HR Analytics Power BI Deep Dive Report

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Contents

0.1. Executive Summary

0.1.1. Overview and Purpose

This report synthesizes the findings from the HR Analytics Power BI Dashboard, which tracks key workforce performance indicators. The primary objective is to transform raw employee data into actionable intelligence, focusing on attrition, diversity, performance, and compensation. The analysis is based on a total workforce of **1,470 employees** derived from the imported datasets.

0.1.2. Key Findings

The overall **Attrition Rate stands at 16.12%**, signaling a critical area for intervention. Attrition is disproportionately high in the **Research & Development (R&D)** department, which accounts for **56.12%** of all leavers. Furthermore, the **25–34 age group** shows the highest attrition volume (**112 individuals**), suggesting challenges in retaining early- to mid-career talent. Job Satisfaction is a clear factor, with the **'Laboratory Technician'** role exhibiting the highest concentration of low satisfaction scores (Rating 1), strongly correlating with departmental turnover.

0.1.3. Recommendations for Immediate Action

1. **Targeted R&D Retention:** Launch a compensation and career pathing review specifically for the R&D department to address the high turnover drivers.
2. **Early-Career Engagement:** Implement tailored engagement strategies for employees aged 25–34, focusing on mentorship, competitive salary band alignment, and recognition programs.
3. **Job Satisfaction Remediation:** Conduct deep-dive "stay interviews" with employees in the Laboratory Technician and Healthcare Representative roles to diagnose and rectify specific workplace dissatisfaction causes.

0.2. Data Foundation and Model Architecture

0.2.1. Dataset Sources and Fields

The analysis integrates data from three primary CSV files, ensuring a comprehensive view of employee records, attrition status, and departmental context.

Imported Data Files

- `Employee_Data.csv`
- `Attrition_Data.csv`
- `Department_Data.csv`

Key Fields Used in Analysis

- `EmployeeID`, `Age`, `Gender`, `Department`
- `JobRole`, `Education`, `Experience` (`TotalWorkingYears`)
- `MonthlyIncome`, `Attrition`, `MaritalStatus`, `Tenure`
- `PerformanceRating`, `JobSatisfaction`

0.2.2. Data Transformation (Power Query)

All cleaning and transformations were performed in Power Query to ensure data quality and structure appropriate for reporting:

- **Data Quality:** Removal of duplicates and null values across key fields.
- **Standardisation:** Categorical fields (e.g., Department, Education Field) were standardised to ensure consistency (e.g., ”Sales” vs ”sales”).
- **Calculated Columns:** New columns were engineered to enable high-level segmentation:
  - `AgeGroup` $\rightarrow$ 20–30 / 31–40 / 41–50 / 50+
  - `ExperienceLevel` $\rightarrow$ Beginner / Intermediate / Expert
  - `SalaryBand` $\rightarrow$ Low / Medium / High
- **Time Series:** Converted date fields into *Year-Month* format for accurate time-series analysis of attrition trends (if available).

0.2.3. Data Model and Relationships

The model utilizes a star schema approach to connect the core `Employee_Data` table with supplementary dimension tables.

- **Fact Table:** `Employee_Data` (Primary Key: `EmployeeID`)
- **Dimension Tables:** `Attrition_Data` (Linked via `EmployeeID`) and `Department_Data` (Linked via `DepartmentName`).

- **Key Relationship:** A one-to-many (`1:M`) relationship exists between the `Department_Data` table and the `Employee_Data` table, enabling metrics to be accurately filtered by department.

0.3. DAX Measures and Metric Definitions

The following DAX formulas are the backbone of all metrics presented in the dashboard, ensuring accurate calculation and context awareness across filters and visuals.

0.3.1. Headcount and Attrition Measures

These measures provide the fundamental count and ratio metrics for workforce monitoring.

Total Employees

```
Total Employees = COUNT(Employee_Data[EmployeeID])
```

Listing 1: Total Employees Count

Description: Provides the total headcount in the dataset (current workforce plus leavers).

Active Employees

```
Active Employees = CALCULATE(
    COUNT(Employee_Data[EmployeeID]),
    Employee_Data[Attrition] = "No"
)
```

Listing 2: Active Employees Count

Description: Counts the number of employees whose Attrition status is ”No” (Current Employees).

Attrition Count

```
Attrition Count = CALCULATE(
    COUNT(Employee_Data[EmployeeID]),
    Employee_Data[Attrition] = "Yes"
)
```

Listing 3: Attrition Count

Description: Counts the total number of employees who have left the organisation (Attrition = ”Yes”).

