

# Executive Summary

## Problem

Acme Aroma faces a critical employee retention crisis with attrition rates surging from **6% (2012) to 19% (2021)**, a **3x increase**. The 2021-2022 period resulted in **1,355 employee departures, generating ₹29.8 million in acquisition costs, the first acquisition expenses incurred this decade**. This financial burden demands immediate strategic intervention.

## Approach

Analysis used Acme's HRIS data containing attrition outcomes, personal characteristics, professional history, and engagement metrics. A logistic regression model was developed using five key predictors: **Work-Life Balance, Percent Salary Hike, Job Satisfaction, Age, and Distance from Home**. Artificial sampling addressed dataset imbalance (16% attrition vs. 84% retention), and model performance was evaluated using **recall** to optimize catching actual departures.

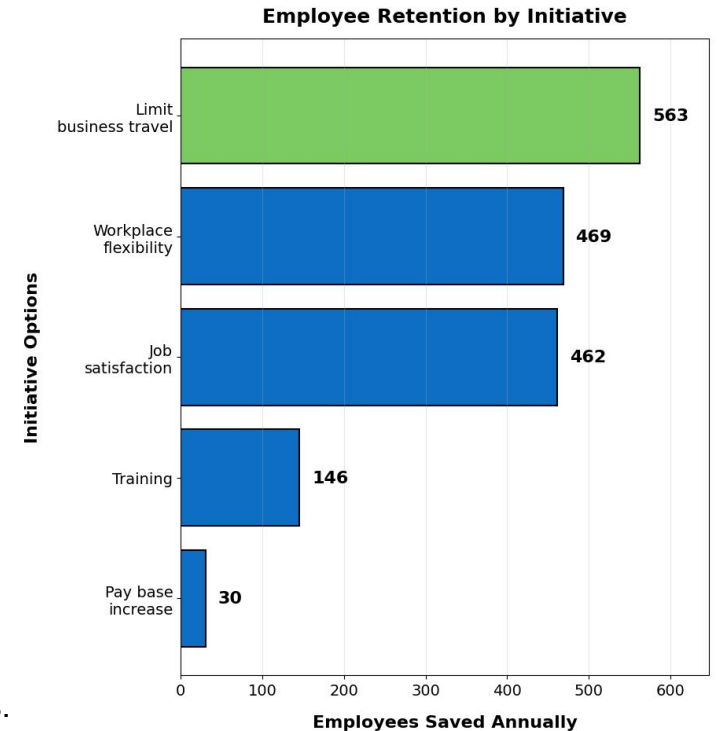
## Limitations

Dataset imbalance (**16% attrition**) and missing values (<1%) were addressed through artificial sampling and mean value assignment. Model relies on **historical patterns**; cannot predict unprecedented external shocks or major organizational changes

## Insights

**Root Cause Analysis:** Employee engagement factors dominate turnover risk. **Work-Life Balance emerges as the strongest protective factor** (Odds Ratio: 0.18), reducing turnover odds by **82%**. Percent Salary Hike (OR: 0.20) and Job Satisfaction (OR: 0.40) follow with 80% and 60% reductions. Age provides moderate protection (OR: 0.63, 37% reduction), while Distance from Home is the only risk-increasing factor (OR: 1.54, 54% increase in departure likelihood).

**Model Performance:** The model successfully identifies **91% of employees who actually leave (recall)** while maintaining **88% overall accuracy**. The model's Type 2 error rate of 9.4% ensures minimal missed departures, the most costly error for Acme. Type 1 errors occur at 12.1%, an acceptable trade-off given the high cost of unexpected turnover vs. preventive retention investments.



## Recommendation - *Implement the predictive model immediately*

**Strategic Initiative: *Limit Business Travel*.** This directly addresses the model's strongest predictor (Work-Life Balance). Increasing work-life balance by 0.3 points reduces attrition probability from **49.6% to 35.4%**, retaining approximately **563 employees annually**. This translates to a **projected cost savings of ₹318 million / year** in avoided recruitment, training, and onboarding expenses. This outperforms alternative initiatives including workplace flexibility (₹265M), employee appreciation programs (₹261M), professional development (₹82M), and base pay increases (₹17M).