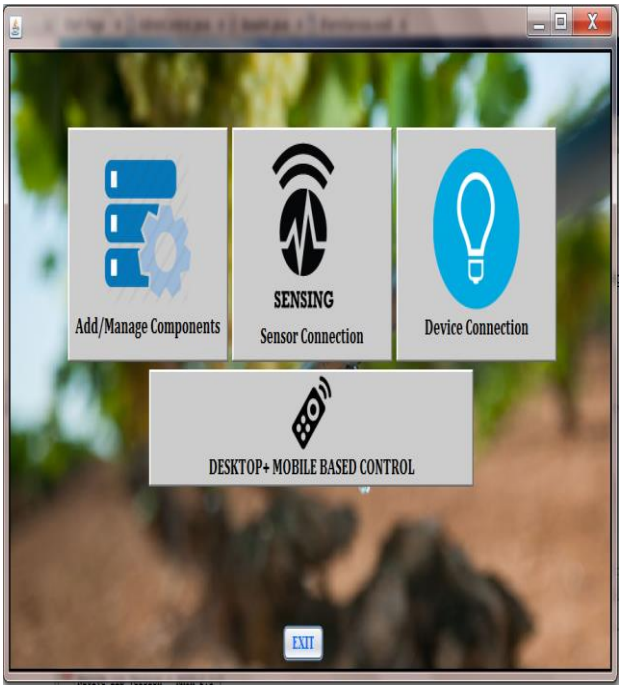


Fig1: Menu

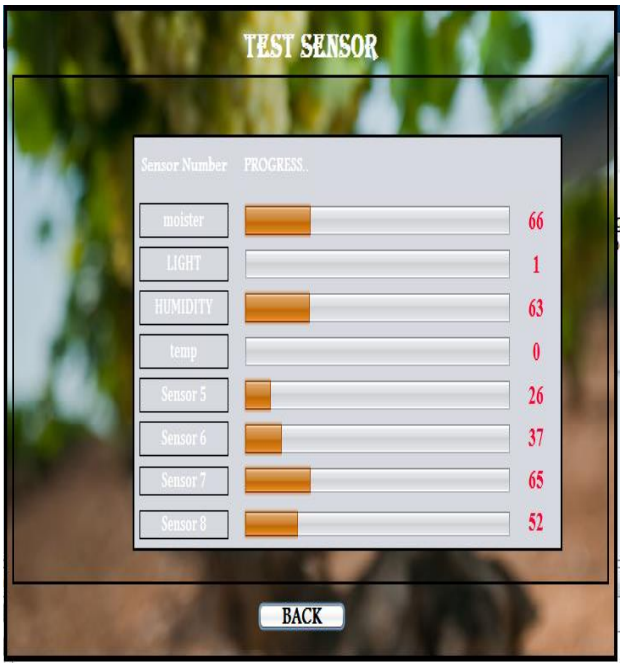


Fig2: Sensors Values

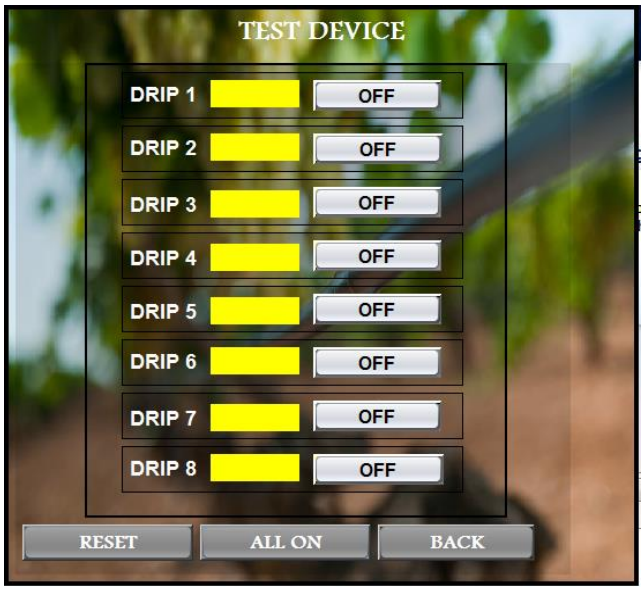


Fig3: ON and OFF of the sensors

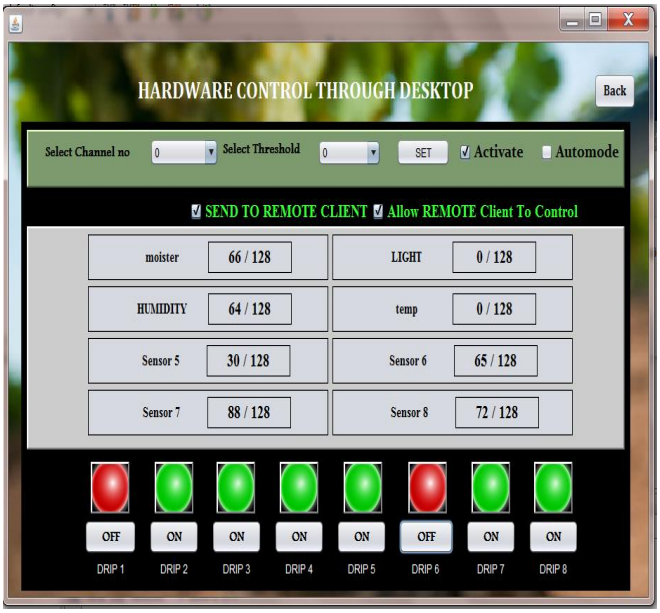


Fig 4: Remote Control

IV. CONCLUSION

The importance of optimized and efficient irrigation management system development has become the need of time especially the irrigation system that takes decisions over crops, soil, water contents and other environmental parameters.

Different nodes are used to sense temperature, air humidity and soil moisture after a defined interval of time and sent it to a central location via gateway. The irrigation management system separates temperature, air humidity and soil moisture values from each packet and check it against their defined threshold values.

ISSN No: - 2456 - 2165

Since cloud services are web-based, they work on multiple platforms, including Linux, Macintosh, and Windows computers. Smart phones, pads and tablet devices with Internet and World Wide Web access also provide cloud services to telecommuting and mobile users. Mining Concepts are used for the future prediction.

Acknowledgement

We would like to take this opportunity to thank our guide Prof. Hyder Ali Hingoliwala for giving us all the help and guidance we needed. We are really grateful to his kind support. His valuable suggestions were very helpful.

References

