Faculty of Information Technology

BLUEAQUA

Group No: 24

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Introduction

Approximately 97% of the water on our planet is salty, with less than 3% being freshwater. The majority of the world's freshwater is frozen in glaciers and ice caps, or it is deep below in aquifers. Less than 1% of the water on Earth is freshwater that we can easily access to satisfy our requirements and only

source of all drinking water. However, is this water safe to drink? Or perhaps go swimming in? With advancements in technology and science, the variety of contaminants discovered in these fresh water sources is astounding. The contaminated water is unsuitable for human consumption. Water pollution is mostly caused by human waste, animal excrement, chemical waste, pesticides, and industrial waste.

The polluting of streams, rivers, lakes, and groundwater is known as freshwater pollution. Water pollution not only harms the ecosystem and aquatic life, but it also harms human health. In most developing nations, around 70% of untreated industrial waste is disposed into fresh water bodies. A huge water crisis is being created in the world due to the irresponsible activities of the people.

As a result, there is a global water crisis, from Cape Town to Flint, Michigan, and from rural Sub-Saharan Africa to Asia's teeming megacities. 785 million people worldwide do not have access to safe drinking water and they are struggling to access the clean water which they need for cooking, bathing, hand-washing, and growing their food.

There are 2.3 billion individuals who do not have access to basic sanitation. Every day, over 800 children die from diarrhea and 829 000 people are estimated to die each year by consuming contaminated water, sanitation, and hygiene, as well as scarce worldwide. More than one in every ten people on the earth lacks access to safe drinking water. Every day, women and girls spend an estimated 200 million hours transporting water.

In rural Africa, the typical woman treks six kilometers each day to transport 18kg of water. As a result of this, Water scarcity comes to the fore among humans' beings. It has an impact on families and communities. They may be trapped in poverty for generations if clean, easily accessible water is not available. Children drop out of school, whereas parents are struggling to survive.

Women and children are disproportionately affected, with children being more sensitive to infections caused by contaminated water, and women and girls typically bearing the responsibility of transporting water for their families for an estimated 200 million hours every day. Water-related disasters occur approximately 90% of all-natural disasters

Problem in Brief

We can clearly say that the main ways how water is being polluted nowadays is through the industrial waste and garbage that are being dumped in to canals and rivers and also the various types of fertilizers and pesticides used for cultivation where some of it will get washed away to the nearby rivers and the rest of the artificial substances get in to the daily meals of people. This does not only bring harm and suffering for humans but also to the nature and the other living creatures and animals.

As a result, some 1.1 billion people worldwide lack access to water, and a total of 2.7 billion find water scarce for at least one month of the year. Inadequate sanitation is also a problem for 2.4 billion people—they are exposed to diseases, such as cholera and typhoid fever, and other water-borne illnesses. Two million people, mostly children, die each year from diarrheal diseases alone.

For the majority of people suffering from water scarcity, the problem is that even if water is available, it is not in a suitable condition for drinking due to the mixing of various pollutants.

Due to this, people are motivated to use water even without checking its quality. As a result, many health problems rise up among the people. Therefore, at least an opportunity to consume clean water should be given to everyone.

A method of testing drinking water easily and with more accuracy as well as repurifying polluted water should be introduced.

Thus, it is possible to identify the water that is unsuitable for drinking and to avoid the use of that water which many lives can be made safe. Also, majority of the problems which occurs due to lack of water can be alleviated.

Aim & Objectives

We are the team BLUEAQUA doing a project to test water quality & purify the contaminated water.

Water quality refers to the chemical, physical and biological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used by reference to a set of standards used to assess water quality related to the health of ecosystems, the safety of human contact, and drinking water.

The reason why we have chosen this is since the water Information that we have found in most of the rural areas all over the world is not purified sufficiently. There is no technique for those people to analyze the condition of the water in those communities. And this misinformation has caused many innocent peasants in these rural areas to become ill. The danger, in this case, is that people consume water without recognizing that the water they are drinking is contaminated with toxic microorganisms.

