

PREDICTING EMPLOYEE ATTRITION

PART 02



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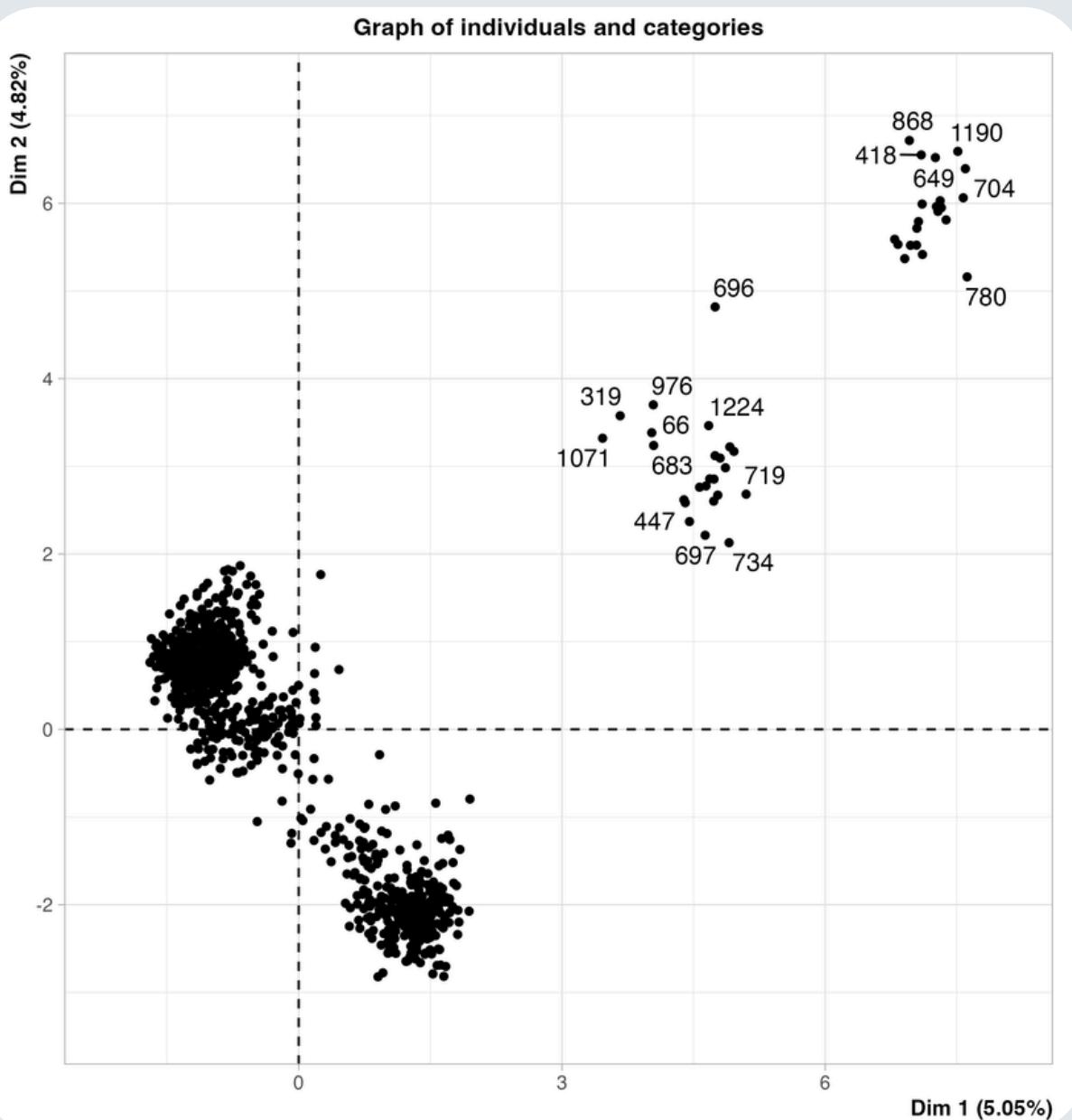
Liceria & Co.