[1] J. Broeders, D. Croux, M. Peeters, T. Beyens, S. Duchateau, T. J.Cleij,P. Wagner, R. Thoelen, and W. De Ceuninck, "Mobile Application for Impedance-Based Biomimetic Sensor Readout," IEEE Sensors J., vol.13, no. 7, pp. 2659-2665, July 2013.

[2] Mahir Dursun and Semih Ozden, 1573-1582, April2011.Shen Jin,Song Jingling,Wanf Shengde, Remote Mea-surement and Control System forGreenhouse Based onGSMSMS, IEEE international conference on Electronicand Measurement, 2007.

[3] Xihai Zhang, Junlong Fang, Xiao Yu 2010 "Design and Implementation ofcodes Based on CC2430 for the Agricultural Information Wireless Monitoring", IEEE.

[4] AWATI J.S., PATIL V.S. (Automatic Irrigation Control by using wireless sensor networks) Journal of Exclusive Management Science – June 2012-Vol 1 Issue 6 - ISSN 77

[5] Abreu VM, Pereira LS (2002). Sprinkler irrigation systems design using ISAMim

[6] Santoshkumar; Udaykumar; R.Y. , "Development of WSN system for precision agriculture",embeded and communication system, 2015

[7] X. Wang, W. Yang, A. Wheaton, N. Cooley, and B. Moran, "E_cient registration of optical and IR images for automatic plant water stress assessment", Comput. Electron. Agricult., vol. 74, no. 2, pp.

[8] Mark E. Casada, P.E.,"Wheat Moisture Measurement With A Fringing Field Capacitive Sensor", USDA ARS Grain Marketing and Production Research Center Manhattan

[9] Shen Jin, Song Jingling, Han Qiuyan,Wang Shengde, Yang Yan," School of Electric and Electronic Engineering"