TRANSFORMER MONITORING SYSTEM USING ARDUINO

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Abstract: *Indian enterprises significantly incorporate biomedical, horticultural and pharmaceutical which are the mainstays of nation economy. The checking of temperature and humidity are significant regions for every one of these enterprises. Any sort of unbalancing in the ecological conditions or disconnected parameters can make budgetary misfortune in the profitability of pharmaceutical and horticulture enterprises. Checking of temperature and moistness are likewise required for biomedical industry for medications and cell culture strategies. In medicinal services segments, condition controlled, conditions are additionally required for patients undermining. In this paper we are going to gauge temperature and humidity by utilizing Node MCU apparatus and DHT11, which will be useful for adjusting the earth to build the productivity in this in agriculture sector today's weather forecasting systems accessible based on satellite and RADAR communication. These frameworks are substantial, hard to deal with and exorbitant. They are detecting scarcely specific region and its incomplete range. In any case, in horticulture field universally not indistinguishable ecological conditions it is important to observing every single yield existing natural situation. An agriculture field premises has dissimilar humidity, temperature, moisture, light intensity because corner of plot trees and water leakage, so that kind of changes across all parameters of field are essential, and such parameters of yield continue the quality. In present paper proposed framework, enhancement of moistness and temperature. There are numerous frameworks are accessible in the market dependent on Wireless sensor organize (WSN) yet this framework is more vitality effective, little size, convenient. Sensor is coordinated bundle contains stickiness and temperature estimation ability in single bundle.*

Keyword: Arduino UNO, Temperature sensor, oil level sensor, current sensor, voltage sensor, Wi-Fi model, android

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I INTRODUCTION

Transformer monitoring system is basically used where monitoring of a transformer is pretty difficult. Major problems are the weather conditions such as rainy conditions or sunny weather which affects the transformer in different ways. Parameters which we are going to measure are Temperature, Oil, Current, and Voltage. The project is divided into three parts POWER ELECTRONICS, ELECTRONICS, IoT, Electricity has several components and equipment helping human to transfer and regulate the distribution according to usage. The most crucial equipment of transmission and distribution of electric power is transformer. In Power system, an electrical component transformer directly distributes power to the low-voltage users and its operation condition is a criteria of the entire network operation. The majority of the devices have been in service for many years in different (electrical, mechanical, environmental) conditions. They are the main components and constitute the large portion of capital investment. Operation of distribution transformer under rated condition (as per specification in their name plate) guarantees their long service life. However their life is significantly reduced if they are subjected to overloading, heating low or high voltage current resulting in unexpected failure and loss of supply to a large number of customers thus is effecting system reliability.

Overloading, oil temperature load current and ineffective cooling of transformer are the major cause of failure in distribution transformer. As a large number of transformers are distributed over a wide area in present electric systems, it's difficult to measure the condition manually of every single transformer. So we need a distribution transformer system to monitor all essential parameters operation, and send it to the monitoring system in time. It provides the necessary information about the health of the transformer.

This will help and guide the utilities to optimally use the transformer and keep this equipment in operation for a longer period

II LITERATURE SURVEY

1. Name of paper- REMOTE TEMPERATURE MONITORING AND CONTROL USING IoT. Publisher – IEEE Author- V. Ramesh, M. Sankaramahalingam, Divya Bharathy M S , Aksha R Year - March 2017 Objective - A checking framework for the most part alludes to a robotized framework that at the same time and persistently records at least one physical parameters, for example, temperature, relative moistness, windstream, light power, soil dampness and so forth at least one predefined places. Limitation: the system use to record the parameter value to detect defect 2.Name of paper- "Remote Temperature Monitoring

Using LM35 sensor and Intimate Android user via C2DM

Service"Publisher – IJCSMC Author- Poonam, Prof. (Dr.) Yusuf Mulge Year - 2016 Objective - The application server which analyzes the temperature data, then informs a registered user for taking proper action in case of fire. This work aims at monitoring remote room temperature. Thus provides an opportunity to quickly respond to fire emergencies.