We will develop a unit to test these bases and inform the public before using water by providing a detailed report on the water

Objectives

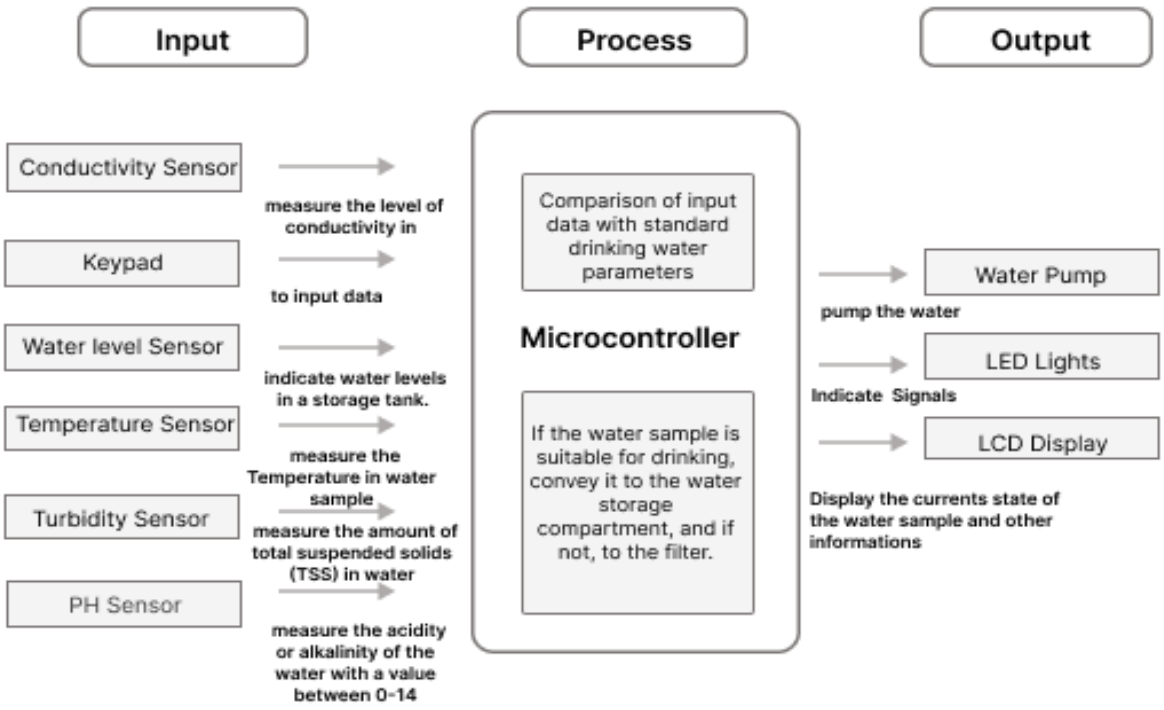
- To identify which algorithm is the best to predict water quality to the user
- Find out similar approaches and evaluate in Water quality Prediction
- Find out technologies that can be implement in IOT
- Select most suitable development tool and technologies
- Study about current exiting water filtering systems

Proposed Solution

The below diagram illustrates how our model is going to work.

So, to start, the user has to immerse the sensors into the water that has to be tested. Then the system shows the current conditions of the water sample to the user through the display and how far it is suitable for drinking. If the water sample cannot be filtered by the system filter, it will also be shown to the user through the display.

If the water sample is acceptable for consumption, it is kept in a water bank, otherwise, it is deployed to the filter. The water sample that comes through the filter process is again tested through sensors, where, if the water sample needs to be filtered further, it is transported back to the water filter, and if it is suitable for drinking, it is transported to the Water bank.



