# Project Initialization and Planning Phase

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| Date | 15 March 2024 |
| Team ID | SWTID1720078183 |
| Project Title | Predictive Modeling For Fleet Fuel Management Using Machine Learning |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution)**

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

| **Project Overview** | |
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| Objective | The primary objective of this project is to build a machine learning algorithm to predict the fuel consumption of fleet vehicles based on gas type. This model will be integrated into a web application to enhance fuel economy and prevent fraudulent activities in fleet management. |
| Scope | The project involves the development of a machine learning model and its integration into a web application. The model will predict fuel consumption based on measurable factors such as gas type. The web application will provide a user-friendly interface for fleet managers to utilize these predictions for better fuel management. |
| **Problem Statement** | |
| Description | The ability to model and predict fuel consumption is vital for enhancing the fuel economy of vehicles and preventing fraudulent activities in fleet management. Fuel consumption depends on several internal and external factors, but not all these factors may be measured or available for analysis. |
| Impact | Solving this problem will enable fleet managers to optimize fuel consumption, reduce costs, and prevent fraud. This will lead to more efficient fleet operations and significant cost savings. |

| **Proposed Solution** | |
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| Approach | The solution involves developing a machine learning algorithm that predicts fuel consumption based on gas type and other measurable factors. The methodology includes data collection, preprocessing, model training, validation, and deployment. The trained model will be integrated into a web application, providing an intuitive interface for fleet managers to access predictions and insights. |
| Key Features | • Accurate Predictions: Utilizes machine learning to provide reliable fuel consumption predictions.<br>• Web Integration: A web application that allows easy access and interaction with the model.<br>• Real-time Analysis: Provides real-time fuel consumption analysis based on various inputs.<br>• User-friendly Interface: Designed for easy use by fleet managers with minimal technical expertise. |

**Resource Requirements**

| **Resource Type** | **Description** | **Specification/Allocation** |
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| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | e.g., 2 x NVIDIA V100 GPUs |
| Memory | RAM specifications | e.g., 8 GB |
| Storage | Disk space for data, models, and logs | e.g., 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | e.g., Flask |
| Libraries | Additional libraries | e.g., scikit-learn, pandas, numpy |
| Development Environment | IDE, version control | e.g., Jupyter Notebook, Git |
| **Data** | | |
| Data | Source, size, format | e.g., Kaggle dataset, 10,000 |

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