MODEL BUILDING

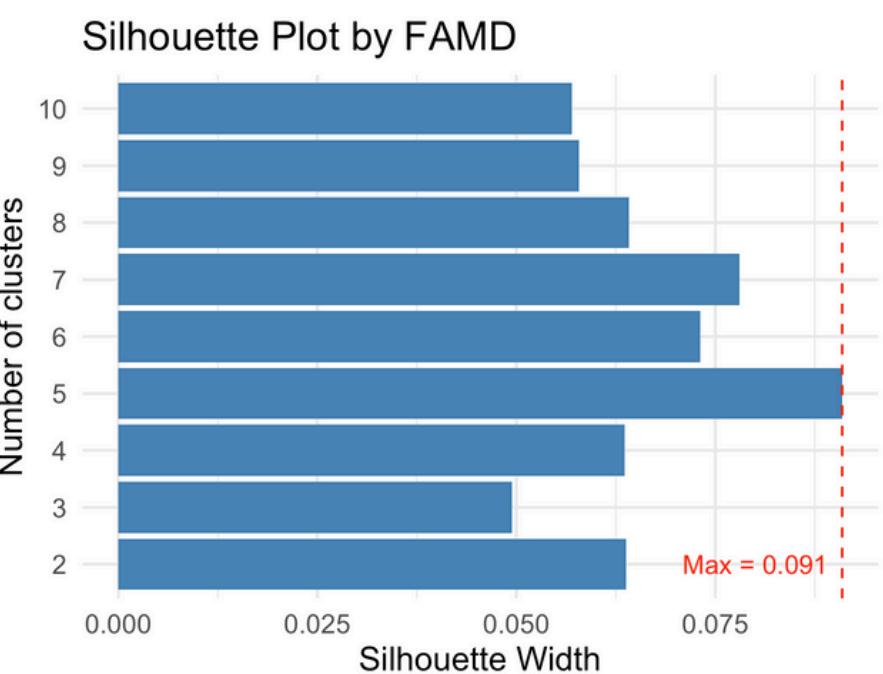


FACTOR ANALYSIS FOR MIXED DATA

Clusters are visible by the first component but, explains less than 10% of the variation



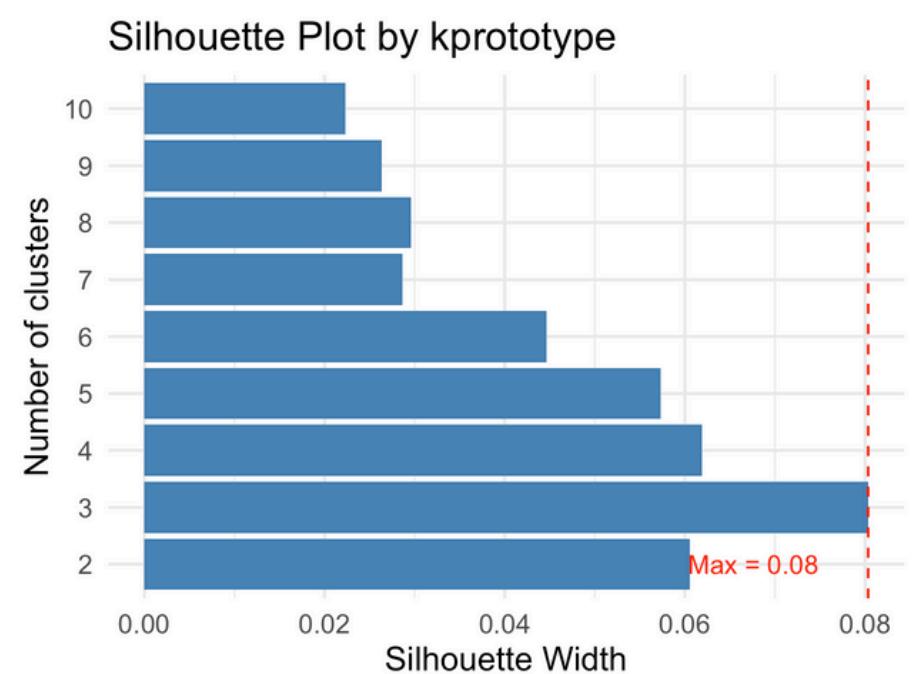
Get components that explain 70% of the variation



