Employee Attrition Prediction Project

Salifort Motors

ISSUE / PROBLEM

The company sought to understand why employees leave and predict who is at risk by uncovering the key factors behind attrition.

Gaining these insights will enable HR to take proactive steps to strengthen employee satisfaction and retention.

RESPONSE

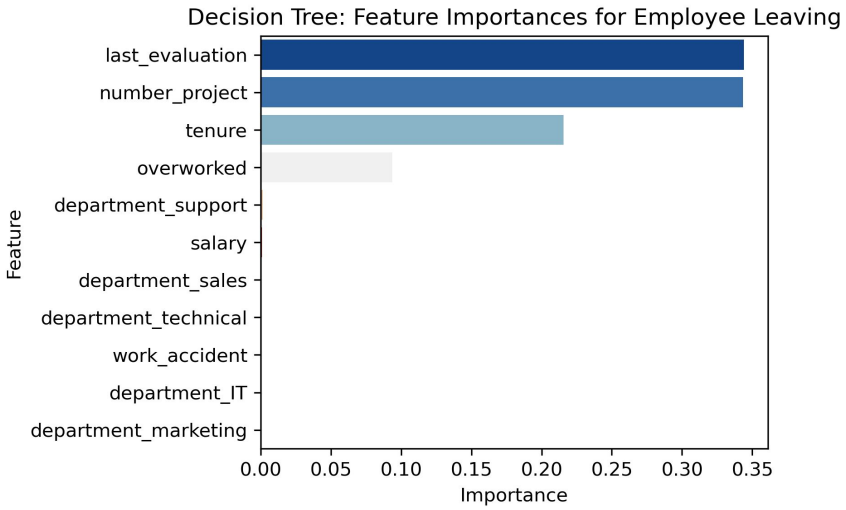
Since the target variable 'left' was categorical, classification models were applied for prediction. Logistic regression was used as a simple, interpretable baseline, while tree-based ML models were tested to capture more complex patterns in the data.

Among them, random forest model outperformed a single decision tree, making it the most effective for predicting attrition.

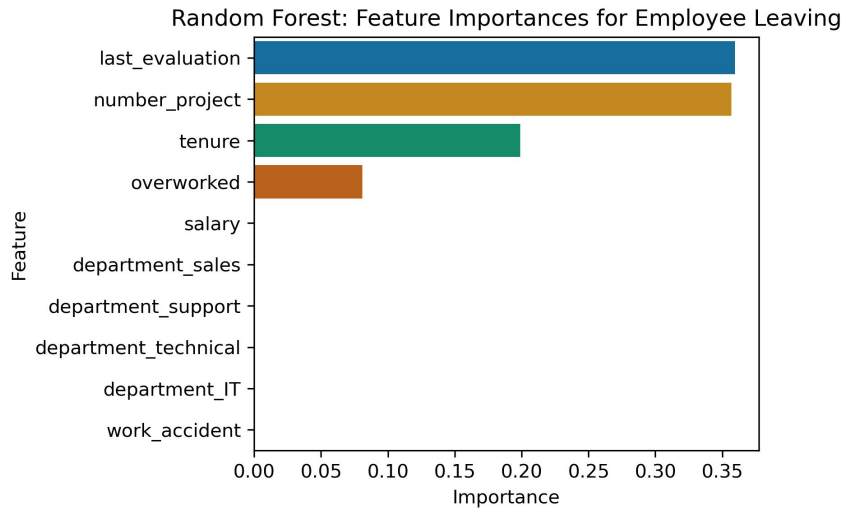
IMPACT

The predictions support strategic workforce planning by helping the company allocate resources more efficiently and reduce hiring costs.

They also provide early warning signals that allow HR to intervene before attrition risks escalate.



Decision Tree model plot highlighted the most influential variables: *'last_evaluation', 'number_project', 'tenure', 'overworked',* and demonstrated strong performance (Accuracy & ROC-AUC: 95.9%)



Random Forest model plot revealed similar key variables crucial in predicting the outcome variable, *'left'* and *modestly outperformed the Decision Tree with higher performance* (Accuracy 96.2%, ROC-AUC 93.8%)

KEY INSIGHTS

- Limit simultaneous projects per employee to reduce burnout.
- Recognize long hours and overtime through pay, bonuses, or time off, or reduce reliance on overtime where possible.
- Provide promotion pathways, recognition, and growth opportunities, focusing on employees with 4+ years of service, and investigating the root causes of dissatisfaction at this particular tenure milestone.
- Communicate clearly on overtime pay, workload expectations, and time-off policies.
- Redesign performance criteria to reward quality, innovation, and sustainable results, rather than extreme working hours (200+ hours per month).
- Foster open dialogue through forums to address concerns on workload, fairness, and recognition.

Next steps: Test feature sensitivity and apply ML models like K-means clustering to uncover distinct employee groups for targeted retention. Implement dashboards to track workload, satisfaction, and evaluations for proactive HR interventions.