

Dam Monitoring System Using Wireless Sensor Networks

Prof.Seema Idhate ¹,Ashish Bilapatte ²,Avinash Rathod ³,Hanuman Kalbande ⁴

¹Assistant Professor, Department of Electronics and Telecommunication Engineering,

^{2,3,4} U.G. Students, Department of Electronics and Telecommunication Engineering,

JSPM's Imperial College Of Engineering, Wagholi,Pune, Maharashtra, India

Abstract - In this project we focus on harnessing IOT in monitoring and manage the dams. Large dam are of many importance, primarily because of their use for generating electricity, but risk which is associated with it should be greatly taken into account. There is a need to daily updated information related to the dam status in order to use for dam management. An information system has been invented based on the existing systems, allowing utilization of wireless sensor networks. The goal of this project is the use of Internet of Things application within a specific system for dam safety purpose. The system must provide real time alerting in case of security parameters varies from the expected values. In the world thousands of dams are there, so security must be monitored. It is of major importance due to the fact that the collapse to such dams can harmful the millions of people. The continuous monitoring of dams via sensors and the prevention the problems. Through prediction are of vital importance for the safety of dams. Therefore, in order to determine the temperature and humidity of an environment. These temperature and humidity values coming from several sensors installed in the environment must be processed. In this study, in an effort to properly operate reliable equipment in the tunnels of dams wireless Sensor network (WSN) has been explored for adoption to improve the centralized cable-based DSM system performances. This project presents a system evaluation for wireless sensor network based Dam safety monitoring to validate the efficiency. Through the cooperation of different agents for DSM applications, the distributed wireless sensor network can automatically allocate DSM tasks. Self-organize the sensor network and combined different sensor information.

Key Words: Wireless Sensor Networks, Dam Safety Monitoring, Internet Of Things,Dams,centralized.

1.INTRODUCTION

To understand the environment better and analyse it more systematically, large-scale sensor networks consisting of network nodes that have low power consumption, limited processing and memory have drawn the interest of researchers as a result of the studies conducted. Military security, physical sensing, traffic

monitoring, industrial automation, air-traffic control, smart building practices, and supervision, and the monitoring of natural boundaries are several potentially viable applications in the realm of wireless sensor networks. There are thousands of dams in the world, the security of which must be monitored. It is of vital importance due to the fact that the damage to such dams can harm millions of people and cause the loss of cultivated areas. In the previous studies conducted for dams in relation to wireless sensor networks, piezometer sensors for the measurement of groundwater level or pore water pressure were used in an effort to monitor the status of the dam reservoir. Moreover, a similar study was conducted with the use of geophysical sensor nodes in order to assess the geophysical changes in the body of the earth-fill dam. In addition to the previous studies mentioned above, in this study the measured temperature and sensor nodes. Temperature and humidity values thus recorded were compared to the previously humidity values from different sections of the tunnels in the dam were saved through the use of wireless determined temperature and humidity threshold values. Referring to this comparison, the opening and closing of the air conditioning systems.

2.Related Work

System Architecture:

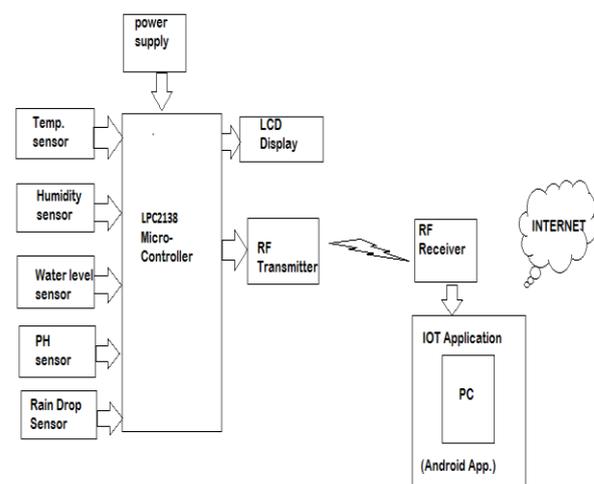


Fig 1. System architecture.

Proposed system consists of various sensors like Temp.Sensor, humidity sensor, water level sensor, PH sensor and rain drop sensor. These sensors takes actual physical quantity and this information is given to the microcontroller through wireless transmitter and according to these data LCD display shows the quantity like temperature, water level low or high etc. We have another advance options to opening of dam gates according to water level. One RF transmitter used for transmission of this information over long distance by using GSM wireless technology. At another end RF receiver is used to collect this information and given to PC and we develop one IOT Application to update this information on Internet webpage for public access for security purpose of nearer area. System will be generating immediate alert for sudden changes in water like rapid hike in water level or major change in pH values in android application.

It is very easy to use and definitely useful for preventing floods and other harms due to rapid changes in Dam water. Therefore, water level indicator designing is one of the technological advancement to transmit data and received by authority for controlling. If water level increases to dangerous level, the systems also give an alert to authority to take immediate action. The system can be used at the river-banks, low-lying areas, dam and the village far from town.