All the provided silhouette scores are **very close to 0**

K means Clustering ↗ ↘ No Significant Clusters

kprototype clustering for original data



All the provided silhouette scores are **very close to 0**

Kprototype Clustering ↗ ↘ No Significant Clusters

Presence of Multi-collinearity

Categorical vs Categorical
Pearson's chi-square test
Cramer's V

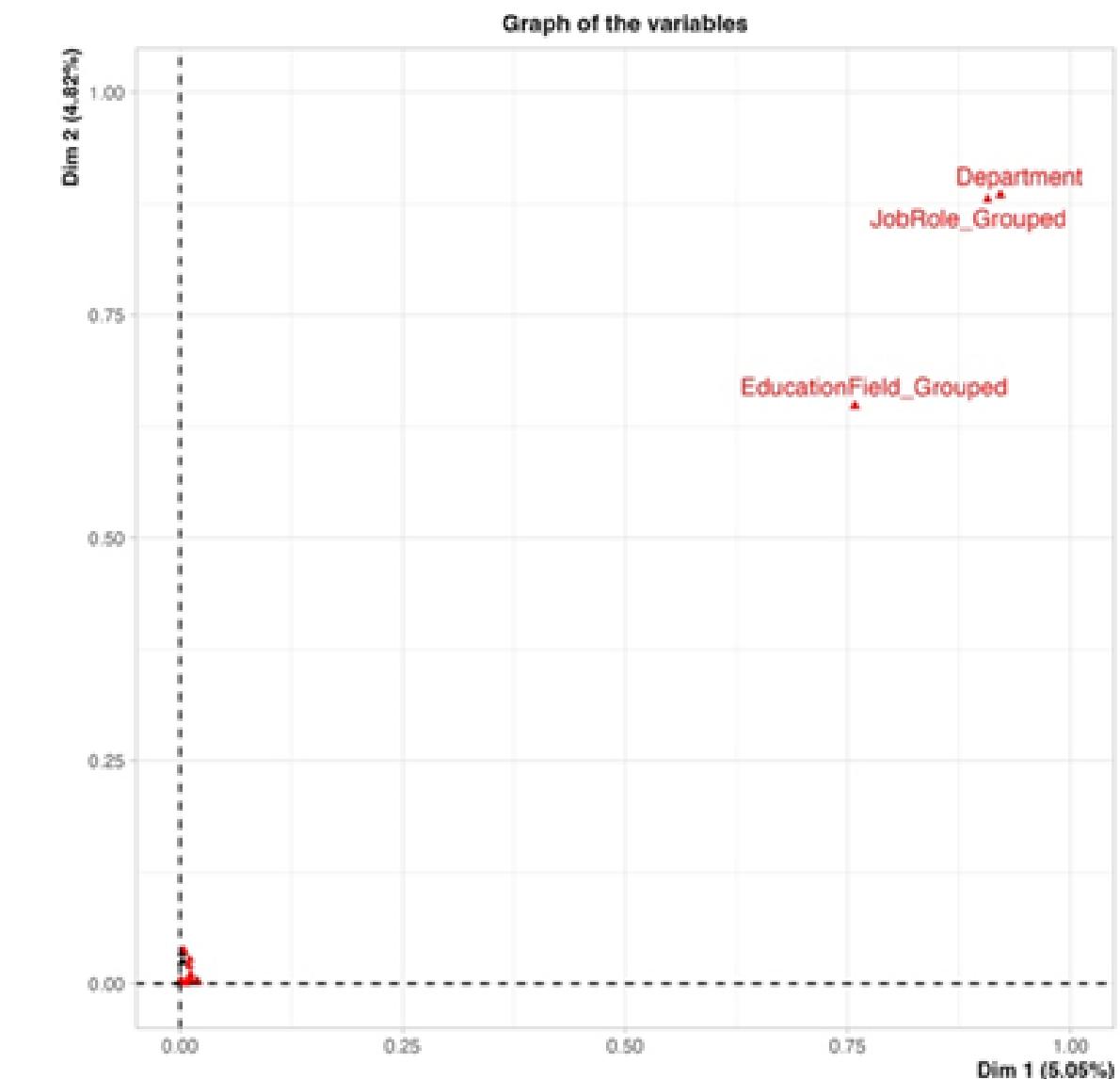
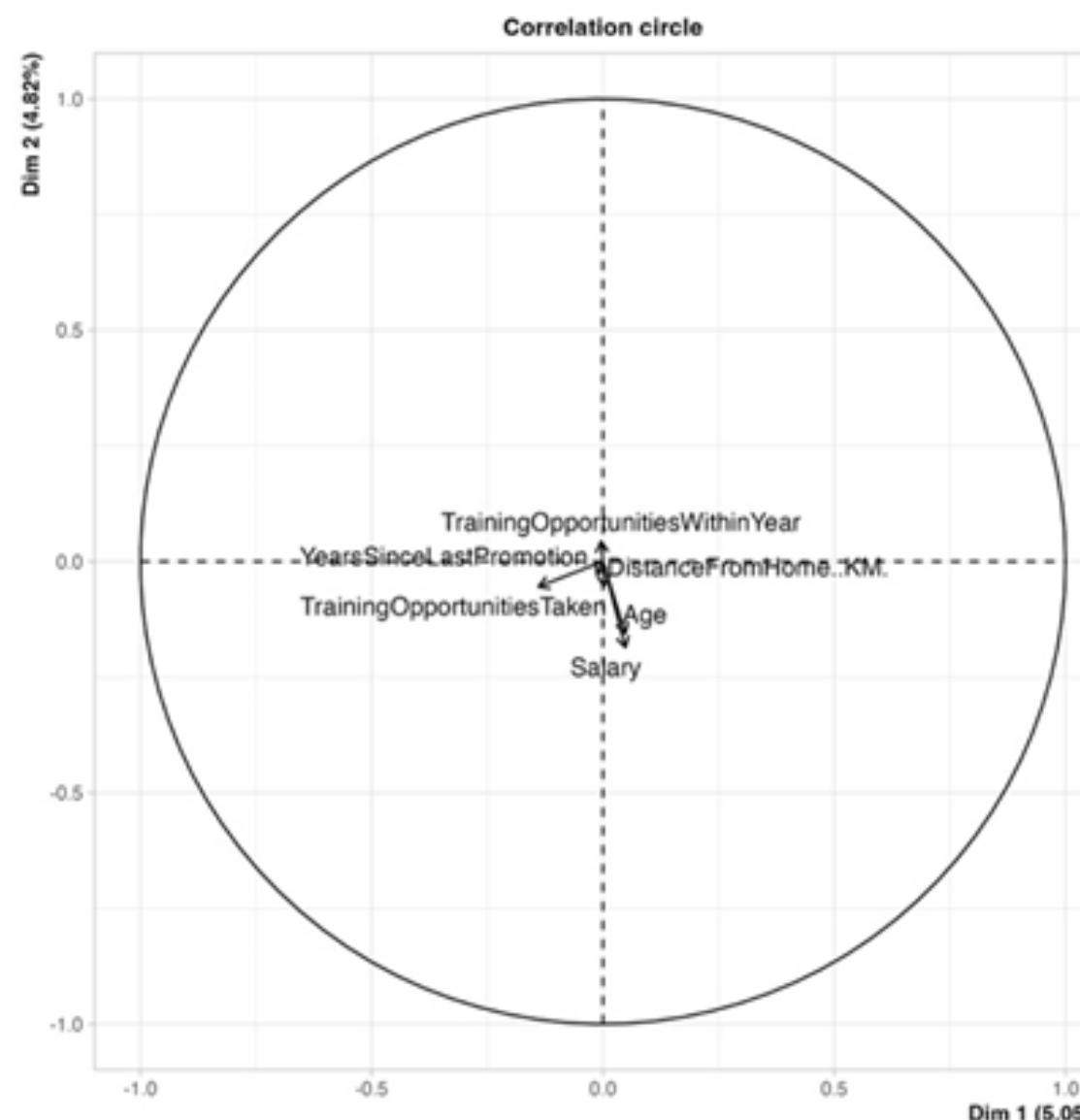
Numerical vs Numerical
Pearson's Correlation



