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PORTABLE ECO ANALYZER

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ABSTRACT

Our project portable Eco-Analyzer will be helpful in taking decision individually or in community to get good environment quality. The issue of clean and healthy environment is very paramount in any organization or society, especially organization as a hospital. Therefore, we intend to resolve this problem by bringing in a data driven electronic system that can tell the quality of the overall environment. This data driven electronic system is not just any simple machine giving single output related to quality of environment, but it will also show the real time data of very important environmental parameters such as temperature, humidity, air quality index etc. This system comes with inbuilt lcd and memory card module so that one can watch the real time data on the screen and can save all the data which are collected by the sensors so that further analysis can be done.

Keywords: Environment, Health, Data, System, Electronic.

I. INTRODUCTION

The first step for analyzing the ecosystem is gathering weather data. This step provides you as the analyzer with a three-dimensional picture of what is going on within the atmosphere and a sense of why the atmosphere is doing what it is doing. Before exploring the various aspects of operational weather analysis, we need to ask the question: What is weather analysis?

Definition of Weather Analysis: "Analysis" can be defined as detailed examination of something, it is a process of breaking entire part into small small parts so that each part can be examined in detail. Above process detects the characteristics of weather. Day-to-Day weather occurs mainly in Troposphere so does analysis of troposphere plays an important role in whole analysis. The parameters that we are going to examine are temperature, humidity, heat index, altitude, atmospheric pressure, etc. The analysis over time will help to draw a better picture of how things are changing.

Nowadays human beings are extremely cautious about their health as industrialization and urbanization is gradually increasing affecting mother nature, so to ensure that one has access to healthy surrounding, we aim to build “PORTABLE ECO-ANALYSER". This project will be helpful to take the decision individually or in a community to detect and measure good environment quality.

II. METHODOLOGY

After doing detailed literature survey and cost analysis of the system. We figured out five important parameters of an environment such as temperature, humidity, air quality index etc. which can be collected using few sensors which were easily available in the market and was also effective in calculating the quality of the environment. The overall system was divided into three phases building an embedded system, collection of data, calculation of environmental score. In the embedded system we have integrated all the sensors along with the Arduino lcd display, real time clock (RTC module) and memory card module in the printed circuit board. All the data which were collected by the sensors are stored in the memory card in CSV file format and the live data was displayed on lcd display. For the final phase we have developed a mathematical formula to calculate the environmental score which ranges from 0 to 1.

III. MODELING AND ANALYSIS

Clean air and a healthy environment are the need of our society. Unfortunately, as of now in India it seems having access to healthy environment is luxury and very few people have it, but there is something which is even more unfortunate that people are not aware of the fact if they are inhaling polluted air or if they are living in very low AQI region which has very dangerous impact on health. To solve this issue our system comes into the picture, Eco Portable Analyser judges the environment based on various parameters such as Air quality index, temperature, humidity etc and then gives a score between 0 to 1. Score closer to 1 indicates a good and healthy environment.

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In the health care sector having a healthy environment is essential, our product can be used in the healthcare sector to maintain a healthy environment as the system not only displays the current environmental parameters but also it can predict future parameters, so accordingly the management can take effective decisions in advance.

It also has a huge scope in real estate space, as nowadays people are more concerned about the health factors, so while buying or renting a house people can check the overall environmental score using our device and then they can decide whether to buy it or not.