In proposed system by making use of IOT the real time water monitoring system will be developed for measuring water level and the contamination in water. Statistics as well as previous history of pH values of water and changes in water level over the time

3. Result

3.1 serial com port management:

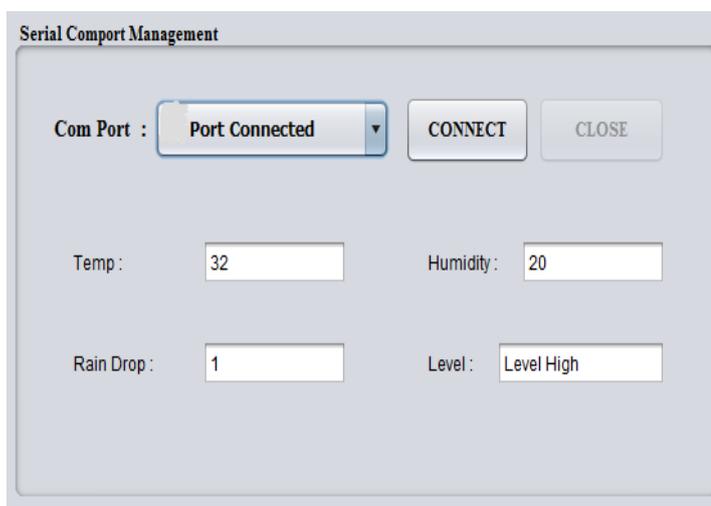


Fig.2 Port management for admin.

The data received from the various sensors to the microcontroller and we have to display this sensors data on web page with the help of java programming that we had designed. Above image shows the computer port management for connectivity from the admin side. This information and controlling is only available for admin not for users.

3.2 sensors data for user access:

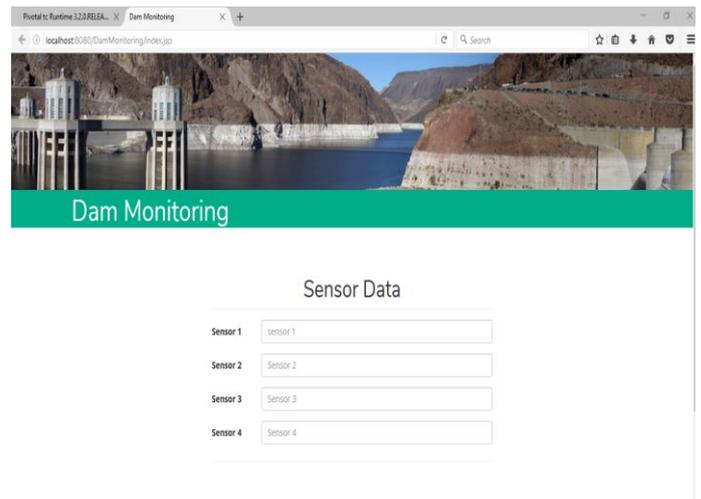


Fig.3 Sensors data for user access.

The user view of web page is as give in above image. These parameters of the dam are continuously updating with respect to time. This information is helpful to the peoples who are living in the nearer area of the dam for safety like when heavy rainfall take place at that time parameters like water level of the, and humidity and rainfall are displayed within a second on web page so chances of flood and dam breakage arrives so that peoples in the nearer area can shift to other place.

3. CONCLUSIONS

In this project the possible application of latest technologies such as internet of things, sensor ml and wireless sensors networks with software for dam safety management. Combination of these technologies and software improves functionality of dams. sensor technology, computer technology and network technology are advancing together while the demand grows for ways to connect information systems with the real world. Linking diverse technologies in this fertile market environment, integrators are offering new solutions for plant security, industrial controls, meteorology, geophysical survey, flood monitoring, risk assessment, tracking, environmental monitoring, defence, logistics and many other applications. internet of

things, as a technology that is in trend, allows sensors to become intelligent by connecting them to the internet.

Future work of this proposed system is to show how this data is updating in a database that we have created and at every second of time it is updated in table form with the help of mysql community software and graphical representation of this data.

REFERENCES

- [1] Thinagaran Perumal, Md Nasir Sulaiman, Leong.C.Y, “Internet of Things (IoT) Enabled Water Monitoring System” in 2015 IEEE 4th Global Conference on Consumer Electronics(GCCE), Catrino, Malaysia.
- [2] Z. Wang, Q. Wang, and X. Hao, “The design of the remote water quality monitoring system based on wsn,” in 2009 5th International Conference on Wireless Communications, Networking and Mobile Computing, 24-26 Sept. 2009, Beijing, China, 2009, pp. 1-4.
- [3] P.Jiang, H. Xia, Z. He, and Z. Wang, “Design of a water environment monitoring system based on wireless sensor networks,” *Sensors*, vol. 9, no. 8, pp. 6411–6434, 2009.
- [4] Y. Kong and P. Jiang, “Development of data video base station in water environment monitoring oriented wireless sensor networks,” In *Proceedings of the International Conference on Embedded Software and Systems Symposia*, 29-31 July 2008, Sichuan, China, 2008, pp. 281–286.
- [5] O. Postolache, P. Girao, J. Pereira, and H. Ramos, “Wireless water quality monitoring system based on field point technology and kohonen maps,” in *Canadian Conference on Electrical and Computer Engineering, IEEE CCECE 2003*, 4-7 May 2003, Montreal, Canada, vol. 3, 2003, pp. 1873–1876.