

# **IOT BASED TRANSFORMER HEALTH MONITORING SYSTEM**

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# INTRODUCTION

- When we look at our daily routine we can say that electricity is a major part of our life and transformers plays the role of electricity carrier to us from stations.
- Transformer plays a vital role in the electricity distribution system. Maintaining a transformer and controlling it is very risky.
- If the demand for power is very high, Transformers get overloaded due to the use of electricity.
- Overloading affects the efficiency of the transformer and gives a drawback in electricity distribution system.
- It is mandatory to avoid problems in the transformer due to overloading.

# **ABSTRACT**

**Transformers are the main building block in a power system. Any damages in transformers adversely affects the balance of a power system. The damages are mainly occurring due to overloading and inefficient cooling. The main objective of the is real time monitoring of the health conditions of the distribution transformer using IOT technology. The parameters such as temperature, voltage and current of a transformer are monitored, processed and recorded in servers. For this purpose, we use three sensors interfaced with pic microcontroller 18F452. The recorded data can be send using Wi-Fi module and accessed from anywhere around the world using IOT technology using HTTP protocol. This helps in identifying without human dependency.**

# OBJECTIVES

- To design a system that uses temperature, voltage, and current sensors to monitor the defined parameters of the transformers.
- To develop programmable codes and implement them in the hardware of the transformer condition monitoring system using Microcontroller PIC 18F452 and sensors.
- To ensure that all analog signals are converted to digital signals by the ADC to enable the microcontroller to understand it.
- The parameters recorded from the sensors will be sent over the internet through the WI-FI Module to constantly inform the engineers when a threshold of a set parameter is exceeded.

