Addressing Employee Attrition

Utilizing Logistic Regression to determine associations of employee attrition and the effectiveness of retention initiatives

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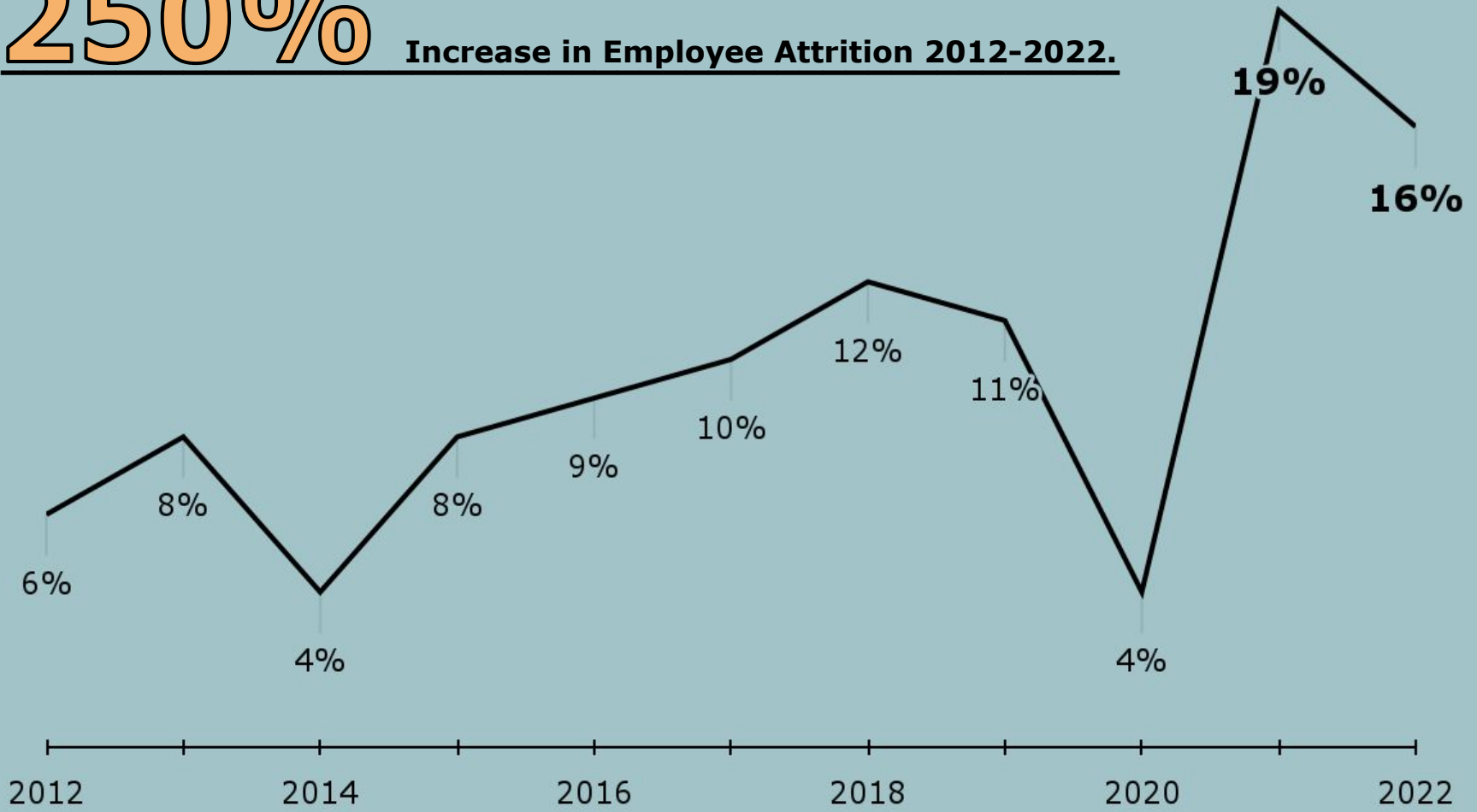
250% Increase in Employee Attrition 2012-2022.



3 Project Driving Questions

1. Which employees are at high attrition risk?

2. What are the root associations of attrition?

3. Which retention initiative will have the greatest impact?

Solution: Logistic Regression Model

Trained using HR employee characteristic data.

1.	**Which employees are at high attrition risk?**	1.	The model ***predicts*** attrition or retention for each employee.
2.	**What are the root associations of attrition?**	2.	The model finds which variables have the ***strongest associations with attrition***.
3.	**Which retention initiative will have the greatest impact?**	3.	The effect of each initiative can be input to the model to ***predict retention benefits***.

Objective: Minimize False Negatives

Model evaluation utilizes ***false positive (FP) and false negative (FN)*** counts.

FP: the model assigns "attrition" to an employee that had stayed at Acme.

