Workforce Data Analysis Report: Faculty of Engineering Attrition Trends

Prepared for: Jane Shaw, HR Business Partner

Prepared by: Omkar Masurekar

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Executive Summary

This report synthesizes insights from the Power BI dashboard and predictive modelling to analyse attrition trends in the Faculty of Engineering and benchmark against other faculties. Key findings include:

- **Attrition Rate:** 51.66% in Engineering, marginally higher than Arts (51.78%) and Medicine (50.50%).
- **Voluntary Departures** dominate (~52.89%), with early-tenure (<1yr) most affected.
- **Predictive Model Accuracy:** 97.2%, identifying 11 high-risk employees in Engineering.
- **Risk Drivers:** Low performance ratings (Low/Medium) and SEW (Average of Satisfaction Engagement and Work Life Balance) scores correlate with higher attrition.

1. Attrition Trends & Patterns

- **Overall Termination Metrics**

Metric	Value
Total Employees	3,000
Active Staff	1,467
Terminated Staff	1,533
Attrition Rate	51.10%

- **Key Trends**

  By Faculty:

  - Engineering and Arts show nearly identical attrition rates (~51.6%), but **Engineering has 52.89% involuntary departures** (highest among faculties).
  - Medicine retains more staff (49.50% active).
  - A gender disparity was noted, with female staff having a slightly higher voluntary termination rate.

  By Termination Category:

  - Voluntary departures peaked in 2023 (289 cases)
  - Involuntary departures are highest in Engineering (52.89%) then in other faculty.

(See **Terminated Staff Analysis** *tab in Power BI for interactive charts.)*

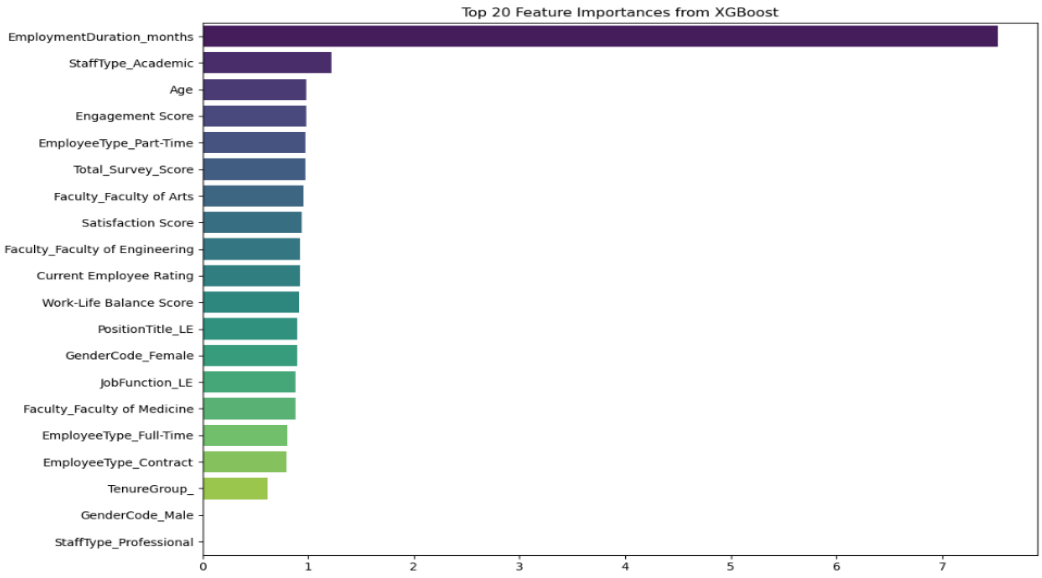
2. Predictive Risk Analysis (XGBoost Model)

XGBoost predicts attrition risk by analysing patterns in historical data and assigning probability scores to employees.

- **Model Performance**

Metric	Value
Model Accuracy	97.20%
% Predicted At Risk	2.80%
High-Risk Employees	41

The XGBoost model identified these key drivers of attrition (in order of importance)



- **High Risk Groups**
  - **Engineering: 11 high-risk employees**, primarily 1-3yrs tenure staff with medium performance groups.
  - **Medicine: 26 high-risk employees**, often medium performers with medium or low total score groups.
  - **Arts: Only 4 high-risk cases**, but medium performers with low and medium engagement groups.

- **Job Titles at Highest Risk for Engineering**
    - Manager (3 predicted exits)
    - Research Fellow (1)
    - Assistant Lecturer (1)
    - Professor(1)
    - Senior Officer(1)
    - Accountant(1)
    - Associate Professor(1)
    - Senior Research Fellow(1)

(See **Predict Terminations for Active Staff** *tab for probability scores and employee details.)*

3. Survey & Performance Insights

- **Risk Distribution by Performance & Engagement**
    - **Engineering:** Employees with low performance + medium SEW scores face **59.34% attrition risk**—the highest of any group.
    - **Arts:** High performers with low SEW show 58.18% risk, indicating engagement drives exits.
    - **Medicine:** Attrition is evenly distributed, with medium performers + low SEW as the largest at-risk group.
- **Termination Drivers**
    - Primary Drivers: Low tenure (<1yr) and low engagement.
    - Secondary Factors: Academic staff (vs. professional) are slightly more likely to leave.

(See **Survey Score Analysis** *tab for faculty-wise breakdowns.)*

4. Recommendations

- **Immediate Actions**
    - Conduct one on ones with high-risk staffs.
    - Address low SEW scores with the staff having high risk of leaving.
- **Long-Term Strategies**
    - Integrate predictive analytics into quarterly HR reviews to flag emerging risks.
    - Develop retention plans like –
        - Performance support for struggling staff.
        - Career pathing for high performers.
        - Engagement Programs

5. Conclusion

- The analysis reveals Engineering's attrition is driven by early-tenure staff and low engagement with 51.66% attrition rate.
- Our predictive model confirms these patterns, with low tenure + low engagement emerging as the dominant risk combination.
- A targeted approach, informed by predictive analytics and survey insights, can effectively reduce turnover. Immediate and sustained action will be critical to building a resilient, engaged workforce.

Attachments:

- Power BI Dashboard
- Python Script (Data Cleaning and Predictive Modelling)