Correlation Test

Age and Salary are correlated

Factor Analysis For Mixed Data



Chi Squared Test

Significant - JobRole_Grouped
EducationField_Grouped
Department

Cramers V

JobRole and Department - **0.973 (very strong)**
EducationField and Department - **0.711 (strong)**
JobRole and EducationField - **0.560 (moderate)**

MODELS FOR PREDICTING EMPLOYEE ATTRITION

MEASURE	XGBOOST	SVM	RANDOM FOREST	CLASSIFICATION TREE
TRAIN ACCURACY	0.880	0.978	0.957	0.854
TEST ACCURACY	0.875	0.875	0.828	0.839
PRECISION	0.693	0.727	0.723	0.547
RECALL	0.575	0.511	0.553	0.745
F1 SCORE	0.628	0.600	0.627	0.630
AUC	0.899	0.873	0.887	0.874

Resampling Technique:
SMOTE

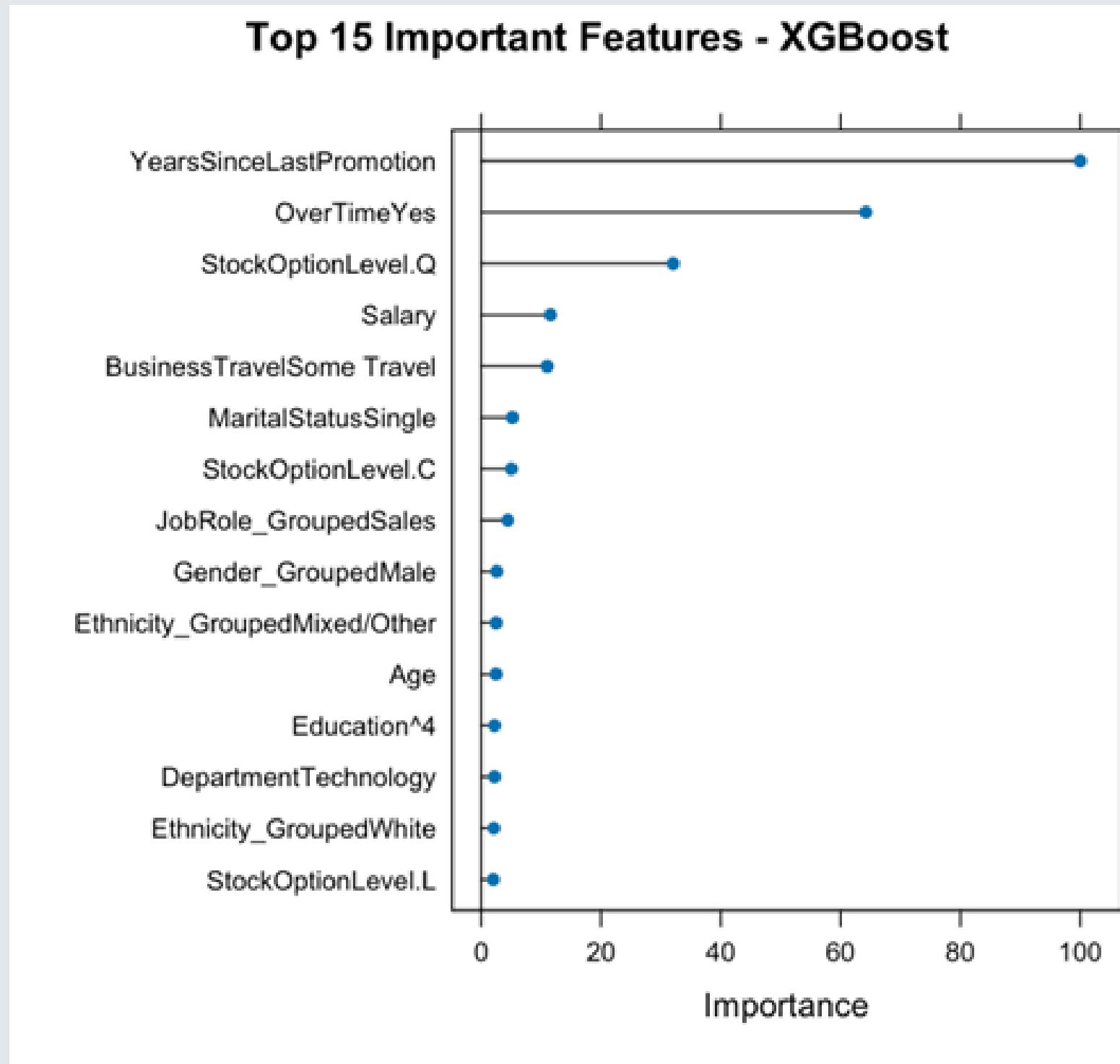
**Best
Predictive
Model**

XGBoost

XGBOOST MODEL

01.

Feature Importance



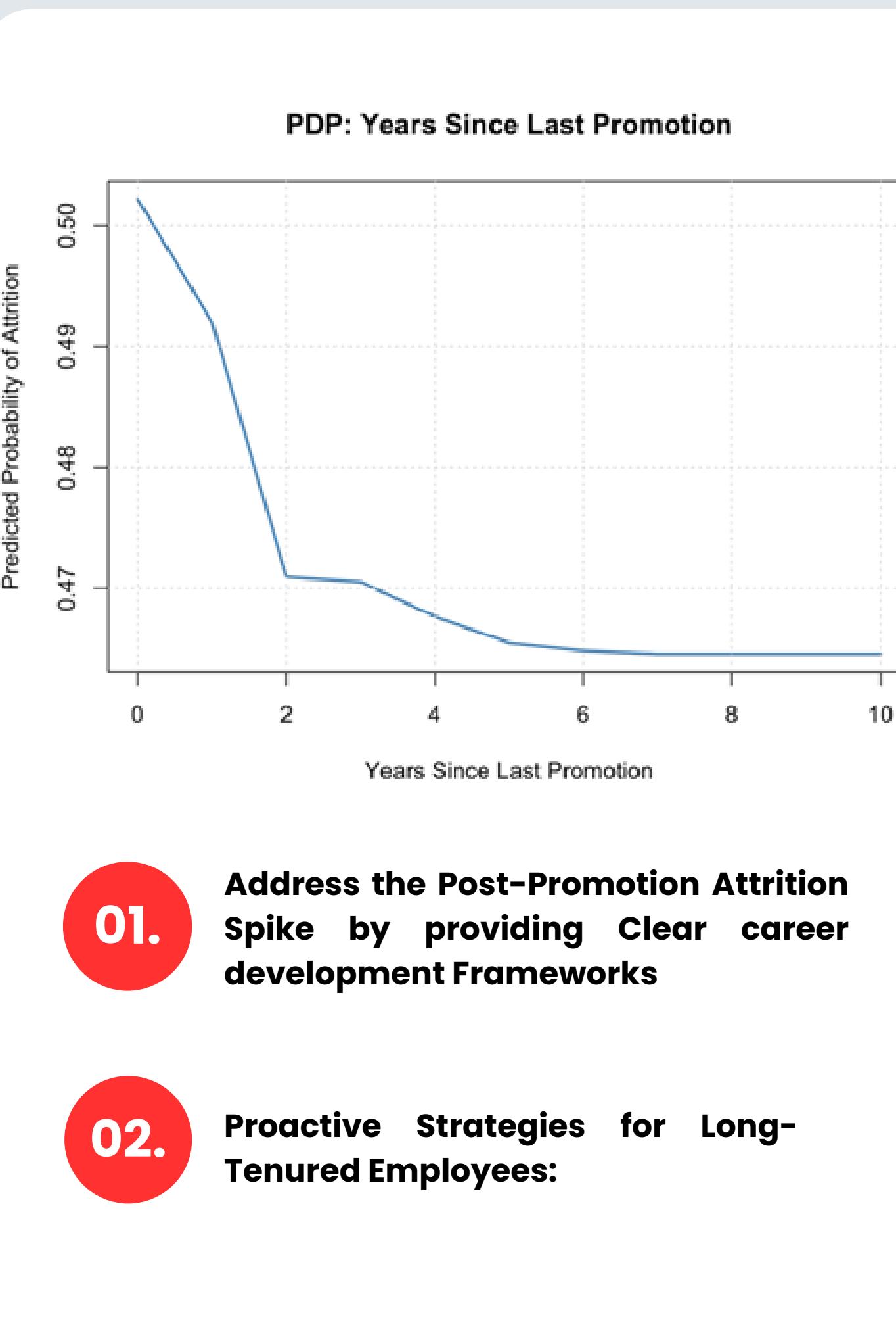
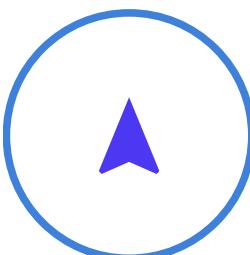
Parameter	Value
n_estimators	250
learning_rate	0.0005
gamma	0
colsample_bytree	0.6
min_child_weight	10
max_depth	6

Most important Features

Years since last promotion
overtime
Stock option
Salary
Business Travel



Promotion: A Double-Edged Sword?



