REVIEW PAPER ON WEATHER STATION FOR DOMESTIC PURPOSE

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ABSTRACT

A weather station can be described as an instrument or device, which provides us with the information of the weather in our neighboring environment. For example it can provide us with details about the surrounding temperature, barometric pressure, humidity, etc. Hence, this device basically senses the temperature, pressure, humidity, light intensity, rain value. There are various types of sensors present in the prototype, using which all the aforementioned parameters can be measured. It can be used to monitor the temperature or humidity of a particular room/place. With the help of temperature and humidity we can calculate other data parameters, such as the dew point. In addition to the above mentioned functionalities, we can monitor the light intensity of the place as well. We have also enabled to monitor the atmospheric pressure of the room. We can also monitor the rain value. The brain of the prototype is the ESP8266 based Wi-Fi module Nodemcu (12E). Four sensors are connected to the NodeMCU namely temperature and humidity sensor (DHT11), pressure sensor (BMP180), raindrop module. Whenever these values exceed a chosen threshold limit for each an SMS, an E-mail and a Tweet post is published alerting the owner of the appliance to take necessary measures.

INTRODUCTION

The Internet of Things (IoT) is a series of computer, mechanical and non-electronic systems, remote communication network setup, service, and regulation. The person in charge can monitor the central and external devices; switch on / off machines, transfer circuits between multiple devices, access devices and remote controls, etc [1]. A weather station is considered a scientific tool that enables the calculation of weather parameters dependent on environmental conditions either on the soil or sea to predict weather conditions and analyze climate data. Forecasting officially started in the nineteenth century [2]. The collected data enables the chosen position to be determined and validated. Two factors, temperature and humidity are valued mostly for the environment. Such factors fluctuate especially in places that have been influenced by the intensity of the sun's radiation and the perpendicular angle of the sun that radiates over a specific location depending on the tropical line's latitude. In reality, the environment is rendered as a jumbled and vital scheme because of the tight-grade results which could be dumped over the whole scheme in the event of a tiny change [3, 4]. Hence, the issue causes problems for far-reaching temperature forecasts, as estimation could only be feasible for a few days to come. Weather station experts thus remain incessantly day by day forecasting climate situations based on the scientific analysis of atmospheric conditions.
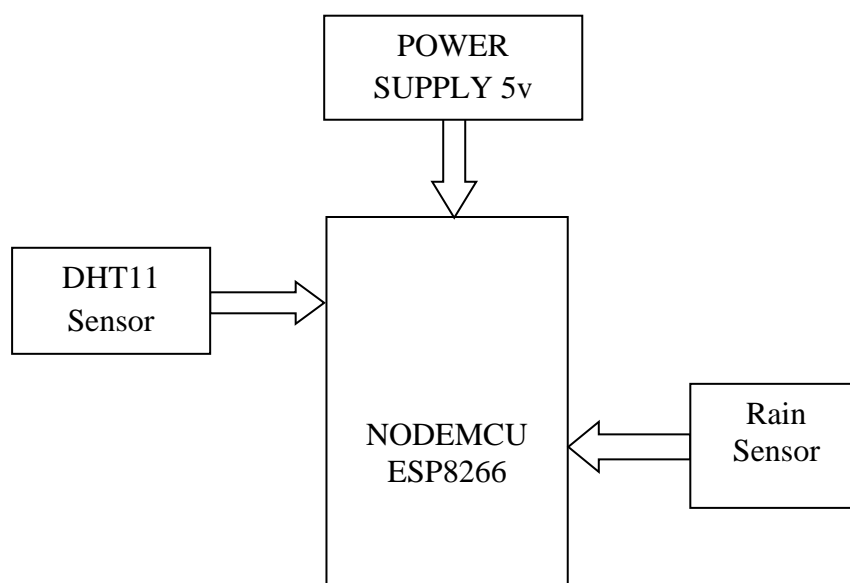
LITERATURE SURVEY

