

A Literature Review on Air Quality Monitoring System

Devki Nandgaye¹, Anisha Ganvir², Prajakta Thakre³, Pooja Gajbhiye⁴, Ashwini Dhok⁵, Tejas Kamble⁶

Associate Professor, Department of Information Technology, NIT, Nagpur

¹B.E Graduate(IV year), Department of Information Technology, NIT, Nagpur,

³B.E Graduate(IV year), Department of Information Technology, NIT, Nagpur.

⁴B.E Graduate(IV year), Department of Information Technology, NIT, Nagpur

⁵B.E Graduate(IV year), Department of Information Technology, NIT, Nagpur

⁶B.E Graduate(IV year), Department of Information Technology, NIT, Nagpur

Abstract –The Intravenous Bag Monitoring System is based upon the “Internet Of things” with the use of new Technology of Artificial Intelligence & it is useful for the Hardware as well as software and any type of project we can create using this technology & with the use of new technology today’s world are grown up to the never possible conditions are also possible through the AI system So, we are looking forward to our application is basically use for the hospital purpose including small Clinics & Big Hospitals we had studied on it for which type of problems faced by Nurses and doctors so as we looking for this problem then we are generating and finding solution on it that is “Intravenous Bag Monitoring System”. Basically this application works on the IV Bags weight sensor through this sensor the load cell sense the weight of the IV Bag and through the cloud computing that data going to the cloud and the Blynk IOT application fetch the data from the cloud and it will display the Blynk IOT dashboard like how much liquid are available in the IV Bag and the new feature added in this application is that when the liquid is coming up to the 15% then the Buzzer will get started on the particular Hardware Kit and as well as on the mobile also alert notification sending if any nurse was busy in her another work and she cant using her mobile that time Buzzer get started when the liquid is below 15% and as per the IV Bag we can set the percentage and the Buzzer will get started.

INTRODUCTION

I would like to feel immensely delighted to present the “Intravenous Bag Monitoring System “.In this project I have tried to give all the importance and appropriate things about the project.

In this project, I have endeavoured to make this project attractive and easy to understand. Each and every topic of the project is well explained in details which will enhance

the depth of the learning experience. The Intravenous Bag Monitoring System proposed on the basis of real time use for the hospital in detail I would like to explain and elaborate to understand overall module So, basically it is too much useful for the big hospital for sign in on a digital platform our project make sure that the nurse can doing at a time whole hospital works and it is profitable for the doctors. In brief this project is work on the basis of time management that a

particular nurse manage her time as well as handle her allotment patients. If in case any critical situation will happens means the liquid present in that bottle will below 15 % then buzzer get started and another nurse will change that IV bag. The Intravenous bag Monitoring System taking place of time management and notified to the doctors and alert to the doctors and also did not cause any patients death and emergency if the nurse will properly follow this rules and regulations then she is doing well for her opinion and the doctors also impress on her through this project patients also having properly IV Bags so, we can practically implemented this project in an any hospital via clinics.

IV solutions come in a variety of solutions, concentrations, and volumes. They are considered medication, and as such the 7 Rights apply. The prescribe will order the IV solution and rate. The nurse monitors for signs of complications related to the solution and IV equipment. IV bags and tubing should have a sticker or label with the date, time, and initials of the healthcare provider marked on them to be valid. The Intravenous Bag Monitoring system impulses to manage nurse time and doctors time with their schedule wise. If A particular patients needs blood bottle then that one also we will updated in the application i.e. Blynk IOT application in this application as per the new technologies launched then we will updated it as soon as possible and we would like to implement every module in our application as per the customer requirement’s we will developed and updated the application as early as possible this the IOT based platform gives overall opportunity to express our project skills and show some different from others so that’s why we are

pleasantly implemented this project. The project is made by it in the Arduino software with the use of embedded C++ code with the cloud computing through the program will fetch the data of load sensor and will display on the 16*2 LCD in the middle side of the stand and also display on the mobile as well as desktop and any web application and web server also can access it. For the hardware panel it needs to Wi-Fi connection for access the LCD

LITERATURE REVIEW

The Literature review is a comprehensive summary of previous research on IOT based Air Quality Monitor Application. Here, we have demonstrate the knowledge and understanding of the following IOT Application and related reviews. We have highlighted gaps that exists in research papers..

