

# An Affordable Air Profanation Control and Electricity Producing System

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**Abstract:** Be it an ice factory, leather industry or a cottage industry, the manufacturing process of all of them must generate wastes in liquid and solid apart from emitting smoke if its process is so mechanized and production is made in bulk. There are green laws in every country which not only prescribe limits for all kinds of factory pollution but also set rules and regulations which every factory must follow in its manufacturing process. The power industry makes a significant contribution to air pollution, a variety of air pollution control technologies have been adopted to reduce emissions of nitrogen oxides, sulphur dioxide, and particulate matters. In this way no factory could present any excuse of its unawareness after violating any environmental law. So the need of hour is to convince factories to go green in their entire manufacturing process and eventually grow their business. Most of the environmental laws related to industrial pollution prescribe punishments of fine and imprisonment to those industries which violate them. However, the deployment of these technologies affects the operation of the power plants and of the power system, this work we are going to generate electricity by collecting the polluted air.

## I. INTRODUCTION

With the fast development of the industrialization and urbanization process in the world, environmental pollution is now a common problem in most of the countries. Environmental pollution includes; air pollution, water pollution and soil pollution. Air pollution can be defined as the presence of contaminants or pollutant substances in the air that interfere with human health or welfare, or produce other harmful environmental effects. These pollutant substances usually result from vehicle emissions, Industrial emissions and volatile organic compounds. The health issues caused by air pollutants are difficulty in breathing, coughing and aggravation of existing respiratory and cardiac conditions. The World Health Organization states that 2.4 million people die each year from causes directly attributable to air pollution, with 1.5 million of these deaths attributable to indoor air pollution. Based on the fact mentioned above, there is a need to focus on air pollution monitoring activities. When burned, these fossil fuels emit harmful gases including carbon dioxide and sulphur dioxide which increase the amount of greenhouse gases in the atmosphere resulting in global warming. Air pollution much worse in highly populated cities where more factories emit pollution in close proximity to humans.

## II. LITERATURE SURVEY

**D. A. Bies et al.** gave the applications of wireless sensors to monitor the various environmental activities like air pollution, noise level, water level, greenhouse monitoring, agriculture monitor etc. They discuss but Wireless device networks is also accustomed management the pollution inside the shut setting i.e. with the help of varied device nodes we are going to live pollution levels in urban areas. Then they give a number of the benefits of victimisation WSN to manage the sound pollution.

**Batmunkh TS** had measured standards on the content of the polluting component based on the tests. It survey polluted air emitted from the power plants

**Nihal Kularatna** had mainly concentrated on major air polluted gases such as CO<sub>2</sub>, NO<sub>2</sub>, SO<sub>2</sub>, O<sub>3</sub> using semiconductor sensors. It can also measure a common air polluted concentration using a semiconductor sensor array and the IEEE 1451 standard and measure the ambient air pollution levels of the above mentioned gases. The major problem is that while adding relative humidity and temperature sensor it does not measure the IEEE 1451 standard.

**Young Jin Jung** had design an air pollution monitoring system which involves a context model and data acquisition policy and it is used for understanding the status of air pollution on the remote place. It does not purify the air content as shown in figure 1.

