



Smart Water Container

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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 technology that recognizes and conceptualizes the essence of computer.

Fluid intake is important to prevent dehydration and reduce recurrent kidney stones. There has been a trend in recent years to develop tools to monitor fluid intake using "smart" productions such as smart bottles. The article provides a short overview on IoT-enabled water bottles. The quality of water is influenced by a number of factors. The smart water bottle uses input sensors to continuously evaluate temperature, water level, pH level in real time. This method is beneficial to health-conscious people and may also be very useful in the health care industry where additional caution is required in all areas.

Keywords: Health Care, IoT sensors, Water bottle

I. INTRODUCTION

Dehydration is a very serious health issue as it can lead to adverse complications. Fluid intake balance is important especially among the elderly and people with underlying conditions affecting fluid regulation. High fluid intake is recommended for patients at risk of recurring stone formation. Therefore monitoring fluid intake is a useful way to determine if adequate fluid has been consumed. There are many attempts made to create such system or devices that aid in tracking and managing fluid intake. Unfortunately most of the studies have not resulted in commercially available products. Any object from any range such as television, refrigerator, watch, shoes, clothes, and so on have smart versions accessible in our fast-changing world. All of these things, which were previously exclusively utilised for one function, are now being used widely to accomplish a range of advantages. IoT is the key to making these inanimate objects intelligent. Actuators of different types are used to carry out actions based on the design. 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 drink contagious water. Water amount varies based on variety of variables such as humidity, stress, daily physical activities, work activities and so on.

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

IoT may be regarded 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.

II. LITERATURE SURVEY

Lambrou et al. (2023) discussed the development and implementation of a portable, mobile, cost-efficient and reliable water level control system. Here the authors used two transceivers of radio frequency (RF) and a transmitter mounted on the tank and sump at the place where they wanted to check the quality of water. The RF transceivers used for wireless communication to the internet server. With the help of a microcontroller, the system is fully programmed of the user unless the water the bottle is drained or overflowed. The sensor array is used to measure various parameters such as dissolved Oxygen, Tumble, pH, Temperature, etc. Sensor array. Costs of installation are reduced because of the wireless system.

OmarFaruqet al. (2022) A water quality monitoring system based on microcontrollers for people living in Bangladesh's outskirts, where safe drinking water is not available, is provided in this paper. The device has been designed with a high degree of accuracy and is sensitive to several water parameters such as temperature, turbidity and hydrogen potential. (pH) displayed on the LCD monitor. Finally, in this paper, each of the parameter values is compared with the predefined equipment, and sensor values and error are calculated. Hydration Reminding Smart Bottle: IoT Experimentation Dr.P.B. Pankajavalli,Mr.R. Saikumar,Mr.R. Maheswaran have proposed the idea of a smart water bottle which

- **ESP-32**

Components used:

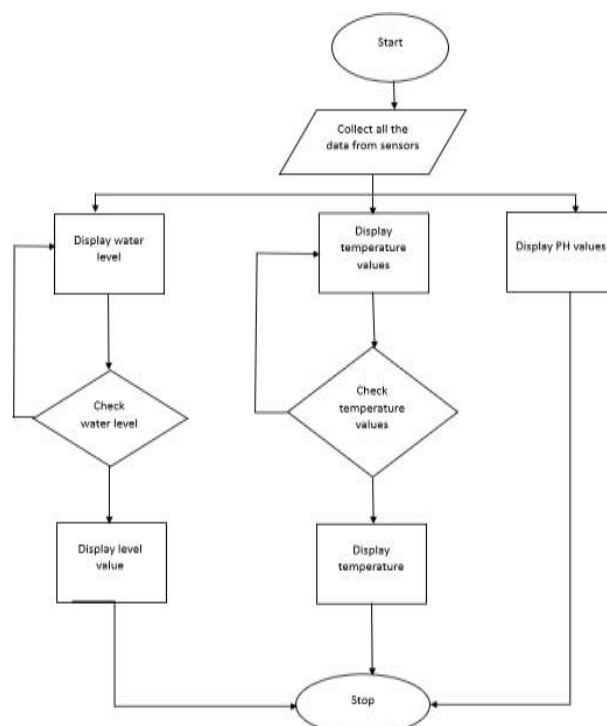
reminds humans to input water after certain interval of time so that the person does not feel dehydrated. The Water Float Sensor present in the bottle detects the position of water as low or high. RS232 chip decides the type of communication to be transferred and also instructs the GSM Modem that provides voice and data related services to communicate with the electronic device., mobile phone after which the person receives communication in the form of SMS on the mobile screen reminding him her to drink water and stay dehydrated, so the power consumed for this proposed model was 5v.

J Laxmi Lahari proposed the idea of water bottle which can help us in keeping track of the quantum of water we drink. It also reminds to refill the water bottle and assists the consumer to ameliorate his water drinking habits. An ultrasonic detector is installed inside the cap of the bottle which is leakproof in nature. It'll help in determining the water position inside the bottle for which the labors will be shown in Adafruit IO feeds. Its data changes with change in the position of water. The buzzer rings whenever the water position is zero inside the bottle and stops once the bottle is refilled. It also rings to remind the consumer to drink water if he hasn't drunk for further than 2 hours.

III. METHODOLOGY

- A power supply of 4V is applied to the ESP32 microcontroller, temperature sensor and ultrasonic sensor, it allows these devices to function and perform their respective tasks.
- To measure the temperature, we have used DS18B20 sensor.
- Water content is measured though ultrasonic sensor, distance is calculated from the time delay.
- pH measurement is included to assess if the water is suitable for drinking or not.
- All these data are displayed on the LCD

IV. FLOWCHART



Power supply

- LCD
- Ultrasonic sensor
- pH sensor
- Temperature sensor

V. RESULTS

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 would be very useful to the user who is unable to see the precise issue with his naked eyes by just looking at the water. The user may then take the necessary steps to live a healthy life with the assistance of knowledge. Critical hazards may also be avoided and dealt with in a logical and effective manner with assistance of this smart water bottle. The smart water bottle helps in preventing the user from infection. The smart water bottle keeps the body of the user hydrated.

VI. CONCLUSION

The conclusion of the document highlights the 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.

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