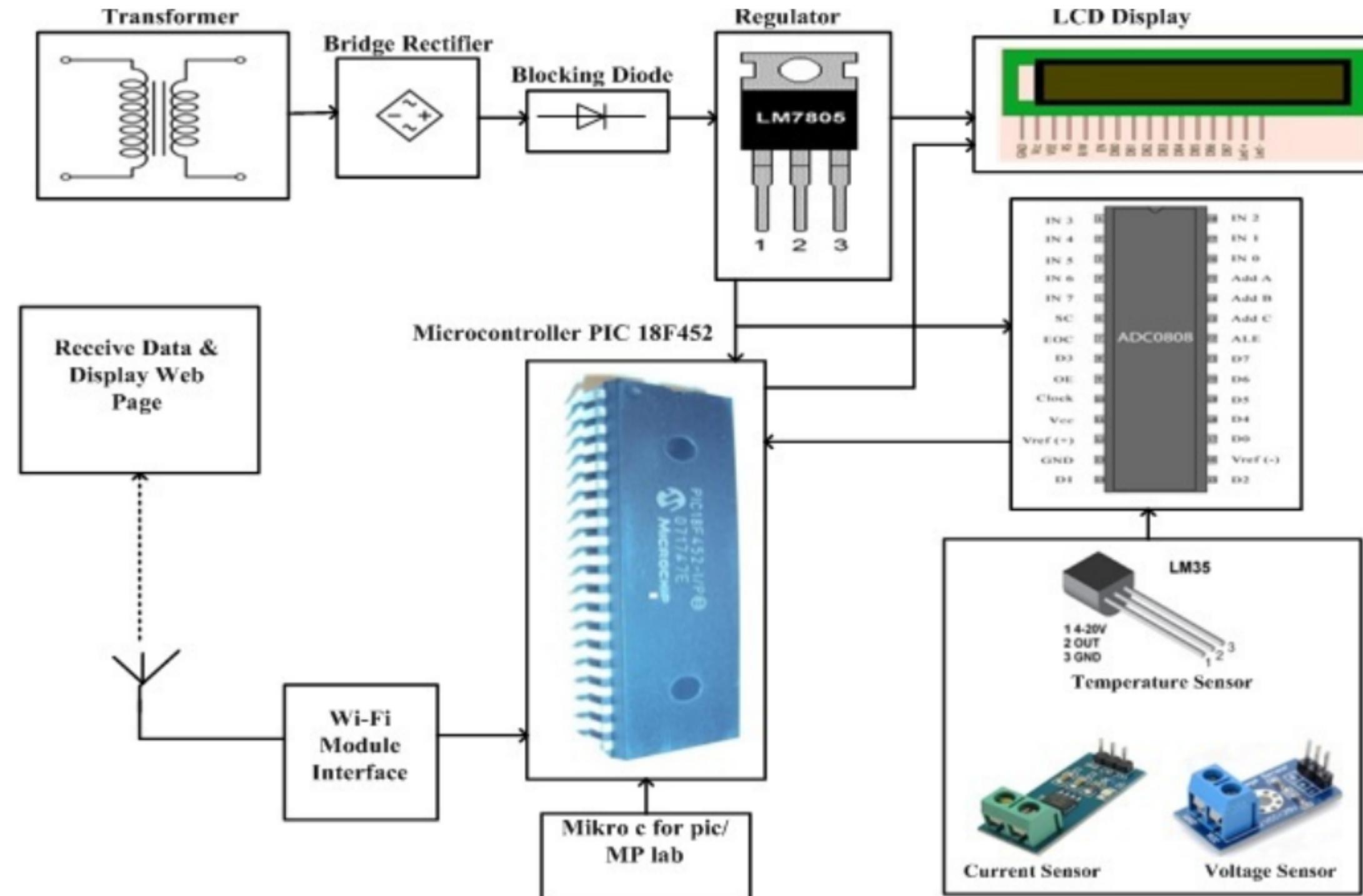
# **COMPONENTS USED**

- Transformer
- Bridge Rectifier
- Blocking diode
- LCD Display
- Microcontroller PIC 18F452
- Voltage, Current and Temperature Sensors
- ADC 08080

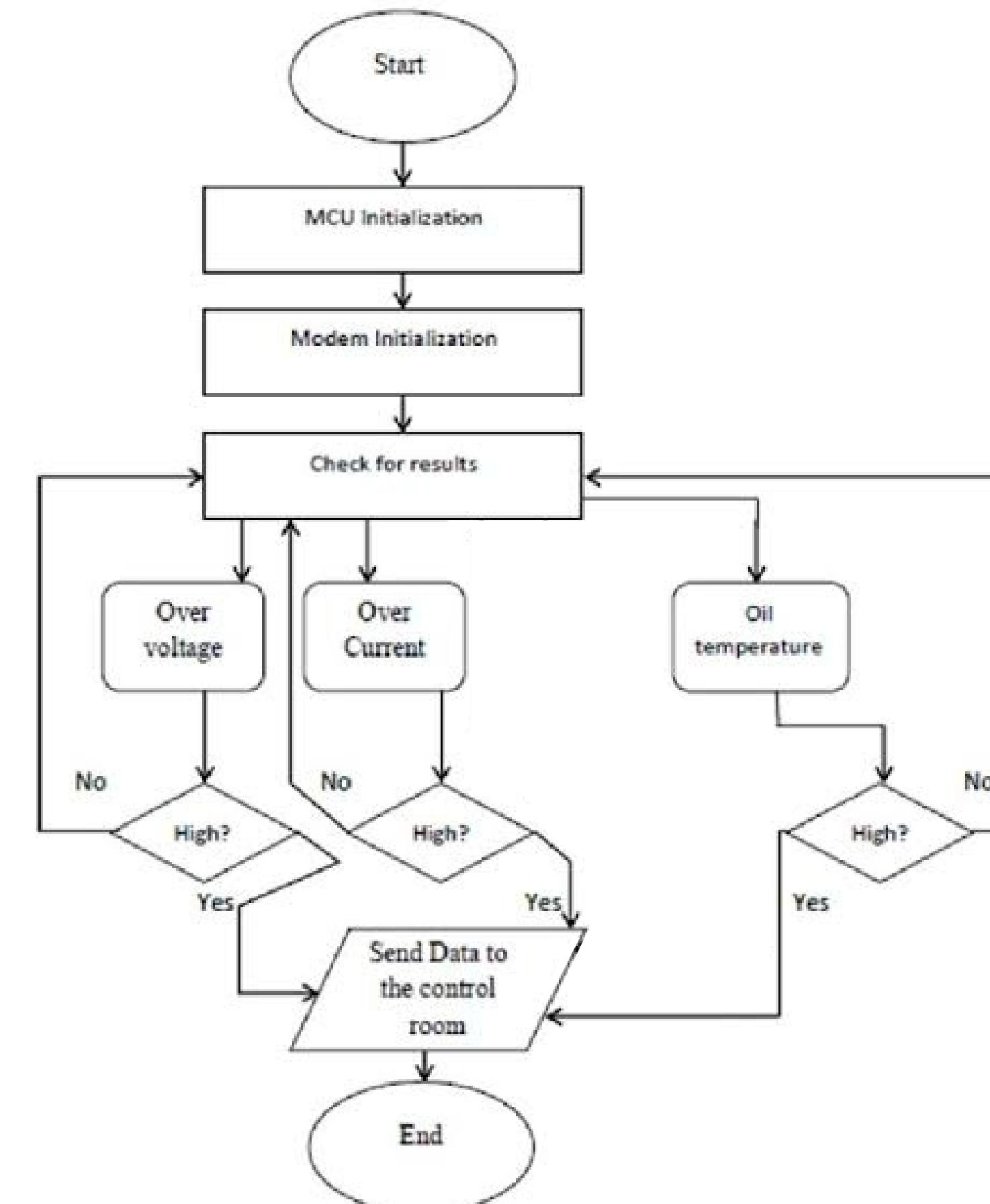
# METHODOLOGY

- Entire block is divided into three parts. These are data collection, data processing, communication .
- Fig shows block diagram of IOT based transformer health monitoring system.