The IoT uses a wide variety of devices, protocols, technologies, networks, middleware, applications, systems, and data, all forming a heterogeneous network. This will increase the degree of interoperability and complexity. Because of this situation, several groups such as ITU, ETSI, and Open IoT are developing interoperability standards and IoT protocols, among others. However, the high fragmentation and development of vertical IoT systems have increased in a multi-standard context, where features, functions and devices are combined [5]. In [6] an energy and position-based IoT system are controlled in networks, which are

also based on a Smartphone and cloud computing platform. This provides energy efficiency in buildings and organizations, as a complete system on a large scale. The problem with this proposal is that it is difficult and costly to implement, so it is not recommended to be applied in ordinary smart houses. A conceptual IoT device called an AAL-IoTSys, which includes a Smart Gateway as a key component is proposed in [5]. This enables many heterogeneous devices to be interoperable across different networks, protocols and technologies eg. Wi-Fi, ZigBee, Bluetooth, IEEE 802.15.4 and 6LowPAN. Many research papers and studies in this area do not emphasize microcontroller sensor outputs for data storage and data acquisition. In this article, the resulting data collected from the device can be concurrently processed and charted synchronously with a weather station monitoring system   That is, the details can be shown and seen, directly and indirectly, in two approaches. The word 'direct' implies that the weather can be viewed directly via the NET PI network platform; whereas indirect methodology ensures that weather patterns are recorded and stored in a computer as long as the sensors calculate climatic conditions [3, 7]. The main difficulty of this research is to demonstrate and validate that microcontrollers can be connected to a data acquisition network with their sensors to build a database system based on the characteristics of the weather. The current idea helps the microcontroller sensors to predict possibilities centered on the perceived data rather than strictly tracking the device. Economically, a single sensor known as DHT sensor is used by the proposed system to provide temperature and humidity readings that were used to create the heretical framework of the climate database [2]. The articles discussing the concept of green solar systems and hybrid power plants addressed many causes that have a significant impact on appreciations of the weather conditions, such as the colour of sun rays due to environmental reactions and vibrations that alter the temperature situation and thus adjust the humidity situation proportionally [8, 9, 10]. In turn, wind speed is also another aspect that has an enormous influence on climatic conditions such as airspeed, air intensity, air direction and air coldness. The circumstances and variables suggested have a significant effect on the human being's daily weather outlook. This paper provides a simple way of remotely tracking/storing the data, that is, the consumer should install the application at a specific location and start recording and storing the data.

IMPLEMENTATION

3.1 BLOCK DIAGRAM:-

In above block diagram It consists of Rain Sensor, DHT11 Sensor, the Nodemcu and the all sensors are used to detect the Humidity, Temperature, Rainfall in each bin, and it will send this information to the Nodemcu, which acts as the system controller. In the case where the bins are already full or almost full, then it will generate a output of the BYNK app for mobile.

METHODOLOGY

IOT has become a great area of interests for institutes, big tech companies and obviously users or customers also. Many IOT based concepts have gained so much attention like Smart wearable devices, smart home, smart city etc. Almost all the applications based on Internet of things include devices like transducers and sensors attached to the microcontroller with a wireless/wired flow of data to a remote cloud service or a local data storage which converts the raw data to significant information which can further used in many areas. While working on this project we came across some works that have been accomplished in making smart applications using Nodemcu board which are economical. Most of the applications were built using these boards for example smart city and other automation projects. In [1],it was said that for a smart city "Places can be equipped with sensors and monitor environmental conditions, cyclists or athletes can find the most "healthy" trips and the city can respond by adjusting the traffic or by planting more trees in some areas. The data will be accessible to all citizens to promote the creation of applications using real-time information for residents."So we can say that this weather monitoring system will be helpful in some smart city projects also. In [2] the authors chose a single sensor ie. Composite DHT11 sensor for reading both temperature and humidity.

RESULT & CONCLUSION

Weather forecasting is the prediction of the state of the atmosphere for a given location using the application of science and technology. This includes temperature, rain, cloudiness, wind speed, and humidity. Weather warnings are a special kind of short-range forecast carried out for the protection of human life.

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