IOT BASED POWER THEFT DETECTION AND TRANSFORMER SAFETY

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College ***:*** *Bangalore Institute of Technology, Bengaluru*
Branch ***:*** *Department of Telecommunication Engineering*
Guide(s) ***:*** *Mr. Girish Kumar N G*
Student(s) ***:*** *Mr. Taqi Ahmed Khatib*
Mr. Yogesh R Gowda
Mr. Anirudh R
Mr. Akumalla Nayan Aahladh

Introduction:

In this project a prototype is developed which is capable enough to detect the power theft, monitor the oil level and detects the dynamic variations of the temperature and alerts (voice announcement and txt message) the BESCOM officials wherever the power theft takes place or if there are any irregularities in the transformer. Project provides a complete and comprehensive tool to prevent power theft which is very simple to understand and easy to implement. When it comes to the transformer safety, monitoring of all of the transformer's main performance influencing characteristics. Any deviation from its usual value signals a fault condition that requires immediate care to avoid all types of defects and catastrophic failures.

Objectives:

1. The problem definition of our system which is useful for the government in order to monitor the transmission system and get the required electricity.
2. The major objective of the project is to control/prevent the theft of electricity.
3. By implementing this system, it diminishes the revenue losses faced by the government by investing in extra man power (vigilance department, BBMP).
4. Another objective is to safeguard and maintain transformers for its effective, efficient and long-term usage/productivity.
5. Therefore, the project can be considered as a revenue generating element.

Methodology:

Components Used:

NodeMCU esp32 Microcontroller, MCT2E Optocoupler, Rogoswki Coil Current Sensor, LM35 Temperature Sensor, Oil Level Sensor, PIR Sensor, Smartphone, LCD Display.

Here a 200W bulb will represent the extra load used to represent the power theft and a 60W bulb for normal state. Current sensor will sense the amount of flow of current, the current pulses and the other output of the optocoupler will be given to a 5V microcontroller. Hence, the power theft detection will take place depending upon the rate at which the current pulses are counted and that intern will get displayed on the LCD as “Power Theft” and simultaneously the alert message will be sent to the BESCOM officials through the GSM and voice announcement. Temperature sensor and the oil level detection sensors are used to indicate the low oil level and high temperature then that information will get displayed on LCD and then the respective message will be sent to the BESCOM officials. In-order to provide the proof for the power theft taking place the intruder sensor is used and it will be displayed on the LCD along with the location of theft taking place.

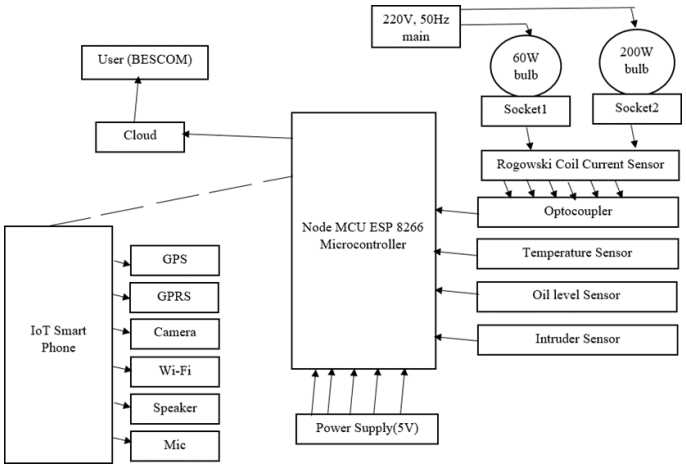

Fig. 1. Block Diagram

RESULT and CONCLUSION:

The model implemented is a cost effective and efficient IOT model for power theft prevention and transformer safety. It is considered as a revenue generating element. The microcontroller-based system has successfully interfaced with a variety of sensors. Applications named “Guardian and IOT” are used for tracking (location), auto complaint (voice and message alert), monitoring and detecting with visual proof (images).

Future Scope:

Here a smartphone is being used for capturing and sending the photo of the intruder, sending the location of the transformer and also sending alert messages regarding the transformer to the user. The smartphone can be replaced with an actual camera for capturing the photos of the intruder and a GPS tracker can be installed for sending the location of the transformer to the user.