01.

Address the Post-Promotion Attrition Spike by providing Clear career development Frameworks

02.

Proactive Strategies for Long-Tenured Employees:

High Attrition Risk Immediately After Promotion (first 2 years)

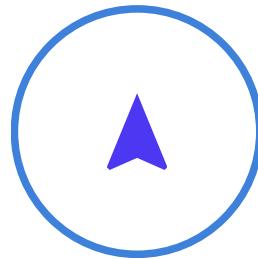
This may indicate unmet expectations, adjustment challenges, or a desire to seek new opportunities post-promotion.

2 – 3 Years post Promotion

After a promotion, attrition drops sharply within 2–3 years, showing that promotions boost morale, engagement, and short-term retention. This suggests that timely career advancement can be a strong lever for employee satisfaction and loyalty.



Balancing Overtime to Prevent Burnout



01.

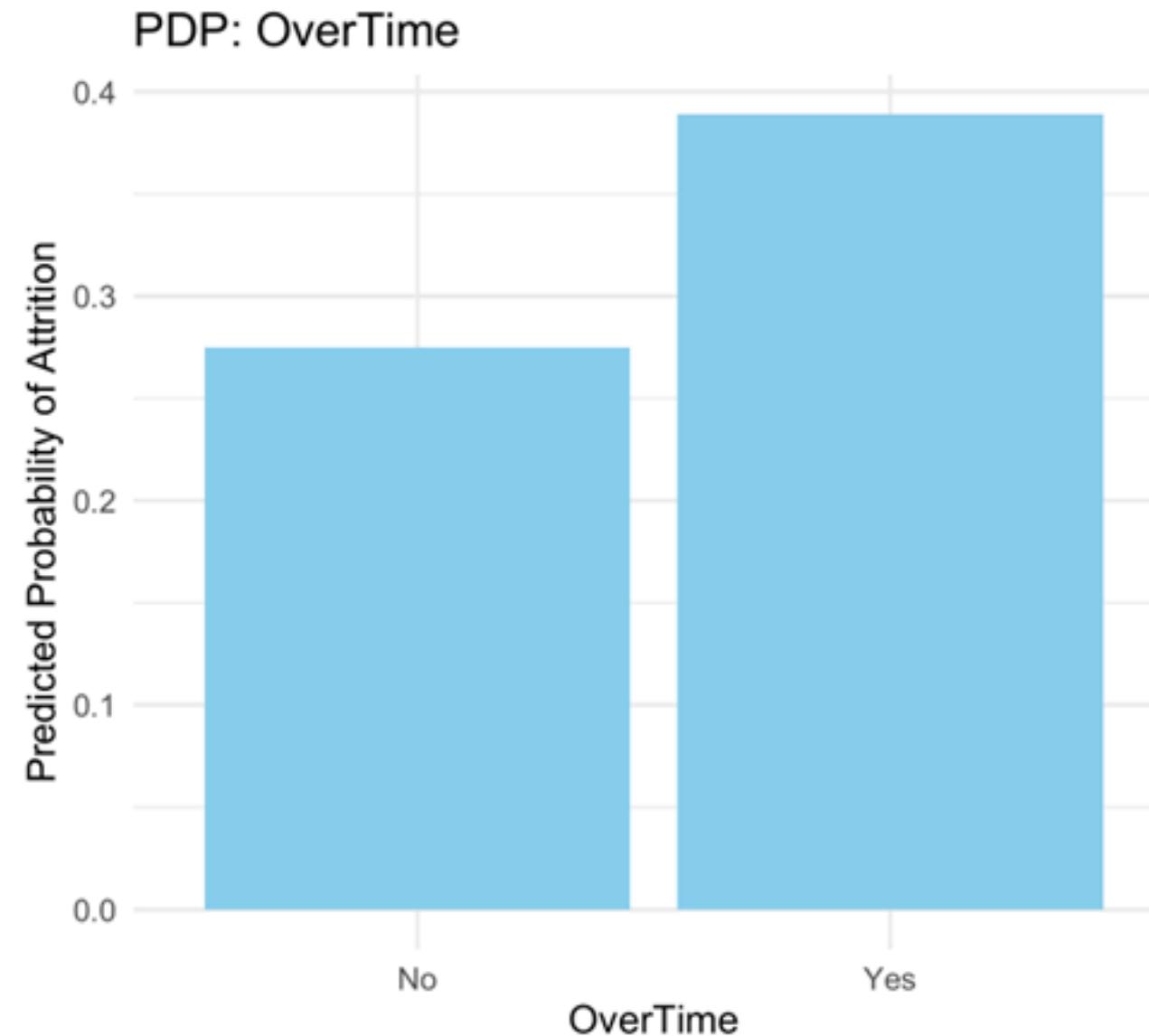
Promote Work-Life Balance

02.

