**Laxmi Charitable Trust’s**

**Sheth L.U.J College of Arts & Sir M.V. College of Science & Commerce**

**Andheri (E) Mumbai 400069**

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**CERTIFICATE**

This is to certify that the project entitled, " **Raspberry Pi Based Weather Reporting Over IOT**", is bonafied work of **SHIV BAHADUR VISHWAKARMA** bearing **Seat. No:** submitted in partial fulfillment of the requirements for the award of degree of BACHELOR OF SCIENCE in INFORMATION TECHNOLOGY from University of Mumbai.

**Internal Guide** **Coordinator**

**External Examiner**

**Date: College Seal**

**ABSTRACT**

Weather condition plays a very important role in our daily life. Collecting of data about the different parameters of the weather is necessary for planning in home and environments. Recent developments in Internet of Things made possible to collect the data.

This project represents the real time monitoring and updating weather conditions over the internet. The system monitors three parameters namely temperature, humidity and raindrop. These values are then displayed on LCD. When the area is dry it shows zero value. When the system detects raindrop, it shows the value of the increase in raindrop. When the temperature increases the value gets updated. The user can observe the weather status of a particular area from any remote location. For this purpose, we have used Raspberry Pi 4 board. Raspbarian operating system is selected to use with Linux Kernel for Raspberry Pi 4. Python Language is used for programming because IDLE understands Python. By readings, the user can get a fair idea of the weather of a particular area on the monitor. This system proves to be useful for knowing the weather of the localized area.

In this Project we have research of the latest IoT which key enabling technologies, major IoT applications in industries and identifies research trends and challenges. A main contribution of this project is that it summarizes the current state-of-the-art of IoT in industries systematically. The advancement of Automation technology, life is getting simpler and easier in all aspects. In today’s world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. This paper proposes that the industrial monitoring by using Temperature sensor, Rain Drop Sensor and Humidity Sensor, values to read the value and monitoring using Thing speak system via Raspberry pi 4.

**ACKNOWLEDGEMENT**

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**DECLARATION**

I hereby declare that the project entitled, “**Raspberry Pi Based Weather Reporting Over IOT**” done at place where the project is done, has not been in any case duplicated to submit to any other university for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university. The project is done in partial fulfillment of the requirements for the award of degree of **BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY**) tobe submitted as final semester project as part of our curriculum.

**Name and Signature of the Student**

Shiv Bahadur Vishwakarma

**Chapter 1**

**Introduction**

Weather or Climate is important part of human life. Sensors are essential components not only applicable to the industries for process control but also in daily life for safety of building’s and traffic flow measuring,

environmental parameters measurement. In weather monitoring, factors such as temperature, humidity and rain drop to be measured for this project, thus sensors have always been given the task for doing so. Main focus of project is to develop compact and powerful weather station. Data acquisition systems are very popular for consumer and industrial applications. The proposed system has three sensors that measures different parameters as stated above & for rain fall detection and wind direction speed measurement weather instrument is included. Raspberry Pi 4, acting as data logger process the converted output of sensors from analog to digital. The logged data can then be transferred to a desktop or any other monitor has GUI for further analysis. So by using easily obtained components and less complicated circuitry powerful weather station can be built Now a day’s various weather factors like wind and many other cause great impact on human’s day to day life. In raspberry pi based weather monitoring system which depends on combination of several sensors to be integrated has been proposed. Raspberry Pi will receive readings from various sensors and then process the data and then data will be available on cloud server for viewing of user at remote location Weather Monitoring can be done in either wireless or wired manner. The Raspberry is cheap, small and rugged which make it perfect for real world projects? For agricultural development and industrial management, the proposed system is useful.

**Background-**

Humidity, Temperature and Pressure are three basic parameters to build any Weather Station and to measure environmental conditions. This IoT based Project aims to show the current Humidity, Temperature and Pressure parameters on the LCD as well on the Internet server using Raspberry Pi, which makes it a Raspberry Pi Weather Station. You can install this setup anywhere and can monitor the weather conditions of that place from anywhere in the world over the internet, it will not only show the current data but can also show the past values in the form of Graphs.

We have used DHT11 Humidity & temperature sensor for sensing the temperature and BM180 Pressure sensor module for measuring barometric pressure. This Celsius Scale Thermometer and percentage scale Humidity meter displays the ambient temperature and humidity through a LCD display and barometric pressure is displayed in millibar or hPa (hectopascal). All this data is sent to server for live monitoring from anywhere in the world over internet.

This IoT based project has four sections. Firstly, DHT11 sensor senses the Humidity & Temperature Data and BM180 sensor measures the atmospheric pressure. Secondly Raspberry Pi reads the DHT11 sensor module’s output by using single wire protocol and BM180 pressure sensor’s output by using I2C protocol and extracts both sensors values into a suitable number in percentage (humidity), Celsius scale (temperature), hectoPascal or millibar (pressure). Thirdly, these values are sent to server by using inbuilt Wi-Fi of Raspberry Pi 3. And finally server analyses the data and shows it in a Graph form. A LCD is also used to display these values locally.

Server will provide very good tool for IoT based projects. By using server & website, we can monitor our data and control our system over the Internet, using the Channels and webpages provided by webserver. webserver will ‘Collects’ the data from the sensors, ‘Analyze and Visualize’ the data and ‘Acts’ by triggering a reaction.

We have to define some fields for the data as we want to monitor, like in this project we will create three fields for Humidity, Temperature and Pressure data.

**Objective-**