1.

“A new black carbon sensor for dense air quality monitoring networks”

Low cost air pollution sensors are emerging and increasingly being deployed indensely distributed wireless network that provide more spatial resolution than is typical in traditional monitoring of ambient air quality. However The quality of air is a major concern in modern cities as pollutants have been demonstrated to have significant impact on human health. Moreover, changes in urban arrangement, activities, or regulations may affect considerably the monitoring model, especially when budget constraints prevent from relocating stations or adding new ones to the network. In this chapter we discuss a different approach to environmental monitoring through mobile monitoring devices implementing a Vehicular Sensor Network (VSN) to be deployed on the public transport bus fleet of Palermo.

2. GUISEPPE LO Re, Daniele Perilal vatore devide varsallo

“ Urban air quality monitoring using vehicular sensor networks”

The quality of air is a major concern in modern cities as pollutants have been demonstrated to have significant

impact on human health. Moreover, changes in urban arrangement, activities, or regulations may affect considerably the monitoring model, especially when budget constraints prevent from relocating stations or adding new ones to the network. In this chapter we discuss a different approach to environmental monitoring through mobile monitoring devices implementing a Vehicular Sensor Network (VSN) to be deployed on the public transport bus fleet of Palermo.

3. K.S.E. phalon A kimar,and Gerhard P.hancke

“Air quality monitoring system based on ISO | IEC |IEE standard”

An air quality monitoring system (AQMS) based on the IEEE/ISO/IEC 21451 standards is presented. In the development of an AQMS, we have used the GSM wireless communication module. The developed system is capable of the real-time measurement of air polluted gases, such as CO₂, CO, NO₂. Hardware and software for an AQMS was designed and implemented. The AQMS uses an array of sensors to take the measurements of the ambient air surrounding it and wirelessly transmits the data to the base station. A graphical user interface (GUI), which makes it easy for end user(s) to interact with the system, was developed. Gas concentration values are plotted on the GUI.

[4] Swati Dhingiaia,Rajasekhara Babu Nandala,Amir H Gundomi,Rizwan Patan

“Internet of things mobile-Air pollution monitoring system.”

Internet of Things (IoT) is a worldwide system of “smart devices” that can sense and connect with their surroundings and interact with users and other systems. To overcome the problems of existing systems, we propose a three-phase air pollution monitoring system. An IoT kit was prepared using gas sensors, Arduino integrated development environment (IDE), and a Wi-Fi module. This kit can be physically placed in various cities to monitoring air pollution. The gas sensors gather data from air and forward the data to the Arduino IDE. The Arduino IDE transmits the data to the cloud via the Wi-

Fi module. We also developed an Android application termed IoT-Mobair, so that users can access relevant air quality data from the cloud. If a user is traveling to a destination, the pollution level of the entire route is predicted, and a warning is displayed if the pollution level is too high. The proposed system is analogous to Google traffic or the navigation application of Google Maps. Furthermore, air quality data can be used to predict future air quality index.

[5] **Nishant Kumar Singh**

“Modelling the Application of Air Pollution Monitoring System Using IOT in Smart Buildings.”

This research aims to use sensors to develop a framework for detecting weather emissions and measuring air quality in smart buildings. The suggested sensors are used in this application to measure and collect temperature, humidity, CO₂, and air quality data. The key goal of the paper is to monitor the weather, which can be done remotely with the aid of an Arduino UNO and the Internet of Things. This paper suggests a Real-Time Air Quality Control Device for smart buildings that will track air emissions data in the form of chemical and biological contaminants in the environment in the immediate region of indoor and outdoor areas. If the Air Quality Index (AQI) crosses a pre-set level, a short message system (SMS) transmits the unit to a cell phone in a dangerous state or saves data in think speak's cloud storage.