Recognize and Reward
Overtime Efforts

03.

Monitor and Adjust Workloads

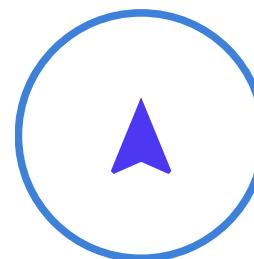


Overtime Increases Attrition Risk ?

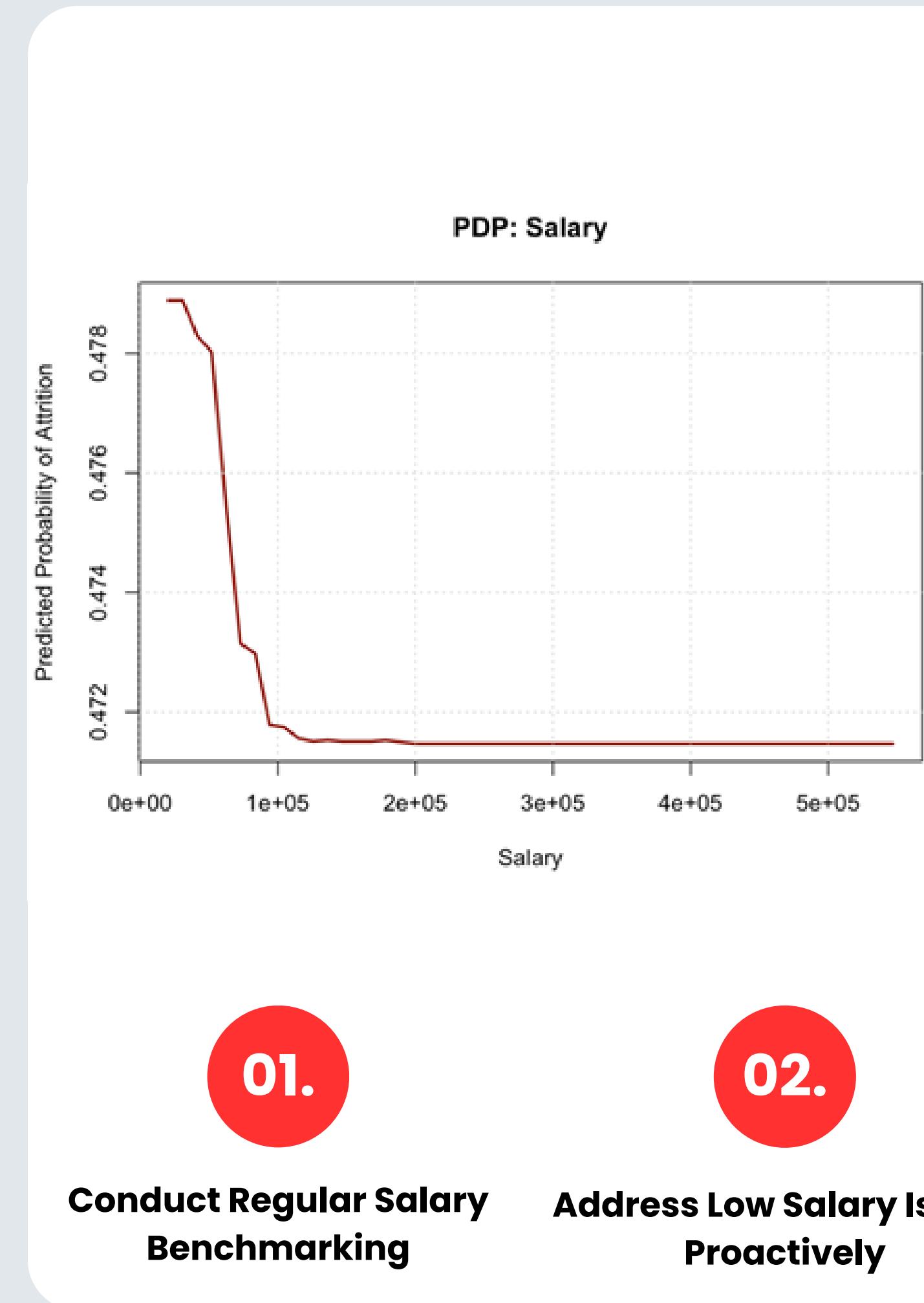
Employees who work overtime show a significantly higher risk of attrition, highlighting a strong link between extended hours and turnover.

Potential Reasons

Burnout & Fatigue
Poor Work-Life Balance
Increased Stress
Lack of Recognition
Limited Personal Time



Optimizing employee
Salary to reduce
attrition



Low Salary, High Attrition Risk (< 100k)

The steepest decline in the attrition curve occurs within this salary range. This indicates that low salary is a strong predictor of employees leaving the organization.