Limitation: internet connectivity is required.

A checking framework for the most part alludes to a robotized framework that at the same time and persistently records at least one physical parameters, for example, temperature, relative moistness, windstream, light power, soil dampness and so forth at least one predefined places.The application server which analyzes the temperature data, then inform a registered user for taking proper action in case of fire. This work aims at monitoring of remote room temperature. Thus provides opportunity to quickly respond to fire emergencies.Power transformers, which perform the function of transforming the voltage levels, are one of the most important electrical equipment that are used in power transmission systems. Hence, it is mandatory to perform power transformer maintenance; as they are normally scattered geographically, it is impractical to do periodical monitoring due to insufficient manpower. As the reason above, transformer failure may occur which causes the transformer from network unexpectedly power shutdown. To overcome this shutdown from transformer failure of the adapter, a system for transformer monitoring

and self-protection was proposed in case the maintenance is delayed. In this paper, the temperature and humidity within the transformer were monitored, in addition to monitoring the rate of loading on the transformer. By using the internet of things (IoT), a self-protection system is designed and implemented for the transformer.
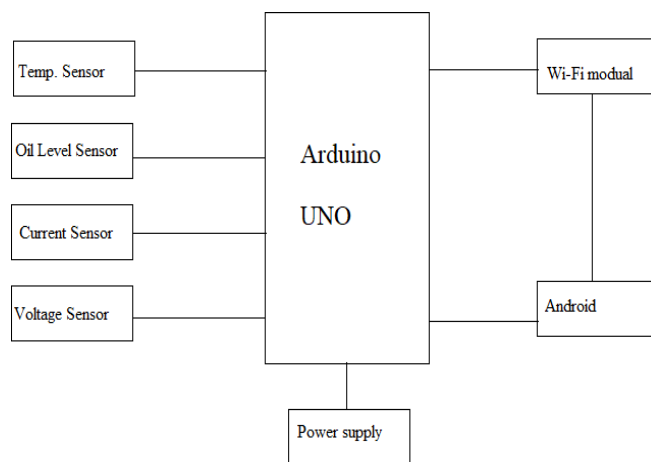
III METHODOLOGY

Fig.1 Block Diagram of the System and Its Explanation

The Arduino UNO consists of a sensing unit which collects the data from parameters such as current, voltage and the oil temperature of the transformer. The android application connected to the processing unit via Wi-Fi module, which displays corresponding parameter values at the substation for any technical operations. The controller also senses the over load and high current flow , temperature and oil level that may lead to breakdown of the corresponding unit.The Arduino controller is programmed in such a manner so as to continuously scan the transformer and update the parameters at a particular time interval.

In the given circuit diagram we have used the 5Vregulated power supply, sensing elements, display unit and IOT module.

Step 1: Verification and validation of Problem statement and finding practical scope of the project.

Step 2: plotting down the observation and approaching the literature survey of the project, referring to various eBooks, journal papers, technical articles, videos and Books.

Step 3: Based on the literature survey finalizing the components. Preparing virtual circuit design and simulating

it to find the errors, and replace any component is found dysfunction.

Step 4: Once the expected result is obtained, the circuit diagram is finalized and components are purchased. The PCB design is then traced using Dip Trace software.

Step 5: The PCB is then developed and the components are mounted, the peripherals are then connected to the circuit and the circuit is ready for Implementation.

Step 6: The system is then mounted on a board.

Step 7: The power supply is connected and the system is ready to use. It is tested on several parameters and then made for the public to use.

IV FUTURE SCOPE

All the utilities are quite troubled just because of the huge rate of failure of distribution transformers. The rate of failure transformers in our country is around 12 to 15 % which is quite higher in comparison to other developed nation which is even less than 1%.In future, if this system will be implemented by the power utilities of our country, a huge amount of money can be saved which is spent on the repair of transformers. This money can be utilized for the development and growth of our nation that helps it to become strong and also to the sustain that development.

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