Business Case: Employee Churn Prediction Pilot Program

This presentation outlines a data-driven pilot program to proactively identify and retain at-risk employees, leveraging predictive analytics to reduce costs and improve organizational stability.

The Challenge

Stemming the Tide: Addressing Employee Churn

Our organization is experiencing significant challenges with employee retention, leading to increased operational costs and disruptions across departments.

High churn rates not only impact productivity but also hinder knowledge transfer and team cohesion.

Stakeholders have identified an urgent need for a proactive, data-driven solution to understand and mitigate this issue.

This pilot program aims to build a predictive model to forecast churn among new employees and provide actionable insights for intervention.

Pilot Program Objectives

Primary Objective

Develop a robust machine learning model to predict which new employees are likely to churn based on historical data.

Secondary Objectives

- Identify key factors driving churn from historical employee data.
- Create a dashboard for visualizing churn predictions and insights.
- Formulate data-backed recommendations to enhance employee retention.

Key Questions & Success Metrics

Analysis Questions

- What are the root causes of employee churn?
- Which specific employees are most likely to leave?
- How does employee satisfaction correlate with churn?
- Are there departments with disproportionately high churn rates?

Project Criteria

- **Success:** Achieve a churn prediction model accuracy.
- **Failure:** An inaccurate model unable to reliably predict churn.
- **Key Trends:** Pinpoint critical features (e.g., satisfaction, salary) influencing churn.
- **Actionable Outcomes:** Deliver concrete strategies to mitigate identified churn risks.

Pilot Deliverables

Predictive ML Model

A machine learning model trained on 15,004 historical employee records to predict churn probability.

Comprehensive Data Report

A detailed report highlighting key drivers of churn identified through in-depth analysis.

Looker Studio Dashboard

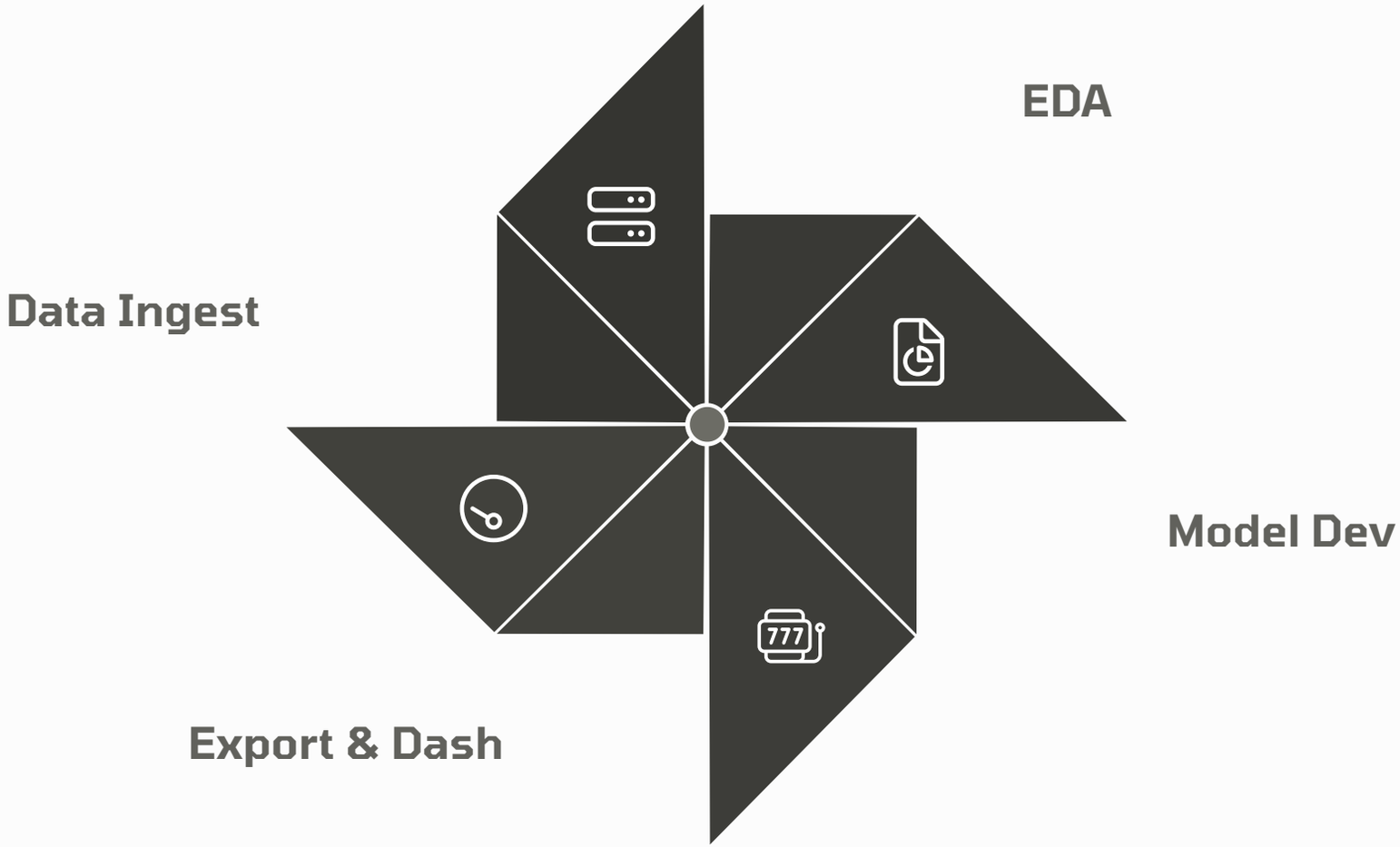
An interactive dashboard visualizing churn predictions for new employees and critical insights.

