International Journal of Innovative Research in Computer Science & Technology (IJIRCST)
ISSN: 2347-5552, Volume-9, Issue-3, May 2021
https://doi.org/10.55524/ijircst.2021.9.3.22
Article ID 219322, Pages 112-114
www.ijircst.org

# A Review Study on Smart Water Bottle

**Bhojraj Agarwal**

Assistant Professor, Department of Electrical Engineering, Vivekananda Global University, Jaipur, India

Correspondence should be addressed to Bhojraj Agarwal; bhojrajagarwal@vgu.ac.in



**ABSTRACT-** In today's ubiquitous IT environment, even non-living objects interact with one another and intelligently respond to changing circumstances. The Internet of Things (IoT) is a new technology that recognises and conceptualises the essence of computers. The article provides a short overview of IoT-enabled water bottles. Water is an essential component of human existence. The quality of water is influenced by a number of factors. The smart water bottle with touch and photoplethysmographic sensors can accurately detect the quantity of liquid in the bottle, monitor activity with inertial sensors, and physiological characteristics with a touch and photoplethysmographic sensor.The smart bottle uses input sensors to continuously monitor these parameters in real time; the system then analyses the data and, if necessary, uses actuators to execute the appropriate actions. In today's world, this method will be beneficial to health-conscious people. This method may also be very useful in the healthcare industry, where additional caution is required in all areas.

**KEYWORDS-** Health Care, IoT, Sensors, Waterbottle.

## I. INTRODUCTION

Internet of Things is such a tiny term, yet it is capable of accomplishing things that were once thought to be miracles a few decades ago.Any object from any range, such as a television, refrigerator, watch, shoes, clothes, and so on, has smart versions accessible in our fast-changing world. All of these things, which were previously exclusively utilised for one function, are now being used wisely to accomplish a range of advantages. IoT is the key to making these inanimate objects intelligent. The fundamental idea of the Internet of Things is to extract data from input sensors. Processing and collecting information from raw data, evaluating data, and making choices based on a set of algorithms or protocol rules Actuators of different types are used to carry out actions based on these choices[1], [2].

At the moment, a water bottle is simply that: a water bottle. Humans examine the water with their naked eyes and evaluate its quality based on how clear it seems. In this case, a person may make a serious error by drinking poisonous water that is not apparent to the naked eye. Not only are poisonous substances harmful to humans, but we also don't know how much water we need in our daily lives. Water amount varies based on a variety of variables such as humidity, stress, daily physical activity, work environment, and so on[3].

Neglecting the significance of a healthy and balanced diet may result in severe health problems that can shorten a person's life. Using Internet of Things as a technology, this bottle will assist in the required checks and will also keep track of the amount of water used, reducing the risk of health problems. The purpose of this article is to provide a short overview of smart water bottles. A variety of water sensors are utilised to collect data from the water within the water bottle, which may then be presented on a screen, allowing the user to determine whether or not the water is safe to drink[2] [3].

There is a scarcity of literature about such a breakthrough and useful technology. According to Mohammad Abdur Razzaque, there has been a tremendous advancement in the area of sensors and actuators in the past few years. IoT may be regarded of as a thing-oriented technology that uses sensors and actuators in certain instances. It not only uses a single device, but it also brings together a variety of devices under one roof in order to gather precise data and execute actions using actuators.The effectiveness of the model is directly proportional to the accuracy with which the gathered data is processed. Any data coming in from different input sensors must be matched and compared with the threshold values of the supplied parameters, analysed intelligently, and choices made based on the circumstances [1].

In their thesis 'An IOT Aware Architecture for Smart Healthcare Systems,' Luca Catarinucci et al [3] stated that a variety of sensors are attached to the body of the patient to help doctors achieve different parameters such as Blood Pressure, temperature, ECG, motion, and so on, in order to improve the effectiveness of the health care system. These are transmitted to a device through a wireless protocol (RFID). This kind of technology then uses those characteristics to continuously monitor patient health, assisting physicians in better handling emergency circumstances [3].

Different sensors continuously monitor numerous factors such as structural stress of buildings, noise, pollution, parking, humidity, temperature, and so on, according to the authors of the proposed system detailed in 'Internet of Things in Smart Cities.' Their suggested architecture has been adopted in the Italian city of Padova. For the examination of water and establishing its suitability for use, a large number of distinct parameters are needed, each with a particular threshold range. The controller

should keep a close eye on these parameters that are stated in the condition. Any change in the data must be presented to the user promptly so that appropriate actions may be taken.[4][5], [6]

The acronym IOT stands for "internet of things," with "Internet" referring to the physical link that enables the user to send data regarding parameter changes. To provide data from the sensors to the controller, the ZIGBEE protocol may be utilised. After that, the data may be presented anywhere the controller deems appropriate. It is also possible to send this to someone else through the internet. IEEE 802.15.4 has established the ZigBee protocol for creating a small area network, which requires very little power and bandwidth. This protocol is basically a simplified and cheaper version of Bluetooth[1][7].

There is a scarcity of literature about such a breakthrough and useful technology. According to Mohammad Abdur Razzaque, there has been a tremendous advancement in the area of sensors and actuators in the past few years. IoT may be regarded of as a thing-oriented technology that uses sensors and actuators in certain instances. It not only uses a single device, but it also brings together a variety of devices under one roof in order to gather precise data and execute actions using actuators. The effectiveness of the model is directly proportional to the accuracy with which the gathered data is processed. Any data coming in from different input sensors must be matched and compared with the threshold values of the supplied parameters, analysed intelligently, and choices made based on the circumstances[8].

