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Review on Pollution Monitoring Systems

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Abstract--- *Toxic components that have affected the balance of the ecosystem. The inappropriate persecution of such components has directed to an intensification in pollution of the fundamental elements of the ecological system that serve as a model for the looking after of human existence. Detecting contamination in a timely manner and finding the source of pollution is of paramount importa nce to sustainable development. These are roundabout of the key issues related to the preservation of harmonious coexistence among human beings and the environment. The emerging infrastructure of the Internet of Things and cloud computing offers a range of potential batch templates for the reasons set out above. The preceding paper puts light on certain of the systems surveyed and compares them all in order to investigate zones of advancement and relocate towards a better, additional robust and more convenient system for the same economic model.*

Index Terms--- *Toxic component, human existence, IOT, cloud computing, pollution, water pollution, air pollution.*

I. INTRODUCTION

Pollution is the incorporation of chemicals into the natural surroundings which trigger adverse reactions. Pollution may occur as a result of chemical products or electricity, including sound, heat or light. Contaminants, the elements of pollutants, maybe synthetic substances/energy or environmentally produced toxins. Recently, global warming itself has led to extensive hysteria between the world's residents about potentially dangerous impacts on the very entire planet. There are dual explanations of the problem mentioned above.

This review paper also reviews some articles, papers and news in order to find trending sources of pollution. After review, it was found that industries are the major contributing source of environmental pollution. Industries have poisoned our climate, particularly since the start of the industrialized revolution, in general as a consequence of the growing use of fossil fuels. In the 19th generation, and for a considerable portion of the 20th century, carbon was used to build machinery work more efficiently, eliminating human strength. While industrial pollution primarily triggers air pollution, soil and water contaminants can also arise. This is especially the case among power-generating companies, such as power-producing plants (maybe a dam, a nuclear reactor, or some other form of the plant).

The first is to prevent the proliferation of hazardous contaminants another is to remove toxins in all three regions of the global ecosystem. For developers trying to travel for green energy at one side, tech-savvy people could offer a solution by IOT for both strategies. The Internet of Things is a wide variety of technique that interacts with one another on the basis of integrated nodes. It is also the internet phones that are equipped with detectors that gather details and transmit it via a wired / wireless network where evidence can be processed in order to take applicable action. Environmental degradation

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happens when chemicals irradiate the local environment.

Pollution disrupts the equilibrium of our habitats, impacts our regular lives and induces human disease and global climate change. Pollution has reached its peak owing to the growth and transformation of our lives. With the advancement of science and engineering, the human condition has expanded exponentially. Humans have been captives of their own development.

II. LITERATURE REVIEW

In the year 2015, many papers were published which discloses pollution monitoring systems. Those systems were using the Internet of Things, cloud computing, wireless sensing networks. The paper [1] utilizing evidence-based methods, the traditional air automated tracking system has high accuracy, but large volumes, high costs and a single data category make it approximately unmanageable for wide-scale deployments. Depending on the operation of the Internet of Things (IOT) in the area of environmental protection, this paper proposes a kind of "real-time air pollution tracking and prediction framework". By means of IOT, this program could minimize hardware costs to "1/10" as now. The unit could be set up in a large volume in the control region to create a tracking sensor network. In addition to the roles of the traditional air automated control system, it also demonstrates the role of estimating changes in air pollution over a certain period of time by gathering data generated by the front-end vision method utilizing neural network software.

The air quality control and prediction system set out in this paper suggested a good solution to the problem of air em issions. The need for a wide number of detectors guarantees precision of monitoring lowers monitoring costs and makes surveillance results in the monitoring region more standardized and ideal. A significant number of existing data generated by the front-end sensor network allows the study of a large amounts of data which is more straightforward and efficient in the context application layer, providing a real and accurate decision-making foundation for the post-pollution emergency response.

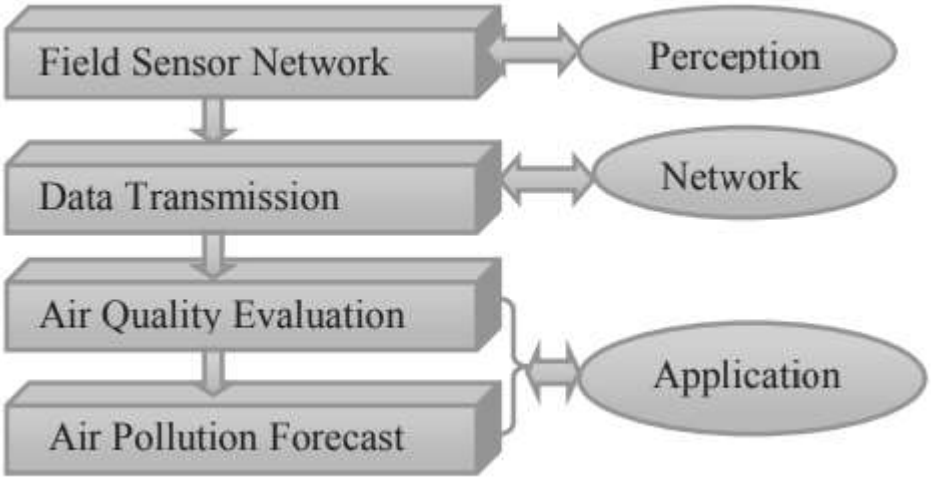

Figure 1 block diagram of the system

Figure 1, illustrates the block diagram of the system as disclosed in the paper [1] . The system comprises of four layers. First of all a sensor network is established in the pre-defined field. Multiple quantity of sensors are mapped in the

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field. The sensors senses the data and sends the sensed data through the established network onto the next layer.

