Implementing Internet of Things Driven Water Tank Controlling

Sujatha Karimisetty, Talari Surendra, B. G. Poornima Himaketan, A. Arjuna Rao, and Sudhanshu Maurya

Abstract This is to implement Internet of Things for controlling and observe water levels by using Water Tank Controlling System. At present IOT should be observed as a vision wherever "object", particularly everyday used things, like nearly home appliances used in everyone's home. However conjointly piece of furnishings, garments, automobile, transportation and sensible equipment, and much more, area unit decipherable, recognizable, physically identifiable, available and/or governable via the net. Water is consumed since ancient times as an emblem which is treated as divine and necessity. Since water is important in day by day life has most considerable position in human life, thus wastage of water ought to be avoided. By implementing IOT in the water tank controlling system, client easily monitors the streaming of water. Consumer can switch ON/OFF the motor by using the IOT driven application at anytime and from anywhere. This is employed with the assistance of sensors.

Keywords Internet of things · Sensors · Water tank controlling sytem (WTCS) · IOT driven application

1 Introduction

Internet has created vital impact in our financial system and culture by conveyance that lies outstanding message and networking physical infrastructure. The worldwide internet has been a chief constraint of worldwide processed data and media distribution. Local set of connections is constant to become lots of persistent, by

S. Karimisetty · B. G. Poornima Himaketan (✉)
Dadi Institute of Engineering & Technology, Visakhapatnam, India
e-mail: himaketanb@gmail.com

S. Karimisetty
e-mail: sujathakota29@gmail.com

T. Surendra
GITAM Deemed to be University, Visakhapatnam, India

A. Arjuna Rao
Miracle Educational Society Group of Institutions, Vizianagaram, India

S. Maurya
School of Computing, Graphic Era Hill University, Dehradun, India

S. Maurya et al. (eds.), *Cyber Technologies and Emerging Sciences*, Lecture Notes in Networks and Systems 467, https://doi.org/10.1007/978-981-19-2538-2_48

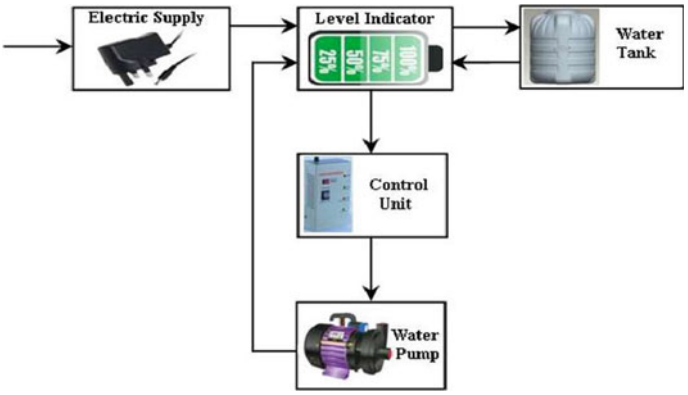

Fig. 1 Architecture of existing water tank controlling system

linking to novel embedded devices and devices which are handheld. In the existing system, the monitoring of water level is done manually. Whenever the tap is dried or empty, the consumer recognizes that the water tank is empty and it needs to be switched ON and when the tank is overfilled, the wastage of water occurs and then the consumer switches OFF the motor. Thus, everything is done manually.

The embedded system came into existence system that the consumer is provided with an LED display near the motor which depicts the position of the water tank using sensors. Whenever tank shall be empty the consumer shall get notification in the LED display and goes near motor and switch ON the motor and again gets notified when it is filled then switch OFF the motor. In some embedded systems it automatically switches ON/OFF whenever the tank is empty/filled but this cannot work every time if the consumer wants to get the tank empty inorder to clean the tank or for any additional purpose the consumer faces trouble. Many times farmers lost their lives due to snake bites when they went to switch on the motor. Figure 1 depicts the architecture of Water Tank Controlling System.

2 IOT Driven Water Tank Controlling System

2.1 IOT Driven WTCS

At present (IOT) should be observed as a vision wherever "things", particularly on a daily basis objects, like almost all home appliances however conjointly piece of furnishings, garments, automobile, roads and sensible materials, and more, area unit decipherable, recognizable, traceable, available and governable via the net. This may offer the idea for several new applications, like energy observance, transport safety systems or building security. This vision can sure as shooting modification with time, particularly as synergies between Identification Technologies, Wireless

device Networks, Intelligent Devices and engineering science can modify variety of advanced applications [1, 2].

Since water plays a most significant role in human life, thus wastage of water ought to be avoided. To implement web of things (IOT) in saving the water. Usually, human's store water in water tanks, they collect the underwater and store them in tanks. However most of the time tanks gets overfilled and there would be vast quantity of wastage in water. This happens in society, industrials areas even people that collect water in water vehicles [3].

So by implementing IOT for maintenance of such things, whenever it effects over these storage containers like implementing devices inbuilt with IOT. Wherever the consumer is there, the consumer can access and supervise level of water by the handheld devices like Mobile phones, tabs etc. This application comforts the consumer by means of application and also shows the position of tank over time through internet. Consumer can operate the ON/OFF from the mobile application at anytime and from anywhere. This is designed with the help of sensors. The control unit and mobile application are updated only through internet. Operation of the application of the control unit gets updated and makes the motor work with respect to the consumer's command. The application also provides an option 'automatic' which make the system work automatically in which the motor will automatically ON/OFF whenever the water tank is empty/filled to decrease manual work for storing water [1].

