

Strategic PACE Roadmap: Salifort Motors Analysis

Stage 1: Plan (P)

Building the Foundation and Alignment

Task	Strategic Reasoning
Stakeholder Discovery	To ensure the model solves a business problem (attrition) rather than just being a mathematical exercise.
Ethical Risk Assessment	Employee data is sensitive. We must decide how to handle features like "salary" or "tenure" to avoid biased predictions or invasive monitoring.
Project Scoping	Deciding between a Regression (for interpretability) or Tree-based model (for accuracy) based on whether leadership wants to know <i>why</i> people leave or <i>who</i> will leave.

Stage 2: Analyze (A)

Transforming Raw Data into Evidence

Task	Strategic Reasoning
Data Scrubbing	Handling the ~3,000 duplicate rows identified in the dataset. Uncleaned data leads to "leakage," where the model memorizes data rather than learning patterns.

Exploratory Data Analysis (EDA)	Using boxplots to compare "Average Monthly Hours" against "Left." This visually proves to stakeholders if burnout is a statistically significant factor before we even build a model.
Variable Encoding	Converting categorical data (Department, Salary) into numerical formats (One-Hot Encoding) so the machine learning algorithms can process them.

Stage 3: Construct (C)

Building the Predictive Engine

Task	Strategic Reasoning
Model Selection (Random Forest)	Choosing a tree-based model because HR data often has non-linear relationships (e.g., people leave if they work too little <i>or</i> too much).
Hyperparameter Tuning	Adjusting "max_depth" and "n_estimators" to prevent overfitting , ensuring the model works on future employees, not just the current dataset.
Feature Importance Ranking	Extracting which variables move the needle most. This creates the "Feature Importance" chart that will be the centerpiece of the final presentation.

Stage 4: Execute (E)

Communicating Value and Recommendations

Task	Strategic Reasoning
Model Evaluation (Recall/F1-Score)	In retention, a False Negative (missing someone who is about to quit) is more expensive than a False Positive . We optimize for "Recall" to catch at-risk talent.
Synthesis of Insights	Translating technical metrics into business advice (e.g., "Employees with 6+ projects have a 70% higher turnover rate; recommend a 5-project cap").
Final Documentation	Summarizing the PACE journey in an Executive Summary to prove the project's ROI (Return on Investment) to Salifort Motors leadership.