Project Design Phase-II

Technology Stack (Architecture & Stack)

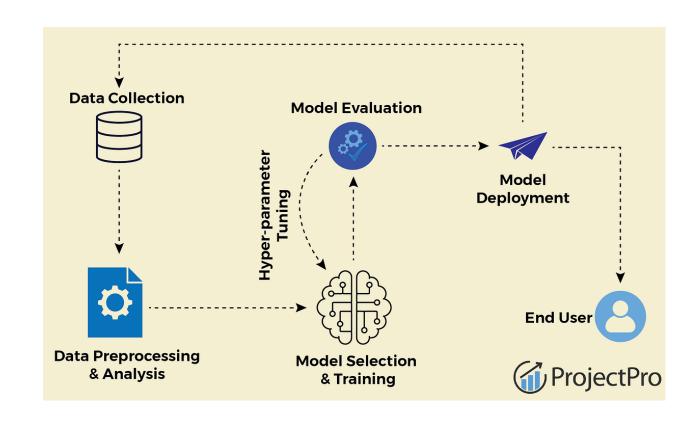| Date	2 November 2023
Team ID	Team-591756
Project Name	ECOMMERCE SHIPPING PREDICTION USING MACHINE LEARNING
Maximum Marks	4 Marks

Technical Architecture:

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Data Collection	Collecting historical shipping data including features like product details, customer location, time of year, etc.	Ecommerce platforms, Web scraping tools, APIs.
2.	Data Preprocessing	Cleaning and transforming raw data is crucial for machine learning models	Python libraries like Pandas and NumPy for data manipulation, Scikit-Learn for preprocessing.
3.	Feature Engineering	Creating new features from the raw data to help improve the performance of the machine learning model	Domain knowledge, Python, Pandas.
4.	Machine Learning Model	Training a machine learning model to predict shipping time based on the processed features.	Scikit-Learn, XGBoost, LightGBM, TensorFlow, PyTorch.
5.	Model Evaluation	Evaluating the performance of the model using appropriate metrics.	Scikit-Learn's metrics module for Mean Absolute Error, Root Mean Squared Error etc
6.	Hyperparameter Tuning	Optimizing the parameters of the machine learning algorithm to improve performance.	GridSearchCV or RandomizedSearchCV in Scikit-Learn
7.	Model Deployment	Deploying the trained model for making predictions in real-time	Flask for creating APIs, Cloud platforms (e.g., AWS, Azure, GCP).
8.	User Interface	Creating a user-friendly interface for users to interact with the shipping prediction system.		Web development (HTML, CSS, JavaScript), mobile app development (e.g., React Native, Flutter)
9.	Continuous Improvement	Regularly update and improve the system by collecting user feedback and enhancing the model.	Agile development practices, version control (e.g., Git).

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Data Preprocessing	Cleaning and transforming raw data is crucial for machine learning models.	Python libraries like Pandas and NumPy for data manipulation, Scikit-Learn for preprocessing.
2.	Machine Learning Algorithms	Choosing the right algorithm for prediction.	Scikit-Learn for traditional machine learning algorithms, XGBoost or LightGBM for gradient boosting.

3.	Model Evaluation		Evaluating the performance of the model	Use Scikit-Learn's metrics module for accuracy, precision, recall etc.
4.	Feature Selection	Dentifying the most relevant features for the prediction.	Techniques like correlation matrices, Recursive Feature Elimination
5.	Hyperparameter Tuning	Optimizing the parameters of the machine learning algorithm to improve performance.	Optimizing the parameters of the machine learning algorithm to improve performance.