Proposed Algorithm: IOT driven WTCS.

Step 1: Initially the water tank is empty the ultrasonic sensor alerts client by sending notification to mobile application through internet.

Step 2: The consumer can switch ON the water tank motor through the link in WTCS application depending up on the requirement.

Step 3: If the consumer wants to impede the water in the middle which is filling the tank, where consumer may directly OFF the switch through the application.

Step 4: Whenever the water get through to the top edge of tank, the sensor makes the motor switch OFF through the internet [4].

Step 5: Once the tank is filled the consumer need not OFF the switch again. The consumer will accept notification as Tank filled' and motor is switched automatically OFF.

Step 6: The application also provides an option 'AUTOMATIC' that formulates the system work automatically basing on consumer's comfort.

Figure 2 depicts the design of IOT driven WTCS.

In the above figure, whenever the water tank is about to get overfilled, consumer will receive an acknowledgement. After receiving acknowledgement, consumer can switch off the motor by using mobile. The consumer can examine the position of the water tank by using mobile at anytime and anywhere [6, 7].

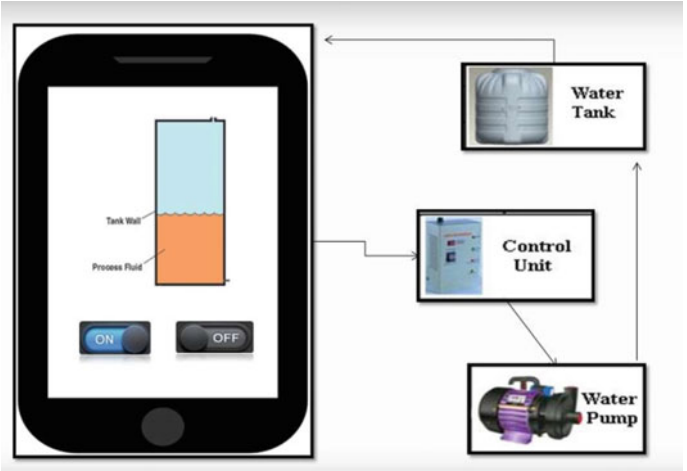

Fig. 2 Architecture of IOT driven

3 Result

The following graphs depicts the power consumed for 30 days generated by Manual system, embedded system and IOT driven WTCS (Fig. 3).

Table 1 illustrate the comparison between Manual system & embedded system with IOT driven WTCS.

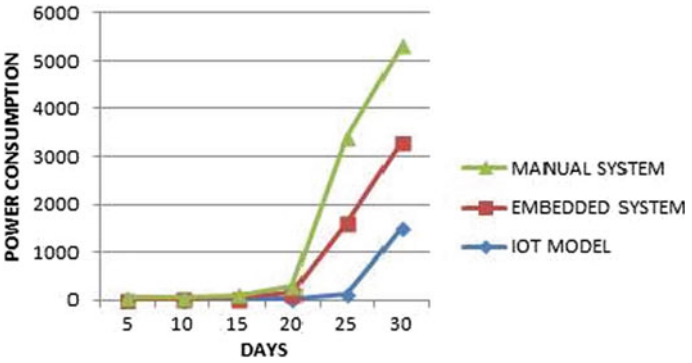

Fig. 3 Power consumption in manual, embedded and IOT model

Table 1 Manual WTCS and embedded WTCS with IOT driven WTCS table

Feature	Manual system	Embedded system	IOT model
Man power	High	High	Less
Electricity consumption	High	High	Less
Maintenance	High	Low	No Maintenance
Monitoring	Unavailable	Monitoring system with LED display	Anytime available monitoring on Desktop and mobile
Advantage	Used for years as this is easy process	Saves water	Anytime available monitoring on desktop and mobile
Disadvantage	Wastage of water and electricity	Wastage of electricity and physical presence is required near the system	Cannot run without internet

4 Conclusion & Future Scope

Thus by developing and implementing IOT based Water Tank Management System, the prevailing system will be ameliorated. Wastage of water and manual work would be reduced. The power necessities are quite low. The future scope is that it can be implemented for consuming electricity thereby sending acknowledgements to the consumer and the consumer can use same controls from the application.

References

1. Nuno B, Paulo R, Filomena S, Carlos M, Vitor C, Rosa V (2009) A remote system for water tank level monitoring and control - a collaborative case-study. In: 3rd IEEE international conference on e-learning in industrial electronics, ICELIE '09
2. Panindra B, Eswaran P (2013) Metro overhead tanks monitoring system using zigbee based WSN. In: 2013 IEEE conference on information & communication technologies (ICT)
3. Yogita P, Ramandeep S (2014) Smart water tank management system for residential colonies using Atmega128AMicrocontroller. Int J Sci Eng Res 5(6):355. ISSN 2229-5518
4. Vinay Sagar KN, Kusuma SM Home automation using internet of things. Int Res J Eng Technol (IRJET)
5. Abhishek V, Verma S, Shahani T (2012) Embedded web server for home appliances" international journal of engineering research and applications (IJERA). In: National conference on emerging trends in engineering & technology (VNCET-30 Mar'12). ISSN: 2248-9622
6. Bhide VH A survey on the smart homes using internet of things (IoT). Int J Adv Res Comput Sci Manage Stud
7. Raghavendra RM, Uttara Kumari S, Hari Prasad A Implementation of simulated water level controller. Int J Adv Res Comput Sci Softw Eng