Project Design Phase
Problem – Solution Fit Template

Date	19 February 2026
Team ID	LTVIP2026TMIDS61980
Project Name	Electric Motor Temperature Prediction System
Maximum Marks	2 Marks

Problem – Solution Fit Template:

The Problem–Solution Fit ensures that the proposed system solves a real industrial problem by understanding user needs, operational challenges, and behavioral patterns. The Electric Motor Temperature Prediction System focuses on preventing motor failures through predictive analytics and intelligent monitoring.

Purpose:

❑ Reduce unexpected motor failures in industries
❑ Enable predictive maintenance instead of reactive maintenance
❑ Improve operational efficiency and equipment lifespan
❑ Provide early temperature prediction using machine learning
❑ Support data-driven decision-making for maintenance teams

Template:

Customer Discovery Sheet – Electric Motor Temperature Prediction System

1. CUSTOMER SEGMENT(S)

Who is your customer?

- Industrial Plant Operators
- Maintenance Engineers
- Manufacturing Unit Managers
- Electrical Engineers

2. JOBS-TO-BE-DONE / PROBLEMS

Which problems does your system address?

- Sudden overheating of electric motors
- Unexpected equipment breakdowns
- Lack of early warning systems
- Manual monitoring of motor temperature
- High maintenance and repair costs
- Inefficient preventive maintenance planning

3. TRIGGERS

What motivates them to act?

- Frequent motor failures
- Production downtime losses
- Increased repair expenses
- Need for predictive maintenance solutions
- Requirement for efficient energy utilization

4. EMOTIONS: BEFORE / AFTER

Before:

- Worried about sudden machine failures
- Reactive maintenance approach
- Lack of confidence in manual monitoring
- Stress due to unexpected downtime

After:

- Confident with early temperature prediction
- Reduced maintenance stress
- Improved operational reliability
- Better planning of maintenance schedules

5. AVAILABLE SOLUTIONS

What exists today?

• Threshold-based alarm systems
• Manual temperature monitoring
• Periodic maintenance inspections
• Basic sensor monitoring without prediction capability

6. CUSTOMER CONSTRAINTS

What stops them from acting?

• High cost of advanced monitoring systems
• Limited AI adoption in traditional industries
• Lack of technical expertise
• Integration challenges with existing systems
• Resistance to technology transition

7. BEHAVIOUR

What do users do today to solve these problems?

• Monitor temperature manually at intervals
• Use fixed temperature alarms
• Perform maintenance only after failure occurs
• Depend on technician experience for decisions

8. CHANNELS OF BEHAVIOUR

8.1 ONLINE:

• Web-based prediction system (Flask application)
• Machine learning prediction dashboard
• Sensor data analysis tools

8.2 OFFLINE:

• Manual inspection of motors
• Scheduled maintenance logs
• Physical monitoring instruments

9. PROBLEM ROOT CAUSE

Why does the problem exist?

• Lack of predictive analytics in monitoring systems
• Dependence on threshold-based alerts
• Insufficient analysis of historical sensor data
• Absence of intelligent maintenance tools.

10. YOUR SOLUTION

What do you offer?

A Machine Learning–based Electric Motor Temperature Prediction System featuring:

- Data preprocessing and feature scaling using MinMaxScaler
- Regression models (Linear Regression, Decision Tree, Random Forest, SVR)
- Decision Tree model for accurate temperature prediction
- Flask-based web application for user interaction
- Real-time temperature prediction using input parameters
- Visualization and performance evaluation using RMSE and R^2 score
- Future-ready architecture for IoT sensor integration and automated alert.