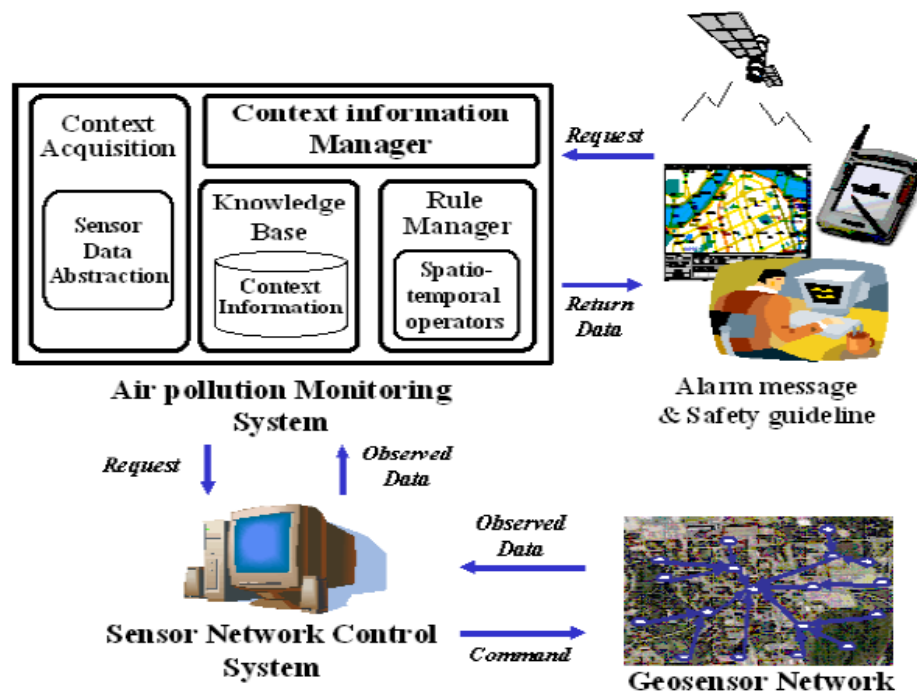


Figure 1. Air pollution monitoring system

**Sukwon Choi et.al.** focus on the design and implementation of a sensor board for air pollutant monitoring applications. The hardware and software issues are discussed to explore the possibilities of a practical WSN-based air pollution monitoring system. In this paper, they have determined the various characteristics of the gas sensors and their practical implications for air pollutant monitoring systems.

**A.R.Ali Ali** had consists of mobile data acquisition unit(mobile-DAQ) gathers air pollutants levels (CO,NO<sub>2</sub>, and SO<sub>2</sub>), and packs them in a frame with the GPS physical location, time, and date. In this system the pollution-Server is interfaced to google maps to display real-time pollutants levels and locations in large metropolitan areas and it also reports real-time pollutants level and their location on a 24-h/7-day basis. The data shows the waste levels and their conformance to native air quality standards.

**Tajne K.M et al.** had explained environment Monitoring requirement for the better measurement of the pollutant concentrations and their variations. The planned pollution observation contains of detector nodes and a communications system that permits the information to achieve a server.The detector nodes gather information autonomously and also the information network is employed to pass information to at least one or a lot of base stations, that forward it to a detector network server.They give the temporary description of every element of pollution observation .

**Sherin Abraham,Xinrong Li** had determined the air quality monitoring system helps in the detection of and improvements of indoor air quality in this paper they presents low-cost air quality monitoring wireless sensor network system developed exploitation arduino,XBee modules and small gas detector.The performance of the system ar incontestable by examination mensuration results of our system and an expert grade air quality measuremet device.

**Jha, Mukesh et.al.**presented a system for monitoring the environmental parameters, modeling and manipulating micro climate of urban areas. The system is implemented for the adaption of efficient urban infrastructure after analyzing the urban micro climate.

**Somansh Kumar** had measured that air pollution leads to adverse effects on Human health, climate and ecosystem. Air is getting polluted because of release of Toxic gases by industries, vehicular emissions and increased concentration of harmful gases and particulate matter in the atmosphere. Particulate matter is one of the most important parameter having the significant contribution to the increase in air pollution as shown in figure 3.