Salary's Limited Influence at the Very high End (>100k)

When salary range goes beyond this level, higher salaries offer diminishing returns on retention, suggesting other factors become more important in reducing attrition.

01.

Conduct Regular Salary
Benchmarking

02.

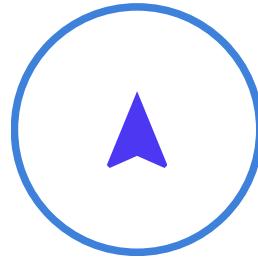
Address Low Salary Issues
Proactively

03.

Focus on Fair and Equitable
Pay



Refining Travel for Retention & Efficiency

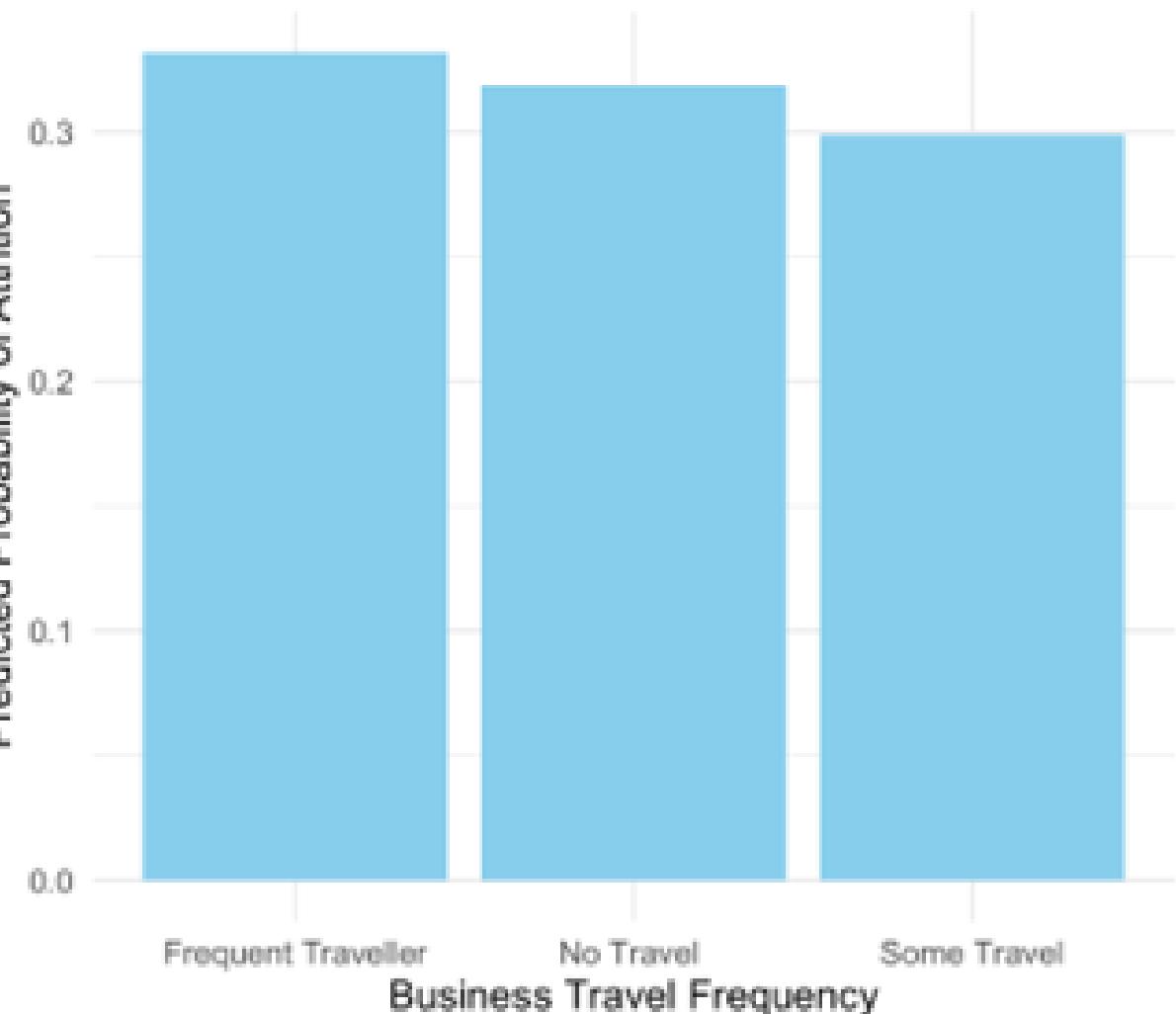


No Travel Group

No Travel: Feeling Disconnected?



PDP: Business Travel



High Attrition risk with frequent Travellers

Frequent business travel can lead to burnout and lifestyle strain, increasing attrition risk

01.

Identify Pain Points
Use surveys or check-ins to understand travel-related stress.

02.

Optimize Travel:
Reduce unnecessary trips; use tech alternatives like video calls.

Explore Opportunities for Engagement
Offer Internal Development and Variety
Consider Occasional Travel or External Engagement

References

01.

Samudika

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03.

Pasindu

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