Survey on IOT Based Application for monitoring and Predicting Air Quality in the environment

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ABSTRACT

India has struggled with pollution for a long time. In fact, in February, India was home to six out of 10 of the world's most polluted cities. In contrast to atmospheric pollution, surrounding pollutants are about 1000 times more likely to be transmitted to the lungs, causing diseases. The main sources of air pollution are motor vehicle emissions, illegal industrial activities, harmful pesticides, and many times we see LPG gas leakages and cylinder truck accidents on road which are harmful for us and can take our lives. Thus, poor air quality causes several health hazards like heart disease, lung cancer, and respiratory problems. The need of the hour is not only to control air pollution but also materializing technologies, devices and software systems to keep a close check on air pollution. Our efforts in this project is to develop an application from which air quality monitoring can be done to take preventative measures to make our living environment safe. The application is user-friendly and works as a preventative mechanism to generate real-time alerts on air quality. Our main contribution is to develop air quality monitoring system that senses the real-time data of surrounding parameters like carbon monoxide, and PM level and alerts the people when the quantity of these elements goes beyond a certain limit and shows the data in an easily understandable format.

Keywords: Air Quality , Raspberry pi, Internet Of Things, Sensors, Air Pollution.

I. INTRODUCTION

Air pollution is one of the environmental issues that cannot be ignored. With deteriorating air quality all over the globe due to industrial and vehicular pollution, there is an increasing risk of breathing problems and lung diseases arising from it. This system which is an android app, is used to sense the air quality of the environment and shows the real condition of air. The purpose of the project is to monitor air quality using different sensors like MQ- 135 is an air quality sensor, which is sensitive for benzene, smoke and other pollutant, MQ-4 is a methane and CNG sensor, MQ-7 is carbon monoxide sensor and MQ-6 is a LPG sensor. These are used in combination with the raspberry pi to calculate AQI and notify the user. Solving the drawbacks of existing air quality sensors this application can be used to monitor various gases at a time. The major motivation behind the study and the development of the system is to help the government to devise an indexing system to categories air pollution in India. The project

is to build an air pollution monitoring system application, it's a detection system for multiple information of environment is designed in this project.

II. LITERATURE REVIEW

Ajitesh Kumar, Mona Kumari and Harsh Gupta[1] proposed a cost-proficient air quality observing framework that detects the continuous information of encompassing different boundaries like smoke, carbon monoxide and PM level and cautions the individuals when the amount of these components goes past specific cutoff and shows the information in a without any problem reasonable configuration. Later on, additionally detecting hubs can be added to expand the framework. The significant preferred position of this framework is that it is versatile, little and cost-effective. We have also introduced the execution of an ease IoT based air quality checking framework.

Pratishtha Agnihotri, Sonam Tiwari and Dr. Devendra Mohan[2] proposed a novel scheme to conduct the fine- grained and real-time prediction of AQI based on asynchronous data collected by our monitoring system. They present the asynchronous sensing data and the spatial-temporal-meteorological relations. Based on the CG model, the prediction procedures are carefully designed and an optimization problem arises. They aim to solve the optimization problem by an algorithm combining a closed-form derivation and genetic algorithm. The advantage of the proposed solution over existing ones is evaluated over the data set collected by our monitoring system.

Ravi Kishore Kodali and Sairi pathuri Sasweth C. Rajnarayanan[3] proposed a surrounding air contamination detecting framework can give ongoing estimation of five generally significant for human well- being air boundaries and move it to more

significant level applications for examination and anticipating. Estimated information is reinforced along with timestamp and GPS position. The gadget spares information into on-board SD card with capacity to be moved to a have PC by direct USB association or through Wi-Fi transmission.