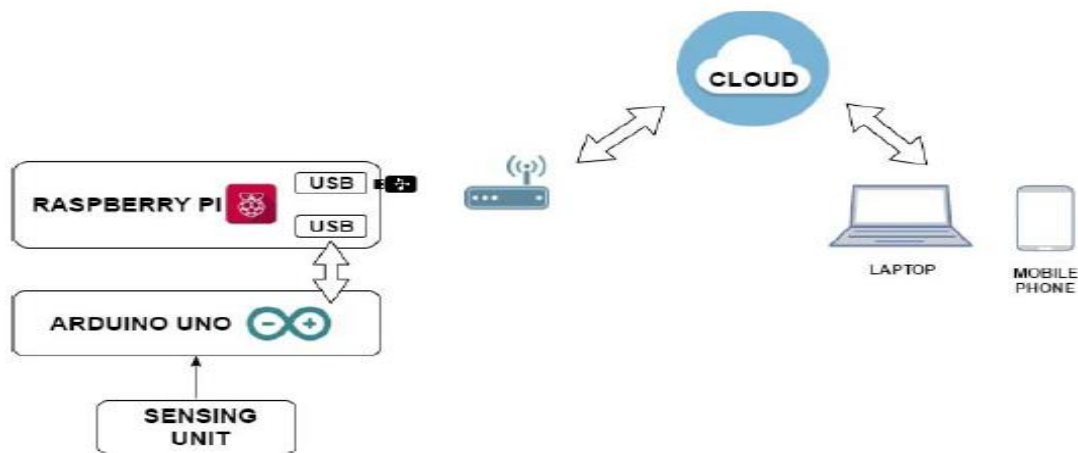


Figure 3.Simplified diagram of proposed system

**Baralis, Elena et.al** proposes a business intelligence engine (APA). The system is designed to aware the public International Conference on Computing, Communication and Automation (ICCCA2017)1342 about the quality of air being affected by different factors like pollutants, toxic gases etc. Analysis of air pollution from different perspectives like meteorological data, pollutants and traffic data using APA is done. The system helps the people to realize their activities impact on deteriorating air quality.

**Xing Liu, Orlando** presented a comparative study on smart sensors, objects, devices and things in Internet of Things. The authors have also explained the definition and concepts of IOT in various different ways. The differences and similarities between the smart objects, smart things in IOT are presented in tabular form.

**Tania Singla, Mukhdeep Singh Manshahia** had analyzed the usage of wireless sensor networks for pollution control and monitoring. Using WSN for environmental observance and pollution management is advantageous as it's a simpler manner of assembling information because the device nodes area unit lightweight in weight, easy to install, low power and low cost. They can store a restricted supply of energy and don't have any trouble of cables and has quality. Hence the flexibility, fault tolerance, high sensing fidelity, low power, low cost and fast preparation characteristics of wireless device networks produce several new and exciting application areas for remote sensing.

**Pradeep D** had analyzed a technique is cloud based air quality monitoring system. It does not purify the air content. It will promote the public awareness about state of air pollution and how much important it is to reduce it. There will be news, surveys relating to pollution in numerous countries, other ways to scale back pollution on the web site.

**Shete, and Agrawal S.et.al.** provide the framework for monitoring the city environment. Low cost Raspberry pi issued for implanting the system. Parameters like carbon monoxide, carbon dioxide, temperature and pressure are measured but no emphasis is given on particulate matter which left the environment monitoring incomplete.

### III. PROPOSED SYSTEM

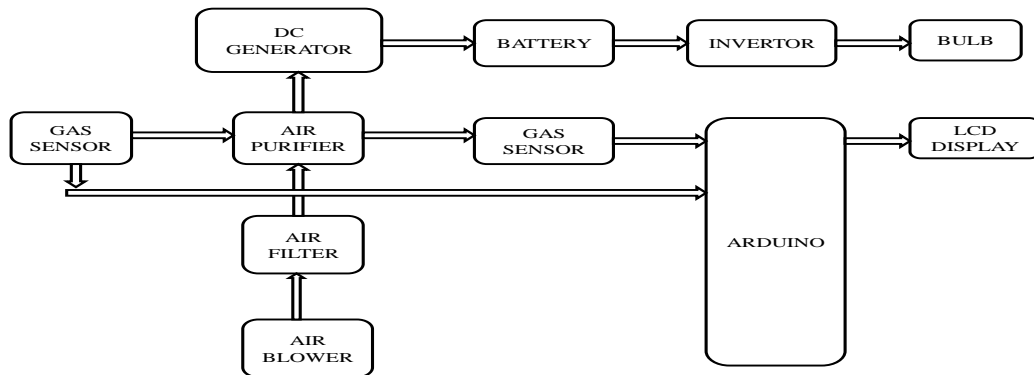
In factories, the pollution can't be control since it emits some fossil fuels, gases in the existing system. The power industry makes a significant contribution to air pollution, a variety of air pollution control technologies have been adopted to reduce emissions of gases from industries. , there is no method for controlling the polluted air and purifying it. But in our proposed work we are purifying the polluted air and generating power from it.