After data transmission process, air quality is evaluated Main indices of environmental quality are identified in the assessment of air quality, by evaluating performance indexes like temperature, hazardous gas intensity, particle density, using external factors as criteria for various implementations and utilizing genetic algorithms and neural network technology[2], [3]. The feature specification of the pollutant prediction network is described in table 1.

Project	Parameter setting	
Layer number of network	Input layer. Hidden layer. Output layer	
The nodes of each layer	Input layer	24
	Hidden layer	4
	Output layer	1
Transfer function	Hidden layer	Tansig
	Output layer	Logsig
Learning algorithm	Bayesian Regularization	
The max training times and expectation error	5000	
	0.001	
Initialization method of weight	Initial weight of hidden layer *0.1, output layer set positive and negative initial weight equally.	
Division method of samples	Training set: Validation set: Test set=2:1:1	

Figure 2 Feature specification

In year 2016, another invention was disclosed in paper [4]. Supervision for environmental pollution is becoming a fundamental requirement for cities around the world. Apparently, the most comprehensive way to track air and water pollution is through fixed seismometers, which are costly and difficult to build. To address this issue, they have created Eco-Sensor, a platform for tracking air pollution using mobile sensors. It is built using off-the-shelf equipment such as Waspmote (based on the Arduino platform), low-end indicators and Raspberry Pi modules. Eco-Sensor detects industrial pollution leveraging built-in sensors and sends collected information to an Android-based device which shows the degree of environmental pollution to the consumer in real time. Eco-Sensor also maintains numerous emission trace amounts on a cloud-based database to monitor the transmission of emissions. The cloud database utilizes imported information, along with highly accurate data allocated by the current air monitoring system, to construct precise emissions distribution maps utilizing kriging-based spatial forecasting techniques. Eco-Sensor is a full environmental control system that incorporates low-end detectors, devices and cloud computing to track pollution rates with high spatial granularity. The solution is focused on the use of a remote detector to quantify emissions, a tablet to include updates on environmental quality in real-time, and a portal to transfer collected data to a remote server. Eco-Sensor also offers a database platform for information

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processing and simulation[5], [6]. Figure 2 and 3 illustrate the analysis and architecture presented by the paper [4].

