

# Proposed Solution

## *Electric Motor Temperature Prediction using Machine Learning*

### 1. Solution Overview

The proposed solution aims to develop a Machine Learning-based predictive system that estimates the temperature of an electric motor using operational parameters. The system will help in predictive maintenance, preventing overheating, and improving motor efficiency.

### 2. Data Collection

- Collect sensor data such as voltage, current, torque, speed, and ambient temperature.
- Gather historical temperature readings.
- Store collected data in a structured dataset.

### 3. Data Preprocessing

- Handle missing or inconsistent values.
- Normalize or scale numerical features.
- Split dataset into training and testing sets.
- Perform feature engineering if required.

### 4. Model Development

- Apply regression algorithms such as Linear Regression and Random Forest.
- Train models using training dataset.
- Validate performance using cross-validation techniques.
- Select the best-performing model based on evaluation metrics.

### 5. Model Evaluation

- Evaluate using MAE (Mean Absolute Error).
- Evaluate using MSE (Mean Squared Error).
- Evaluate using RMSE (Root Mean Squared Error).
- Evaluate using R-squared score.

## **6. Deployment Strategy**

- Deploy the trained model using Flask or FastAPI.
- Develop a simple web interface for user input.
- Enable real-time temperature prediction.
- Monitor system performance and update model periodically.

## **7. Expected Outcome**

The system will accurately predict electric motor temperature, reduce unexpected failures, support predictive maintenance, and improve operational safety and efficiency.