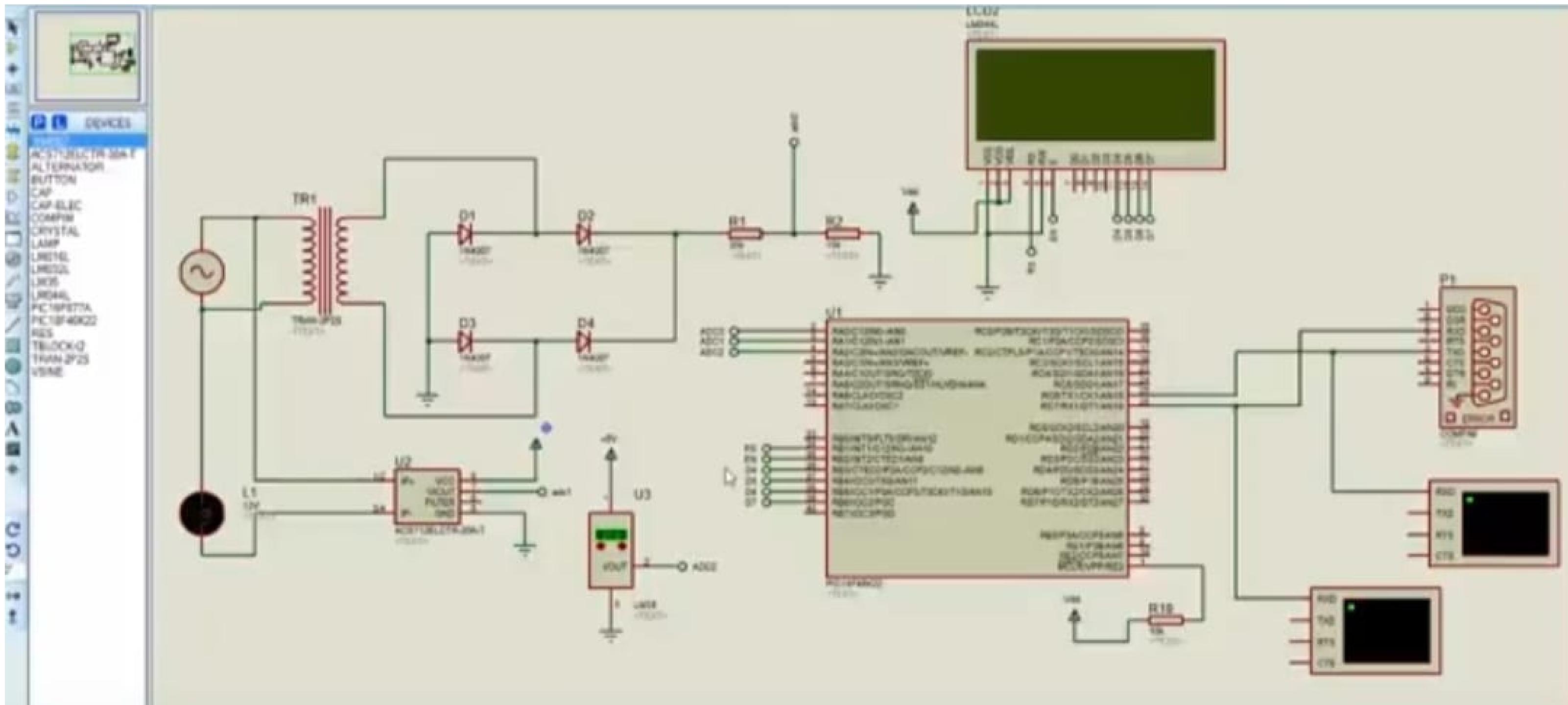
# BLOCK DIAGRAM



# FLOW CHART



# Simulation



# **ADVANTAGES**

- This system could be used for real-time data monitoring of industrial and domestic loads.
- By using this system, the user or supply company can easily check the instant temperature, current, or voltage of the transformer or generator. If they increased their rated parameters, the user can shift the load to another supply source before something occurred.
- This system is more reliable, cheap, and compact compared to the other systems.

# REFERENCE

- Pawar, D. S., (2017). "Health condition monitoring System for Distribution Transformers". International conference on computing methodologies and communications.
- C. Bethalsha., (2020) "Real-Time Transformer Health Monitoring using IOT" International Journal for Research in Applied Science & Engineering Technology (IJRASET).
- Anthony Kwarteng., (2021)" Design and Construction of an IoT Based Distribution Transformer Condition Monitoring System"(IJES) vol-10.

**THANK YOU**

# METHODOLOGY

The components of the block diagram measures various real time parameters associated with the distribution transformer. The information definitely assures the proper health monitoring of commercial transformers. Three sensors such as voltage sensor, temperature sensor and current sensor were involved. A power supply is used to operate microcontroller PIC18F452 . Once the data's are sensed that can be read from the LCD display and send this data to the Wi-Fi module. Then the Wi-Fi module which is interfaced with wireless network and by using wireless network we can see this data at our computer or laptop through any dedicated IP (internet protocol) address. This data is displayed at dedicated website in three different charts such as current, voltage and temperature charts.