Actionable Recommendations

Strategic recommendations to improve overall employee retention based on predictive insights.

Technical Approach

From Data to Insight: Our Workflow



This robust workflow ensures data integrity, powerful analytics, and clear visualization, culminating in actionable insights.

Core Technologies

PostgreSQL

Secure and efficient data storage for all employee datasets.

Python & Libraries

For advanced data analysis, manipulation (Pandas), and visualization (Matplotlib, Seaborn).

PyCaret ML

Automated machine learning library for rapid model training and evaluation.

Looker Studio

Interactive and customizable dashboards for stakeholder visualization.

Key Insights from Historical Data

Understanding the Drivers of Churn

- **Satisfaction Level:** Employees with "Very Low" (≤0.2) and "Low" satisfaction have the highest churn rates (62.54% and 49.39%, respectively).
- **Departments:** HR (29.09%), Accounting (26.60%), and Technical (25.62%) departments show the highest attrition.
- **Salary:** Low-salaried employees have a 29.74% churn rate, significantly higher than medium (20.43%) or high (6.63%) earners.
- **Number of Projects:** Extremes of 2 projects (65.62% churn) or 7 projects (100% churn) indicate severe under- or overwork issues.
- **Tenure:** Churn peaks at 5 years (56.55%) and 4 years (34.81%), highlighting a critical mid-tenure risk period.
- **Promotions:** Lack of promotion in 5 years correlates with a 24.22% churn rate, versus 5.96% for promoted employees.

Overall churn rate from 15,004 records stands at **23.83%** (3,576 employees).

Actionable Recommendations

Strategies for Enhanced Retention

Boost Employee Satisfaction

Implement recognition programs and regular surveys to address low satisfaction early.

Target High-Risk Departments

Focus retention efforts on HR, Accounting, and Technical departments with tailored initiatives.

Improve Compensation

Review and adjust salaries for low-to-medium paid employees; introduce performance bonuses.

Optimize Workload

Ensure 3-5 projects per employee to avoid under/overwork; monitor hours to prevent burnout.

Support Mid-Tenure Employees

Develop career development programs for 3-5 year tenure to prevent stagnation.

Promote Career Advancement

Increase promotion opportunities and transparency for all employees.

Leverage Predictive Model

Use the Random Forest model and Looker Studio dashboard to proactively intervene for at-risk employees.

Conclusion

Empowering Retention: A Proactive Approach

By strategically addressing factors like low satisfaction, inadequate salaries, imbalanced workloads, and limited advancement opportunities, our organization can significantly reduce employee churn.

The predictive model and accompanying dashboard offer a powerful, proactive tool for HR to identify at-risk employees and implement targeted retention strategies. This pilot program will pave the way for enhanced employee engagement, fostering a stable and successful workforce.

Thank You!

Aliaa Gamal

alliaagamall@gmail.com