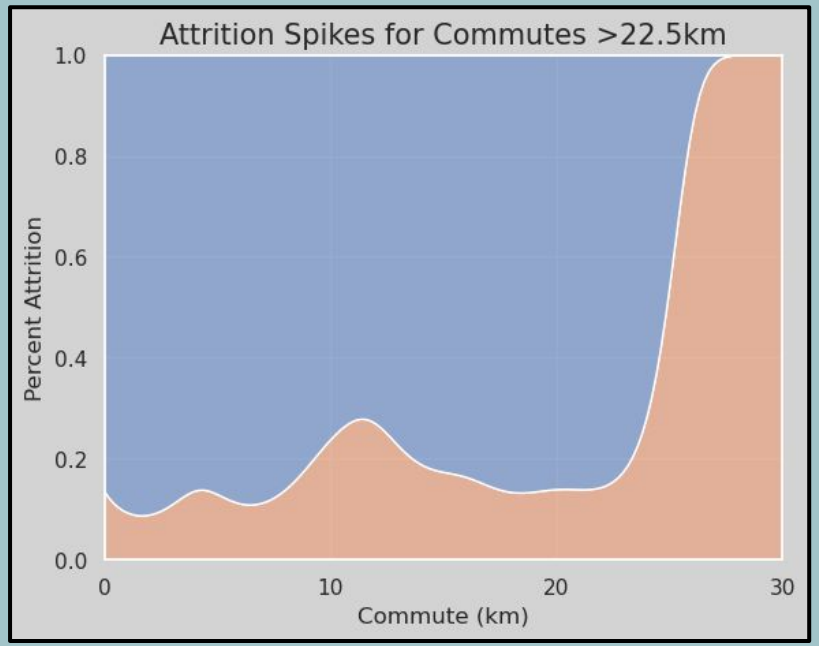
FN: the model assigns "retention" to an employee that had left Acme.

The model can minimize FP's or FN's, neither can be eliminated. For our goals, ***minimize FN's***.

Recall score: ***percentage of lost employees correctly identified***.

F1 Score: high F1 scores show ***model balance***, correctly identifying attrition and retention at high percentages.

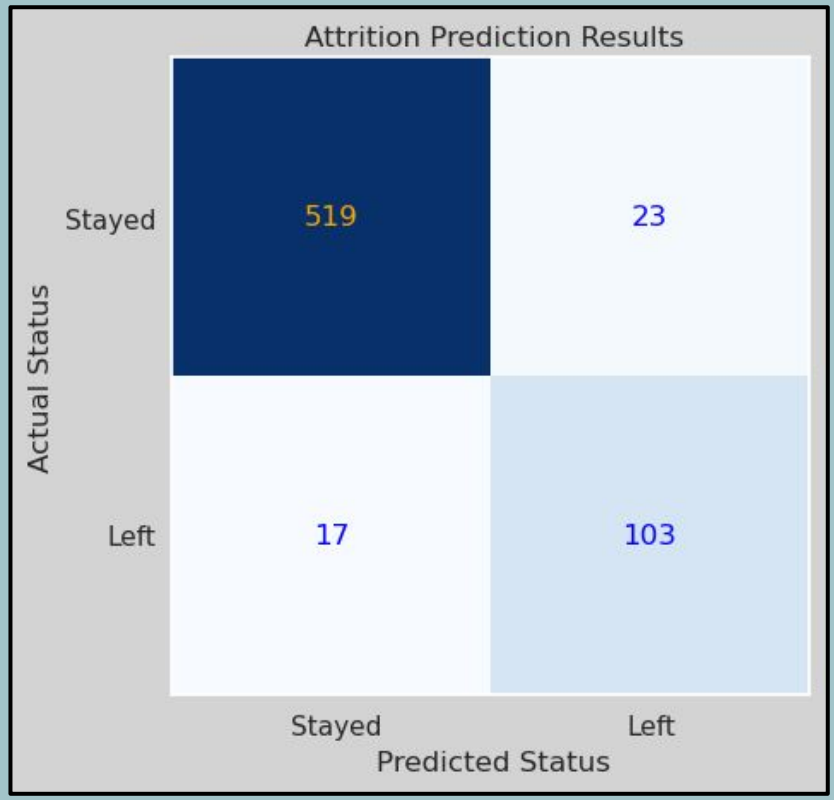
In the Data: Who is Leaving Acme?



Model Evaluation: 86% Recall

Final model results:

- ➔ Correctly ID retention in 519/542 cases.
- ➔ Correctly ID attrition in 103/120 cases.
- ➔ ***86% recall***.
- ➔ ***84% F1 score***.



3 Greatest Root Associations

When controlling for other factors, attrition is…

- ➔ ***2.3x*** more likely ***for single employees***.
- ➔ ***2x*** more likely for each ***7.5km increase in commute***.
- ➔ ***2x*** more likely for every ***3 years since a promotion***.

Variable	Odds Ratio	Lower Estimate	Upper Estimate
Single Status	***2.33***	1.53	3.56
Commute (km)	***2.01***	1.71	2.37
Last Promotion (years)	***1.99***	1.61	2.46

3 Recommended Action Steps

1. ***Implement*** and maintain ***this model***.
2. Select the ***"Limit business travel"*** initiative.
3. Hire individuals:
   a. ***Within 22km.***
   b. ***Not of single marital status.***
   c. That hiring managers note have ***promotion potential***, if possible.

Retention Initiative	**Retention/Savings**
Increased base pay	1 employee/₹30k
Additional professional development	4 employees/₹120k
Workplace flexibility	6 employees/₹180k
Employee appreciation	9 employees/₹270k
Limit business travel	***15 employees/₹450k***

Special Consideration:
"Workplace flexibility" may have further benefits, considering the association of commute distance with attrition.

Potential Limitations

Data limitations:

- ***Missing values*** in dataset.
- ***Class imbalance*** (16% attrition 84% retention).

Model limitations:

- Logistic regression ***does not determine a causal relationship.***
- This model is trained on ***historic data***.

Even with these limitations, this model gains us significant insight into the growing attrition issue.

3 Project Driving Questions: Answered

1. **Which employees are at high attrition risk?**

   The model correctly identifies attrition in 5/6 cases.

2. **What are the root associations of attrition?**

   Single status, long commutes, & years since promotion.

3. **Which retention initiative will have the greatest impact?**

   "Limit business travel" initiative, ₹450k estimated savings.

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