[6] **Ennedy Okokpujie, Etinosa Noma-Osaghae, Odusami Modupe, Samuel John and Oluga Oluwatosin.**
“ Smart Air Polluting Monitoring System ”

Air pollution affects our day to day activities and quality of life. It poses a threat to the ecosystem and the quality of life on the planet. The dire need to monitor air quality is very glaring, owing to increased industrial activities over the past years. People need to know the extent to which their activities affect air quality. This project proposes an air

pollution monitoring system. The system was developed using the Arduino microcontroller. The air pollution monitoring system was designed to monitor and analyze air quality in real-time and log data to a remote server, keeping the data updated over the internet.

[7] **Harsh N. Shah, Zishan Khan ,Abbas Ali Merchant,Moin Moghal, Aamir Shaikh , Priti Rane**
“IOT Based Air Pollution Monitoring System”

Air pollution is the biggest problem of every nation, whether it is developed or developing. Health problems have been growing at faster rate especially in urban areas of developing countries where industrialization and growing number of vehicles leads to release of lot of gaseous pollutants. Harmful effects of pollution include mild allergic reactions such as irritation of the throat, eyes and nose as well as some serious problems like bronchitis, heart diseases, pneumonia, lung and aggravated asthma. According to a survey, due to air pollution 50,000 to 100,000 premature deaths per year occur in the U.S. alone. Whereas in EU number reaches to 300,000 and over 3,000,000 worldwide. IOT Based Air Pollution Monitoring System monitors the Air quality over a web server using Internet and will trigger an alarm when the air quality goes down beyond a certain threshold level, means when there are sufficient amount of harmful gases present in the air like CO₂, smoke, alcohol, benzene, NH₃, LPG and NO_x. It will show the air quality in PPM on the LCD and as well as on webpage so that it can monitor it very easily. LPG sensor is added in this system which is used mostly in houses. The system will show temperature and humidity.

[8] **Cynthia J , Saroja M.N.,Parveen Sultana , J.Senthil**
“IoT-Based Real Time Air Pollution Monitoring”

Humans can be adversely affected by exposure to air pollutants in ambient air. Hence, health-based standards and objectives for a number of pollutants in the air are set by each country. Detection and measurement of contents of the atmosphere are becoming

increasingly important. Careful planning of measurements is essential. One of the major factors that influence the representativeness of data collected is the location of monitoring stations. The planning and setting up of a monitoring station are complex and incurs a huge expenditure. An IoT-based real time air pollution monitoring system is proposed to monitor the pollution levels of various pollutants in Coimbatore city. The geographical area is classified as industrial, residential and traffic zones. This article proposes an IoT system that could be deployed at any location and store the measured value in a cloud database, perform pollution analysis, and display the pollution level at any given the world of automation, things are getting automated, but the adverse effect is pollution. It is important to reduce the pollution level present in ambient air. Air pollution is the introduction of chemicals, particulates, biological materials, or other harmful materials into the earth's atmosphere, possibly causing disease, death to humans, damage to other living organisms in natural or built environment. One of the major issues in India is air pollution. Coimbatore city, the "Manchester of South India" is one of the smart cities in India. National Ambient Air Quality Monitoring station is already functioning in three locations.

[9] Jung Hoon Kim , SungJun Kim, WoonYong Han
"Development of an IoT-Based Indoor Air Quality Monitoring Platform"

IoT-based indoor air quality monitoring platform, consisting of an air quality-sensing device called "Smart-Air" and a web server, is demonstrated. This platform relies on an IoT and a cloud computing technology to monitor indoor air quality in anywhere and anytime. Smart-Air has been developed based on the IoT technology to efficiently monitor the air quality and transmit the data to a web server via LTE in real time. The device is composed of a microcontroller, pollutant detection sensors, and LTE modem. In the research, the device was designed to measure a concentration of aerosol, VOC, CO, CO₂, and

temperature-humidity to monitor the air quality. Then, the device was successfully tested for reliability by following the prescribed procedure from the Ministry of Environment, Korea. Also, cloud computing has been integrated into a web server for analyzing the data from the device to classify and visualize indoor air quality according to the standards from the Ministry. An application was developed to help in monitoring the air quality. Thus, approved personnel can monitor the air quality at any time and from anywhere, via either the web server or the application. The web server stores all data in the cloud to provide resources for further analysis of indoor air quality. In addition, the platform has been successfully implemented in Hanyang University of Korea to demonstrate its feasibility.

