

# SMART APPROACH FOR WEATHER MONITORING

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## **Abstract**

*The IOT based Weather Monitoring and Reporting System project is used to get Live reporting of weather conditions. The temperature, precipitation, humidity and rain levels will be controlled. Suppose scientists/nature observers want to track shifts, such as volcanoes or rainforests, in a specific area. And these people come from various locations in the world. In this case, the weather forecasting system based on SMS has some limitations. Since it sends a few numbers via SMS. And as the number of mobile numbers increases, the time for sending SMS increases. In order to know the weather data of a particular location, they have to visit certain unique places. Where it can be seen by anyone.*

**Keywords:** *IoT, Weather, Monitoring, Forecast, GSM*

## **I. INTRODUCTION**

Today's era monitoring of weather is playing an important role in many situations. It is very necessary to monitor weather. Weather monitoring is important in growth of good crops, in industries this weather monitoring system ensures safe conditions for working, etc. Continuous advancement in technology has made monitoring the parameters of the environment much easier compared to previous technology. These sensors are Electronic devices which are widely used to collect physical and environmental parameters. By using sensors to monitor climatic conditions, which provide correct results, the results will be accurate and the entire proposed system is energy efficient and provides fast response. The proposed system describes weather power in a weather monitoring station[1]. This proposed system consists of wireless technology, which is also connected to GSM modem. Here, the system observes the conditions of weather and updates the information on the web server. The reason to update data on a web server is because anyone can observe the weather condition of a particular area from anywhere and anytime. The proposed system consists of many sensors to collect data of different parameters of the environment such as wind sensor, temperature sensor, solar sensor. All these

sensors are eligible for collecting the corresponding environmental parameters. The proposed system can be used in large buildings and companies as well as wherever users want to know the environmental parameter[2].

### Limitations of the existing Weather Monitoring System

- i. Existing weather monitoring systems which generally consist of heavy machinery which have a number of moving parts which require timely maintenance and need to be observed and frequently replaced.
- ii. Requirements of Power are one of many major challenges because these devices are generally placed far from main power supply. Which made the device costly?
- iii. Thermometers are used to measure external environmental Temperature; But accurate measurement data is not updated which needs to continuously temperature should be checked continuously for any change in environmental temperature.
- iv. d). Information collected by the devices needs to be transferred manually from the existing system to a computer with the help of a cable.
- v. Existing systems capture huge space which makes installation of systems not easy in remote areas and cities which have limited space.
- vi. The devices which are used are too costly and also have high installation cost as well as maintenance cost.
- vii. The present system faces problems like delay in cautioning and does not inform people about the worst weather condition and instant overcast weather.

The main aim of this proposed system is to introduce electronic devices or networks which observe and capture temperature and transfer information to the Web server for data analysis. An Arduino is used as a simple brain of the system. Arduino is used as a microcontroller, A GSM module is used to establish Internet connection. The sensor regularly monitors temperature changes and other weather parameters and further sends data to the microcontroller. The microcontroller transfers the data for its database[3].

### Advantages of weather monitoring systems are

1. Weather mentoring system based on IOT using Arduino
2. Uno is fully automated.
3. Any human attention is not required.
4. With help of this proposed system users can get prior alert of climate conditions.
5. The proposed system is cost efficient and maintenance is also low.
6. System also has high accuracy.
7. Self-Protection
8. Monitor Environment in a smart way.
9. Efficient.

Climatic change and environmental monitoring have received much attention recently. Man wants to stay updated about the latest weather conditions of any place like a college campus or any other particular building. Since the climate is changing so quickly, the weather stations should be there. We present a weather station here in this paper that is very useful for any place. This IOTT-based weather station is (internet of things). It is fitted with environmental sensors used at every given location for measurements and reports them to the cloud in real time. We have used Arduino Uno and various environmental sensors such as DHT11, soil moisture sensor, and rain drop sensor to achieve this[4]. The sensors continuously sense the weather parameters and continue to relay them over a wifi link to the online web server. The weather parameters are uploaded to the cloud and live monitoring of weather information is then generated. This paper also reflects on the application of IOT to the current generation of environmental knowledge and offers a new framework for future monitoring of the environment. In particular, the system was designed with a view to building a smart city by providing the weather update of any specific location, such as a specific office or space[5]. It is the future technology of one location that links the entire planet. All objects, objects and sensors can be linked to share data obtained at different locations and processes/analyses that organize application data such as traffic signaling, mobile health monitoring in medical applications and methods of industrial safety assurance, etc. According to the predictions of technology experts, 50 billion items will be connected to the IOT by 2020. IOT provides a wide range of system communication with different protocols and different application properties to achieve maximum machine-to-machine interaction. The difficulties generated in many weather Stations at present day all the weather Stations Consists of their Own Data Centre to observe and transmit the weather parameter information to Display. Each and every weather station needs Cores to introduce their own center for data collection in particular places. The Weather System based on IoT acts as a Weather Station and updates the Data on the Web server. So, by using IoT Based Weather monitoring System many problems resolve like the cost of equipment and users can also access the information remotely through internet Devices and Websites[6]. IOT is a comprehensive network that links devices such as sensors, actuators, mobile phones, etc. through the internet to capture and share data. These can be managed through existing networks and are also connected to other devices, providing accurate and efficient performance. For more precision enhancement, algorithms such as swarm intelligence may also be applied. IOT may be used for environmental protection, such as earthquakes, tsunamis, soil conditions, and for sensor monitoring or protection of wildlife. These sensors can sense a large geographical area and can be mobile. In the present system a weather reporting system is built followed by an android application which displays the data which is being extracted from the weather reporting system. In our project we are using sensors which are capable of covering a small area (for example small garden, a house) and the data which is being extracted from sensors is store in cloud for this storage we are using a website called <https://thingspeak.com/> which is basically used for IOT platform projects which gives free cloud storage space, so it is beneficial for students project . From the cloud storage space we extract the entire weather data to the android application using the API key[7].

## II. CONCLUSION & DISCUSSION

A foundation is set for an efficient solution for tracking the weather conditions of a specific location and making the information available anywhere in the world. The technological advances behind this is Internet of Things (IoT), which is an efficient and effective solution for linking the things to the web and to connect the entire world of things in a network. Here things could be like electronic gadgets, sensors, and automotive electronic devices. The system functions with tracking and monitoring environmental circumstances such as temperature, relative humidity, light intensity, pressure and quantity of rainfall with sensors and whenever these scores exceed a selected threshold limit for each an e-mail, an SMS alerts the appliance owner to take the required steps.

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