Zixuan Bai[4] have stated that because of the disturbing degrees of contamination in a portion of the significant urban communities of world, persistent observing of air quality has become a significant issue. By utilizing remote detecting system alongside rapid web association, the checking and examination process has become effective. Such mechanized frameworks are precise, history of the boundaries is moreover put away which can be utilized. The WSN checking frameworks can likewise be executed for different sorts of contamination, water contamination, soil contamination or radioactive pollution.

Mykhailo Lobur and Dmytro Korpyljov and Nazariy Jaworski[5] have presented a remote sensor organize for air contamination observing in light of IOT is useful for the business as well as everyday citizens too. As the contamination information will be accessible with individual and one can see where the contamination level is more around then and the individuals having respiratory sicknesses may abstain from following that way for that specific time of time. Advanced cells are extremely regular now daily. Indeed, even the contamination because of ventures can be checked and the information can be made accessible on the web so that, the important activity to diminish the contamination might be started furthermore.

Md. Mohiuddin Ahmed, Suraiya Banu and Bijan Paul[6] has stated that the alarming levels of pollution in some of the major cities of world, continuous

monitoring of air quality has become a major issue. By using wireless sensing network along with high speed internet connection, the monitoring and analysis process has become effective, efficient and is easily accessible by common people. Such automated systems are accurate, reliable. The WSN monitoring systems can be implemented for water pollution, soil pollution or radioactive contamination. Using high efficiency communication protocol along with sensor network to achieve accurate data in real time.

Octavian A. Postolache, J. M. Dias Pereira, and P. M. B. Silva Girão[7] elaborates the development of an IoT- based indoor air quality monitoring platform is presented. Experiments were performed to verify the air quality measurement device used in the platform based a method suggested by the Ministry of Environment, Korea. We verified the accuracy of indoor air quality monitoring and the desirable performance of the device. Also, experiments making use of the platform were conducted and demonstrated suitable performance and convenience of the air quality monitoring platform. In this paper, the author focused on testing the reliability of the device and implementing the platform.

Somansh Kumar and Ashish Jasuja[8] states that the proposed framework gives minimal effort, low force, conservative and exceptionally exact framework for checking the condition with the committed sensors remotely from any place in this world. An ideal trade off among exactness and cost is accomplished by utilizing single board minicomputer Raspberry pi and proper sensors prompting a well-grounded framework. Air quality observing framework can be more worthwhile if poisons like Sulfur dioxide, nitrogen dioxide, ground level ozone and so forth are additionally checked.

Ajay Chaturvedi and Laxmi Shrivastava[9] has stated the execution of an estimating framework for air quality checking. Two structures are ace postured for remote correspondence between the detecting hubs what's more, a PC that deals with the entire framework. The frameworks are especially appropriate for indoor applications. The yield of the pre-owned gas sensors depends not just on the cross impact of the essential estimated gas yet in addition on external impact factors, to be specific temperature and mugginess. The impact of this cross effect on the exactness of the estimation can be limited utilizing moreover neural systems.

JunHo Jo, ByungWan Jo, JungHoon Kim, SungJun Kim and WoonYong Han[10] states, with the correct usage of the proposed framework they can decrease risky mishaps that happens all through the nation. This arrangement can be introduced in house for house well-being just as any industry or crowed work environment to keep up the air quality safe and lift their work speed. One of the primary explanation of this is outrageous pneumatic force. So, in future they need to expand this framework to recognize pneumatic force of evaporator so it can forestall mishaps and spare numerous lives just as modern misfortune

III.CONCLUSION

Overall, the application is a need of this hour as we know pollution in the environment is increasing at very large huge rate. Due to increase in number of vehicles, the possibility of road accidents has also increased, in which gas trucks are included. By using this application, the users will not only get an alert message prior to explosive action but also, they will receive a proper guidance in reaching to the safe destination. Not only in serious situations, this application also notifies the user with their current

status and gives them tips on how to be more on the safer side.

In future, this application can be extended to the iphone users as currently its an android based application. Also, as per the increase to requirement it can also be extended as website.

IV. REFERENCES

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