

Inside the Attrition Lab: A Predictive People Strategy

Executive Snapshot

Attrition isn't just a number; it's a leak in the organizational engine. This report dives into the why, where, and who behind employee exits using machine learning and storytelling through data. With a sharp accuracy of 86.73%, we mapped the signals that most often precede a goodbye.

Tools & Tech Stack

- Data Source: 30+ employee attributes (age, job role, tenure, salary, attrition status, etc.)
- Languages & Libraries: Python (Pandas, Seaborn, Scikit-learn)
- Interpretability: SHAP (to make the model decisions transparent)
- Visualization: Power BI (for exec-ready dashboards)

The Method: Not Just Crunching Data

1. Cleansing & Refinement: Trimmed off irrelevant columns (like Over18), cleared out duplicates, patched missing data.
2. Preprocessing: Categorical variables were smartly encoded, and numerical values scaled for balance.
3. Predictive Modeling: A logistic regression model was trained to predict attrition.
4. Performance Highlights:
 - Accuracy: 86.73%
 - Insights Transparency: SHAP showed us why the model predicts attrition.

Major Insights That Shouldn't Be Ignored

Attrition Hotspots:

- Departments at Risk: Sales and HR showed unusually high attrition.
- Job Roles: Sales Reps and HR professionals were waving goodbye more than others.

Red Flags That Predict Exits:

- Salary Matters: Lower pay = higher flight risk.
- Promotion Drought: Employees left hanging without a promotion were significantly more likely to leave.
- Age Bracket: Talent aged 26-35 showed the highest exit rates.

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Dashboard That Speaks

Our Power BI dashboard turns data into action:

- Slice-and-dice attrition by department, salary range, job level, gender, and more.
- Interactive filters for deep dives by education, marital status, and promotion history.
- Drill-down views to inspect how overtime culture plays into burnout and exit patterns.

Strategic Interventions That Actually Work

1. Fast-Track Promotions: Don't let top talent stagnate.
2. Pay Attention to Paychecks: Introduce competitive compensation reviews.
3. Targeted Saves: Build retention programs for Sales and HR.
4. Millennial Mentoring: Structure growth roadmaps for younger employees.
5. Overtime Detox: Monitor and manage work-life balance signals.

The Wrap-Up

This isn't just analytics; it's a playbook for people-first HR. With data as our compass and 86.73% predictive power behind us, organizations can now proactively retain their best players.

Attrition isn't just a cost. It's a story waiting to be rewritten. And now, we have the pen.