Inscope

The water from rural areas are considered – River, streams, Wells and lakes
ex: - pH, Conductivity, Turbidity, dissolved oxygen
The release and diffusion of toxic substances in the environment can have effects on water quality in rural areas are considered

The ability to purify water samples within the range of recommended parameters

The ability to Store purified water for later use

Rural areas around the world are considered – Not only Sri Lanka, this project considered other areas of counties in the world are considered to use this project.

Limitations

- Some other parameters that are considered for the quality of clean water cannot be tested through the sensors used here.

  Ex- Taste and odor

  Electrical conductivity (EC)

  Acidity

  Chloride / Nitrogen / Sulfate / Chlorine residual / Fluoride .....

  Biochemical oxygen demand (BOD)

  Since certain parameters are not tested in BLUEAQUA, a quality report about those parameters cannot be given here.

- Blueaqua's water filter has selected water purifying limitations.

  Ex- Very high and very low temperatures cannot be controlled

  Very high and very low PH Levels cannot be controlled .....

Resource Requirement

- PH Sensor – to measure the PH value in the water
- Conductivity Sensor – to measure Conductivity in the water
- Water level Sensor – to measure the water level in terms of distance
- Turbidity Sensor – to measure the amount of light that is scattered by the suspended solids in water.
- Water Temperature Sensor – to measure the Temperature value in the water
- Submersible Water Pump – to pump the water sample
- LCD Display – to Show details
- Keypad – to input data

Sensor	**Price**	**Quantity**	**Total**
PH Sensor	**5650**	**1**	**5650**
TDS Conductivity Sensor	**4250**	**1**	**4250**
Water level Sensor	**525**	**2**	**1050**
Turbidity Sensor	**3650**	**1**	**3650**
Temperature Sensor	**500**	**1**	**500**
Water Pump	**650**	**2**	**1300**
LCD Display	**1650**	**2**	**3300**
Keypad	**650**	**2**	**1300**
Total Price			**21,000**

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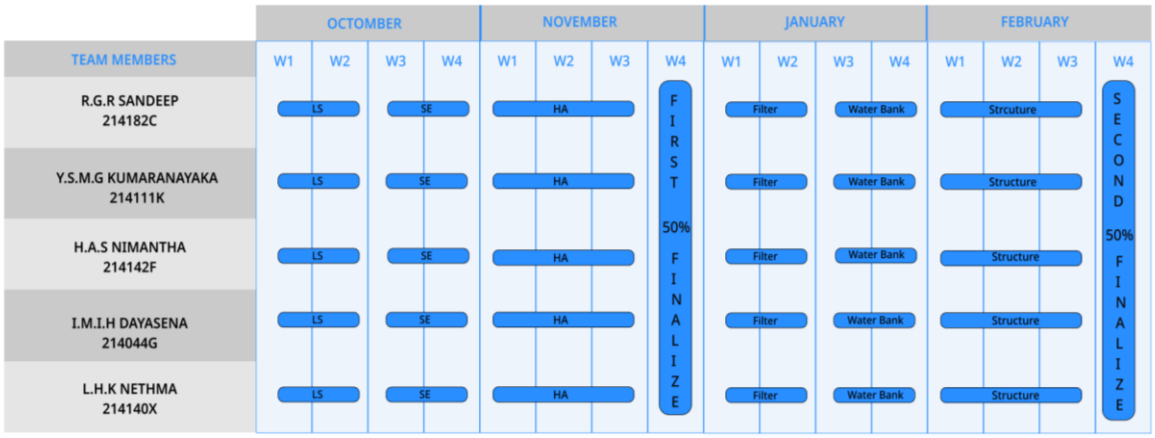
Appendix

Action Plan



LS - Literature Survey

SE - Learn about sensors and Microcontroller

HA - Hardware Activities

Filter – Water Filter development

Water Bank – Water Bank development

Structure – Structure development

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214140X	L.H.K Nethma	TDS Conductivity Sensor