[10] Ashish Jaiswal, Megha Kamble
"Research on an IoT Based Air Pollution"

To keep people healthy, the air they breathe needs to be of high quality. Nearby locations have been found to have high levels of hazardous substances and air pollution. The suggested system measures air quality parameters such as IAQI, which is an effective technique to detect poor air quality. System has ESP8266 to link to IOT platform and pass pollution information to the staff. The ability to identify environmental contaminants improves self-care.

We're building an IOT-based pollution monitoring system to track the quality of the air using an internet server as a data source. Monitoring systems currently in use have poor precision and sensitivity, and require lab testing to verify results. As a result, better surveillance systems are required. Because of factors such as industry, urbanisation, population growth, and vehicle use that can harm human health, pollution levels are rising rapidly. In order to monitor the quality of the air, an internet-based web server monitoring system called an IOT-based system is used. It will sound an alert if the air quality deteriorates beyond a specific point, i.e. when dangerous gases such as CO₂, smoking, alcohol, benzene, NH₃, and NO_x are present in substantial

squantities in the atmosphere. It will display the air quality in parts per million (PPM) both on the LCD and on the webpage, making it simple to keep tabs on pollution levels.

EXPECTED OUTCOME

Once the website is ready with all the functionality it is expected from the system that website should,

- Automatic IV Bag Monitoring and Alert system is useful for the new technologies and easy to manage and handle it anywhere.
- Data Logging as well as IOT Online Transmission is use to provide all type of notification to the particular nurse device.
- Easy to operate in anywhere in the hospital at a time whole patients can handle a nurse.
- Makes it easier for a single individual to manage multiple patients as the way of nurse.
- Useful for managing large number of patients during times of crisis.
- It improves the quality of work in the hospitals and as per the schedule every nurse will work.
- The IOT based technology improves the efficiency of the project perform in an any desk site as well as web browser.

CONCLUSION

As we can see this review paper including some of the updating of the another reviews paper as per the studied on it. We conclude that this project is implemented on the real time problems that totally need in the today world. As per the another reviews we made it some of in different level of the project and literature review paper 7 Hence, we would like to perform this project in the hospital via clinic and also updating review paper. As per the project implementation. This is progressive project to enhanced this in best suitable platform to improve review of the project.

REFERENCES

- [1] S Ram Kumar, S Saravana Kumar and M Sukumar, "Remote monitoring the glucose bottle level in hospitals", *Sri Vidya College of Engineering & Technology*, 2017.[Google Scholar](#)
- [2] M. Hossain and G. Muhammad, "Cloud-assisted Industrial Internet of Things (IIoT) – Enabled framework for health monitoring", *Computer Networks*, vol. 101, pp. 192-202, 2016. Show in Context [CrossRef](#) [Google Scholar](#)
- [3] World Health Organization. Model list of essential medicines. Available at http://www.who.int/medicines/publications/essential_medicines/20th_EML2017_FINAL_amendedAug2017.pdf?ua=1; accessed December 28, 2017.
- [4] G. I.Voss and R. D. Butterfield, "Parenteral Infusion Devices", *The Biomedical Engineering Handbook: Second Edition*, Ed. Joseph D. Bronzino, Boca Raton: CRC Press LLC, 2000.
- [5] Han PY, Coombes ID, Green B: Factors predictive of intravenous fluid administration errors in Australian surgical care wards. *Qual Safe Health Care* 2005; 14(3): 179–84.