If there exists over pollution from the factories, the government may take severe action of closing the particular factories. Thus this leads to decrease in the production field. In our proposed work, there is no intervention in the production field since we are controlling the pollution and generating electricity.

A pollution sensor can only detect pollutants that come into contact with it, and thus such a sensor does not have a detection zone like presence sensors The majority of deployment approaches uses a simple detection model which assumes that a sensor is able to cover a point in the environment if the distance between them is less than a radius called the detection range. A pollution sensor detects pollutants that are brought in contact by the wind.

In this project work, purifying the polluted air and production of electricity is done. The design consists of air filter bus, gas sensor, LCD and the controller.

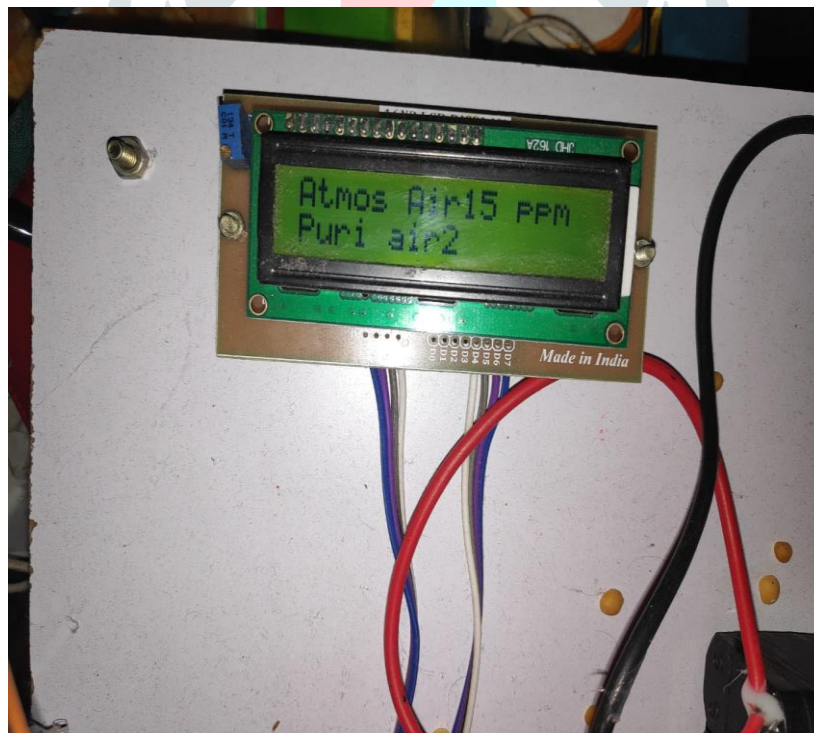
#### IV. METHODOLOGY



#### CIRCUIT EXPLANATION

The pollutant air which consists of pollutant gases is blown with a high speed by the blower in order to transmit the pollutant air inside the purification filter. The air filter bus is used to purify the pollutant air and it sends out the purified air. This purified air blows inside the generator. Generator will produce the electricity of 12v from the purified air. Gas sensor is used to determine the gas in and gas out. LCD will display the electricity and the gas in and gas out of the filter.

#### HARDWARE IMPLEMENTATION RESULT



#### V. CONCLUSION AND FUTURE SCOPE

Till now, this paper is a theoretical idea to install a windmill in an industry. But we may have a great success from this assumption. Though the output power is not quite enough in quantity because of some factor but step by step improvement can make a dynamic change in energy resources. Our future work could be focused on how could the velocity be increased as we see that the power production is largely depends upon the velocity of air.

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