In their thesis 'An IOT Aware Architecture for Smart Healthcare Systems,' Luca Catarinucci et al stated that a variety of sensors are attached to the body of the patient to help doctors achieve different parameters such as Blood Pressure, temperature, ECG, motion, and so on, in order to improve the effectiveness of the health care system. These are transmitted to a device through a wireless protocol (RFID). This kind of technology then uses those characteristics to continuously monitor patient health, assisting physicians in better handling emergency circumstances[9].

Different sensors continuously monitor numerous factors such as structural stress of buildings, noise, pollution, parking, humidity, temperature, and so on, according to the authors of the proposed system detailed in 'Internet of Things in Smart Cities.' Their suggested architecture has been adopted in the Italian city of Padova. For the examination of water and establishing its suitability for use, a large number of distinct parameters are needed, each with a particular threshold range. The controller should keep a close eye on these parameters that are stated in the condition. Any change in the data must be presented to the user promptly so that appropriate actions may be taken [10].

The controller will receive the values of parameters collected by the sensors. The controller then utilises these values in its conditions and continuously monitors for any changes in its values in real time. If a value changes at any point in time, the new value is compared to its mapped value. If the value exceeds the threshold, a notice is sent out right away. The warning will appear on the bottle's digital touch screen, the colour of the LED on the bottle neck will change, and the user may also be informed through his smartphone.

## II. DISCUSSION

A water bottle is transformed from a basic water container to a proactive and intelligent water bottle. With IoT in view, the article presents a model that comprises of numerous sensors, standards, and protocols, as well as a user interface that collects various input parameters. This input data has been processed, and information has been produced. This data is then compared to the threshold values, and the result of the comparison may be presented to the user based on the outcome. This would be very beneficial to the user who is unable to see the precise issue with his naked eyes by just looking at the water, let alone in an intelligible manner. The user may then take the necessary steps to live a healthy life with the assistance of the knowledge. Critical hazards may also be avoided and dealt with in a logical and effective manner with the assistance of this smart bottle. Smart water bottles have become ingrained in the lives of many people, and their popularity is fueling profitable growth. Keeping consumers healthy is at priority, Joint health, body temperature regulation, good quality water helps in better functioning of Organs. The smart water bottle helps in preventing the user from infection. The smart water bottle keeps the body of the user hydrated.

## III. CONCLUSION

Using the Internet of Things as a technology, this bottle will help with the necessary inspection while also keeping track of the quantity of water used to reduce the risk of health issues. Instead of just notifying the user, the smart bottle can also give solutions and instruct the user on what needs to be done to make water healthier and safe to drink. Future enhancements for this proposed system could include designing architecture for not only monitoring but also purifying the water if some bad agents are found in the water.

## REFERENCES


[1] E. Jovanov, V. R. Nallathimmareddygari, and J. E. Pryor, “SmartStuff: A case study of a smart water bottle,” 2016, doi: 10.1109/EMBC.2016.7592170.

[2] N. E. Lee, T. H. Lee, D. H. Seo, and S. Y. Kim, “A smart water bottle for new seniors: Internet of Things (IoT) and health care services,” Int. J. Bio-Science Bio-Technology, 2015, doi: 10.14257/ijbsbt.2015.7.4.30.

[3] T. Stout* et al., “MP12-05 UTILIZATION OF A SMART WATER BOTTLE TO INCREASE FLUID INTAKE IN STONE FORMERS,” J. Urol., 2019, doi: 10.1097/01.ju.0000555198.85152.f6.

[4] M. S. Borofsky, C. A. Dauw, N. York, C. Terry, and J. E. Lingeman, “Accuracy of daily fluid intake measurements using a ‘smart’ water bottle,” Urolithiasis, 2018, doi: 10.1007/s00240-017-1006-x.

[5] M. Rafiqul Islam, “A Study on the TDS Level of Drinking Mineral Water in Bangladesh,” Am. J. Appl. Chem., 2016, doi: 10.11648/j.ajac.20160405.11.

[6] N. B. Khan and A. N. Chohan, “Accuracy of bottled drinking water label content,” Environ. Monit. Assess., 2010, doi: 10.1007/s10661-009-0993-7.

[7] K. S. Parimala, S. Yerraboina, N. A. Jyothi, and A. Dash, "Monitoring the water storage facilities using internet of things," Int. J. Civ. Eng. Technol., 2018.
[8] H. Kalantarian, B. Motamed, N. Alshurafa, and M. Sarrafzadeh, "A wearable sensor system for medication adherence prediction," Artif. Intell. Med., vol. 69, pp. 43–52, 2016, doi: 10.1016/j.artmed.2016.03.004.
[9] L. Catarinucci et al., "An IoT-Aware Architecture for Smart Healthcare Systems," IEEE Internet Things J., 2015, doi: 10.1109/JIOT.2015.2417684.
[10] A. Zanella, N. Bui, A. Castellani, L. Vangelista, and M. Zorzi, "Internet of things for smart cities," IEEE Internet Things J., 2014, doi: 10.1109/JIOT.2014.2306328.