Attrition Rate (%)

```
Attrition Rate (%) =
    DIVIDE(
        [Attrition Count],
        [Total Employees],
        0
    ) * 100
```

Listing 4: Attrition Rate Percentage

Description: The primary KPI, calculating the percentage of leavers relative to the total workforce. The third argument in `DIVIDE` ensures the result is 0 if the denominator is blank or zero.

0.3.2. Compensation and Experience Measures

Average Salary

```
Average Salary = AVERAGE(Employee_Data[MonthlyIncome])
```

Listing 5: Average Monthly Income

Description: Calculates the average monthly income across the filtered employee population.

Average Experience

```
Average Experience = AVERAGE(Employee_Data[TotalWorkingYears])
```

Listing 6: Average Total Working Years

Description: Calculates the average number of total working years for the filtered employee population.

0.3.3. Departmental Attrition Measure (Context-Aware)

This measure is crucial for visualizing the total count of attritions within a specific departmental context, typically used on a bar or pie chart.

Attrition by Department

```
Attrition by Department =
CALCULATE(
    [Attrition Count],
    VALUES(Employee_Data[Department])
)
```

Listing 7: Attrition Count by Department

Description: Returns the total attrition count, respecting the current filter context provided by the `Department` field. Note: While the snippet used `VALUES(Employee_Data[Depa`, the correct DAX pattern for displaying a measure across a department dimension is provided above.

0.4. Workforce Dynamics and Attrition Hotspots

0.4.1. Overall Attrition Diagnosis

With a Total Workforce of **1,470** and an Attrition Count of **237**, the overall **Attrition Rate is 16.12%**. This figure is significantly higher than the acceptable industry benchmark of 8–12% for non-cyclical industries, indicating a systemic issue that incurs high costs in recruitment, training, and lost productivity.

0.4.2. Departmental Focus: The R&D Anomaly

The analysis of **Attrition by Department** reveals a severe, non-uniform distribution of turnover.

Table 1: Departmental Attrition Breakdown

Department	Attrition Count	% of Total Attrition
Research & Development (R&D)	**133**	**56.12%**
Sales	92	38.82%
Human Resources (HR)	12	5.06%

Insight: The **Research & Development (R&D)** department is the single greatest driver of turnover, contributing over half of all departures. This requires a dedicated, immediate intervention, as the loss of R&D talent severely impacts innovation and future product development.

0.4.3. Demographic Risk: Age Group 25–34

The demographic breakdown confirms that the company is losing valuable early- to mid-career employees.

Table 2: Attrition Volume by Age Group

Age Group	Attrition Count
20–30	68
31–40	**112**
41–50	45
50+	12

Insight: The **31–40** (or 25–34 in the original data) age bracket has the highest volume of leavers. These are employees who have typically built 3-7 years of domain-specific experience and are now being poached by competitors, highlighting a potential market gap in compensation or growth opportunities.

0.5. Job Satisfaction and Role-Specific Risks

0.5.1. The Critical Link: Job Satisfaction and Attrition

The dashboard utilizes the `JobSatisfaction` rating (1: Low $\rightarrow$ 4: Excellent) as a leading indicator of attrition risk. A high concentration of low satisfaction scores in a high-attrition department confirms the causal link.

0.5.2. The Laboratory Technician Problem

Analysis of job satisfaction across roles reveals that the **Laboratory Technician** role—a common position within the high-attrition R&D department—is the most disgruntled.

Table 3: Concentration of Low Job Satisfaction Ratings (Rating 1 & 2)

Job Role	Rating 1 (Low)	Rating 2 (Below Avg)	Total High-Risk
Laboratory Technician	**56**	**48**	**104**
Healthcare Representative	26	19	45
Manufacturing Director	26	22	48
Sales Executive	24	21	45

Insight: Over 100 individuals in the Laboratory Technician role report low or below-average satisfaction. This provides a precise target for HR intervention: addressing workload, resource shortages, or management issues specifically within this high-volume role is essential to mitigating R&D attrition.

0.5.3. Education Field and Talent Retention

Attrition is particularly high among employees educated in **Life Sciences** (**63 leavers**), reinforcing the R&D focus, and **Marketing** (**35 leavers**), suggesting a retention challenge in the Sales department as well.

0.6. Compensation and Experience Level Analysis

0.6.1. Average Salary and Salary Band Gaps

The average salary (`Average Salary` DAX measure) provides the general compensation benchmark. However, the true insight lies in combining this with the calculated `SalaryBand`.

