



Knowledge Discovery for HR Turnover Risk and Financial Exposure

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Abstract

Employee turnover creates financial and operational challenges through recruiting, onboarding, training, and productivity loss. This project applies a simplified Knowledge Discovery approach to estimate employee turnover risk and financial exposure. A synthetic HR dataset was created using employee department, salary, overtime status, job satisfaction, and tenure. Excel was used to transform the data into risk scores, risk classes, salary calculations, and estimated financial exposure. Power BI was used to create an interactive dashboard with risk segmentation, department-level analysis, and visual pattern discovery. The results identify high-risk employee groups, show where financial exposure is concentrated, and demonstrate how HR analytics can support workforce planning and decision-making.

Introduction

Employee turnover affects staffing stability, productivity, morale, and business costs. Traditional HR reporting often identifies turnover after it occurs. This project shows how HR analytics and Knowledge Discovery can help estimate turnover risk earlier and connect workforce data to financial impact.

Background

HR analytics and Knowledge Discovery use employee data to support decisions related to retention, compensation, performance, and workforce planning. Turnover risk may be influenced by workload, job satisfaction, tenure, and department-level factors. Estimating turnover cost helps connect HR decisions to business value.

Problem

Organizations may know how many employees leave, but they may not clearly estimate which workforce factors increase risk or how much turnover could cost. This project addresses that gap by transforming workforce indicators into risk classifications and estimated financial exposure.

Methodology

The project followed a simplified Knowledge Discovery process: data selection, preprocessing, transformation, rule-based classification, pattern discovery, and interpretation. A synthetic HR dataset with 15 employee records was created. Risk score was calculated using overtime, low job satisfaction, and low tenure. Employees were classified as low, medium, or high risk. Annual salary and estimated financial exposure were calculated using 50% of annual salary. Power BI was used to model and visualize the results.

Results and Discussion

The dashboard classified employees into low, medium, and high turnover-risk groups. High-risk employees were mainly identified by overtime, low job satisfaction, and low tenure. Department-level analysis showed where risk and estimated financial exposure were concentrated. The dashboard supported pattern discovery by comparing turnover risk class across department, overtime status, and average risk score. These results convert basic workforce data into actionable HR decision-support insights.

Conclusions

- A simplified Knowledge Discovery process can support HR turnover-risk analysis.
- Rule-based classification can identify workforce risk groups.
- Overtime, job satisfaction, and tenure can serve as practical turnover-risk indicators.
- Financial exposure analysis connects HR analytics to business value.
- Power BI improves interpretation through interactive dashboards and visual pattern discovery.

Future Work

- Test the model with real organizational HR data.
- Build an interactive Power BI dashboard.
- Add fairness and bias evaluation.
- Include absenteeism, promotions, and performance history.
- Integrate the model with HRIS or payroll systems.

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