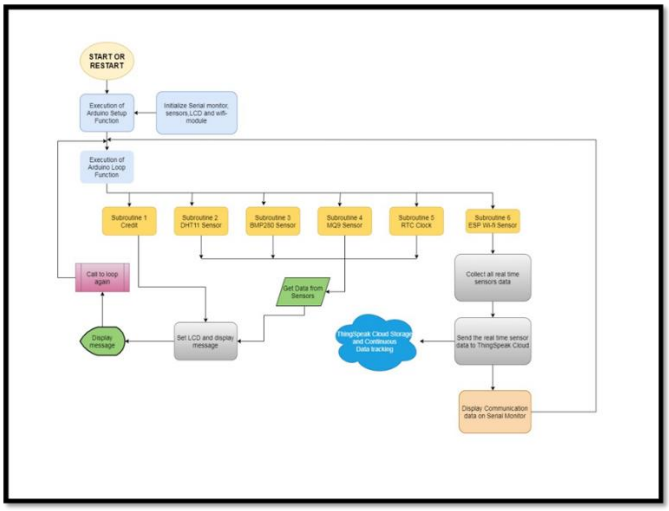

Figure 1: Flowchart of the System

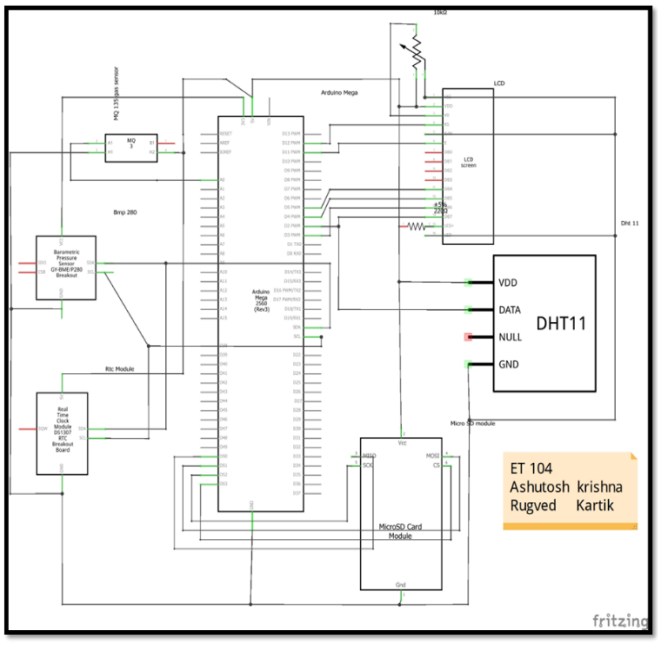

Figure 2: Circuit Diagram

IV. RESULTS AND DISCUSSION

We have successfully created the portable ecosystem analyzer using different sensors like Dht11, Bmp 280, MQ 135, Liquid Crystal Display and Arduino Mega 2560. We stored each reading of each sensor into memory card for further analysis. Then we formulated one formula to calculate the score which will define the quality of surroundings.

Then we calculated a score for every geographical point on which we took the readings, so that we can have one parameter to classify the quality of surrounding on the scale of 1 to 10. The results on serial monitor and the result with calculated score on CSV file are shown below:

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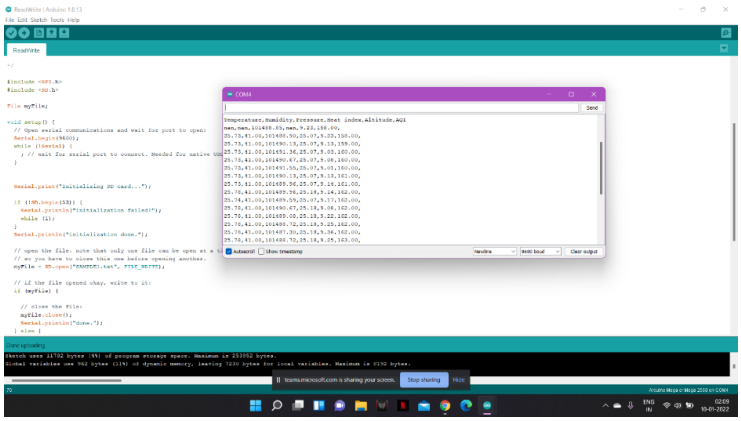

Figure 3: Output on serial monitor

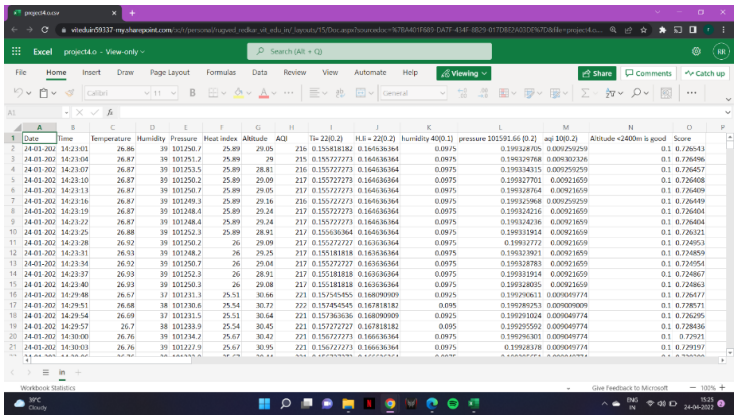

Figure 4: Output on CSV file with Calculated Scores

V. CONCLUSION

The main objective of the project is to predict the quality of weather so that one can have access to good surrounding which will benefit in maintaining the good health. So, we are aiming to the people to take the decision individually or in a community to detect and measure quality of environment. Environment and healthy surrounding affect every facet of society-economies, environments and cultures. As a result, planners, policy makers, decision makers, government officials and other stakeholders are increasingly seeking knowledge on the nature of such extreme events on time scales from hours to days, to seasons and to decades.

This important Issue has shown the nature of the resulting scientific and similar challenges, the progress made to date, and the opportunities and difficulties yet to be addressed. Collectively and individually, the authors of this important Issue hope that they have contributed to increased understanding of where, how and why such issues manifest themselves, now and into the future. These insights increase the capacity to manage the risks associated with these issues, and thereby reduce the consequences that people might otherwise have suffered.

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