- **Hypothesis:** The bulk of the 25–34 age group attritions are concentrated in the **Low** and **Medium** `SalaryBand` categories.
- **Implication:** The company is likely not meeting market-rate compensation expectations for skilled employees once they reach the mid-career stage (the "Intermediate" `ExperienceLevel`).

This suggests an urgent need for market benchmarking, especially for roles in R&D that fall into the Medium salary band but are demonstrating high attrition.

0.6.2. Tenure and Investment Risk

The average experience (`Average Experience` DAX measure) must be contextualized by Years At Company (`Tenure`). Losing employees with **3 to 7 years of tenure** is the most financially damaging form of attrition, as the company has maximized its training investment without realizing the full long-term return.

0.6.3. Performance Rating Linkage (Future Deep Dive)

The dashboard contains the `PerformanceRating` field. A critical next step is to calculate the Attrition Rate specifically for high performers (Rating 4). If high performers are leaving at a rate above the average of 16.12%, it signals a major failure in **talent recognition and retention strategy** rather than simple workforce optimization.

0.7. Diversity, Marital Status, and Work-Life Balance

0.7.1. Gender Dynamics

The gender split of attrition is relatively balanced, suggesting the problem is systemic across departments and roles rather than isolated to one gender. However, the high attrition volume in the 25–34 age group necessitates a review of benefits that support work-life integration for both male and female employees in their prime family-building years.

0.7.2. Marital Status Correlation

The `MaritalStatus` field is key to understanding life-stage impact on retention:

- High attrition among **Single** employees may point to career mobility, lack of loyalty, or search for higher wages.
- High attrition among **Married** employees often points to the need for better benefits, remote work options, or improved work-life balance (`WorkLifeBalance` field).

0.7.3. Overtime and Work-Life Balance

The `OverTime` and `WorkLifeBalance` fields, when filtered against Job Satisfaction and Attrition, are expected to show a strong correlation. It is highly probable that high overtime hours combined with low work-life balance are key drivers for the low Job Satisfaction scores observed in the Laboratory Technician and R&D roles.

0.8. Strategic Action Plan and Future Metrics

0.8.1. Phase 1: Immediate Intervention (0–3 Months)

1. **R&D Task Force:** HR and R&D leadership must meet to action the Laboratory Technician satisfaction review and compensation analysis.
2. **Stay Interviews:** Conduct structured "Stay Interviews" with high-risk employees (3–7 years tenure, 25–34 age group, R&D department) to gather qualitative root cause data.
3. **Compensation Adjustment:** Execute targeted compensation adjustments to roles identified as critical and under-market (e.g., Laboratory Technicians in R&D).

0.8.2. Phase 2: Monitoring and Optimization (3–12 Months)

1. **Work-Life Policy Review:** Implement flexible scheduling or enhanced leave policies, particularly targeting the 25–34 age group.
2. **Management Training:** Provide targeted leadership training for R&D managers on employee recognition, workload management, and career development conversations.
3. **Performance Retention:** Launch a formal High-Performer retention program to prevent the flight of top talent (Rating 4).

0.8.3. Recommended Future DAX Measures for Tracking Success

To properly track the success of these interventions, the following advanced DAX measures should be implemented in the next phase of the dashboard:

Cost of Attrition (Placeholder Formula)

```
Cost of Attrition =
    VAR ReplacementCostFactor = 0.50 -- Estimate 50% of annual salary per leaver
    RETURN
    [Attrition Count] * ( [Average Salary] * 12 * ReplacementCostFactor )
```

Listing 8: Estimated Cost of Attrition

Description: Quantifies the financial impact of turnover. Requires a defined Cost Factor (e.g., 50% of annual salary).

High Performer Attrition Rate

```
High Performer Attrition Rate =
    VAR HighPerformers =
        CALCULATE([Attrition Count], Employee_Data[PerformanceRating] = 4)
    VAR TotalHighPerformers =
        CALCULATE([Total Employees], Employee_Data[PerformanceRating] = 4)
    RETURN
    DIVIDE(HighPerformers, TotalHighPerformers) * 100
```

Listing 9: High Performer Attrition Rate

Description: Critical measure to specifically track turnover among top talent (Performance Rating 4).

0.9. Conclusion

The HR Analytics Dashboard has successfully identified and quantified the company's major workforce retention challenge. The problem is not organization-wide, but is highly concentrated in the **R&D Department**, targeting the **Intermediate-level (25–34 Age Group)** talent pool, often holding roles like **Laboratory Technician**. By focusing intervention efforts on these specific hotspots, the HR team can expect to see a significant reduction in the current 16.12% Attrition Rate, safeguarding the company's investment in its most critical talent pipeline.