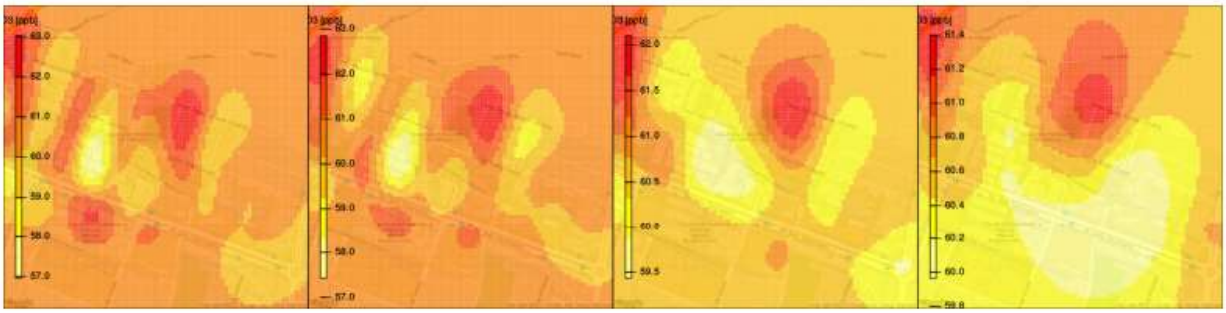

Figure 3 Research of the release of ozone for various collection times

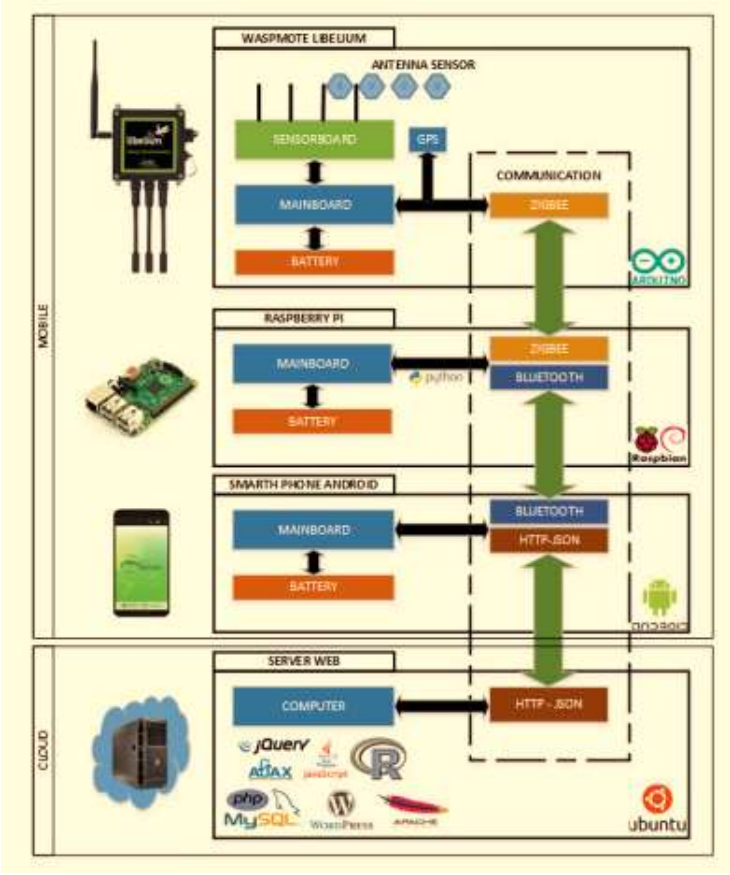

Figure 4 architecture presented by paper

In the year 2017, another system for analyzing environmental was introduced in paper [7]. With the introduction of IOT-based technology, the service sector as a whole is in a place to experience profound and necessary improvements in the sense of the industrialization. Digital Tracking methods for environmental pollution variables utilizing Internet of Things (IOT) technologies allow us to collect parameters such as pH, temperature, humidity and concentration of carbon monoxide gas, etc. The use of the detectors also allows a strong control of the environmental contamination generated by

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the company. This paper explores the electronic pollution tracking for sectors focused on LabVIEW to regulate environmental damage caused by unregulated disposal of waste. This paper recommends the usage of the AT-mega 2560 Arduino module that extracts the humidity and temperature parameters from the DHT-11 detector, the carbon dioxide intensity utilizing MG-811 and reports it to the online database using MYSQL.

A platform is built and managed to monitor and control, offering a true IOT nature. Mobile software is also built to improve performance and mobility. The suggested study continues with the control portion. The information comes from the detectors. The "DHT-11 and the Sensors were attached to the Arduino deck. In the programming portion, when the serial output is supplied to the Arduino panel, the data is taken from both the sensor and shown on the Arduino screen. The serial output is given by LabVIEW to the Arduino panel. H' is the serial entry to the Arduino board to get the humidity value,' T' is the temperature value and' P' is the pH value". The IOT definition can be extended to a variety of applications. This paper therefore, introduces the use of IOT in the detection and management of environmental pollution. In this way, it can also eliminate any catastrophic accidents in the sector and provide a strong control of environmental contamination. LabVIEW technology has made it simple to use IOT with an accessible graphical user experience framework for develo pers and consumers.

The price of installation is very inexpensive as the detectors and microcontrollers are easily available. The internal database platform has improved versatility by upgrading all current industry specifications over a shared network. In the future as per the paper [7], "the camera can be updated with image processing algorithms to allow a fully automated safety system, such as fire alarm, gas leakage. It allows automatic control activities to be produced in the absence of an authorized user".

In 2018, with the advancement in technology, another system with the same intend was developed. Paper[8] discloses the invention along with its benefits and some downfall. The effect of environmental quality on safety and the enjoyment of life is well known. In many cultures, marginalized seniors or young people spent much of their time enclosed. Tracking of enclosed air quality is true of vital importance for human health. Technicians and scientists are gradually pinning their hopefulness on the development of true-time systems utilizing cellular sensor networks. The position of the gateway in the storage of obtained air quality information and its effective distribution to end-users via a "web-server" is highlighted in this research.

A system for the preservation and recovery of the information collected in the aftermath of an Internet collapse is introduced. The framework is tailored to the Internet-of-Things (IOT) open-source web-server platform, named "Emoncms", for live monitoring and long-term storing of collectedinformation. In fact, the modular design of the device requires scalability and, as a result, the network may incorporate a wide or sma ll variety of nodes of detectors to accommodate different applications. The specifics of the hardware and software elem ents of the end devices have been identified[9]–[14].

III. CONCLUSION

This review paper have shown a vast development in technology in wireless communication which have resulted in production of system based on wireless communication for monitoring ecological pollution such as air, water, soil and etc. The output of these systems could be employed by higher authorities of any country in order to analyze the monitored data by which they can take some preventive measures that includes but not limited to warning messages and some

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actions. Furthermore, integration or some advancements in these system can result in automatic response generator which will generate some kind of solution to increase in pollution also these systems can used for warning or creating awareness. This review would assist in development of an efficient solution monitoring system.

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