Project Initialization and Planning Phase

Date	10 JUNE 2024
Team ID	740094
Project Title	Human Resource Management :Predicting Employee Promotions Using Ml
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

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	
Objective	To develop a machine learning model that predicts employee promotions accurately and fairly, assisting HR departments in making data-driven promotion decisions.
Scope	The project will focus on analyzing historical employee data, including performance metrics, training records, tenure, and feedback scores, to build a predictive model. The scope includes data preprocessing, feature engineering, model development, evaluation, and integration with existing HR systems.
Problem Statement	

Description	The current promotion process is often subjective and prone to biases, leading to potential dissatisfaction and decreased employee morale. There is a need for an objective, data-driven approach to identify deserving candidates for promotions.
Proposed Solution	
Approach	-*Data Collection and Preprocessing:* Gather historical data on employee performance, demographics, training, etc., and preprocess it to handle missing values and outliers. - *Feature Engineering:* Create relevant features that capture key aspects influencing promotions. - *Model Development:* Use various machine learning algorithms (e.g., Random Forest, Gradient Boosting) to build and train predictive models. - *Evaluation and Tuning:* Evaluate models using metrics like accuracy, precision, recall, and AUC-ROC. Perform hyperparameter tuning for optimization. - *Deployment:* Integrate the model into the HR system for real-time promotion recommendations.
Key Features	-*Bias Mitigation:* Techniques to detect and mitigate biases in the model, ensuring fairness. - *Explainability:* Using SHAP values to provide transparency into how the model makes decisions. - *Real-Time Analytics:* Continuous learning from new data to adapt to changing workforce dynamics. - *User-Friendly Interface:* A dashboard for HR managers to visualize predictions and insights.

Resource Type	Description	Specification/Allocation
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

Resource Requirements

Development Environment	IDE, version control	e.g., Jupyter Notebook, Git
Data		
Data	Source, size, format	e.g., Kaggle dataset, 10,000 images