



Employee Attrition Analytics

A predictive analytics framework to proactively identify and manage high-risk employee exits.

Team Members:

Saumya Kumar	2401010432
Bulbul Agarwalla	2401010131
Jatin Verma.	2401010200
Yachna.	2401010509
Supreet.	2401010465
Aditya Ranjan.	2401010035

Sector : IT





Context & Problem Statement

Sector Context:

- Employee attrition is a major challenge for organizations as it increases recruitment costs, reduces productivity, and impacts team morale. HR leaders require data-driven insights to understand why employees leave.

Problem Statement:

- What factors drive employee attrition, and how can organizations proactively reduce turnover?

Objective:

- To analyze workforce data and generate actionable insights that help HR decision-makers minimize attrition risk.



• . . .
• . . .
• . . .
• . . .



Data Engineering

01

Source:

Employee Attrition Prediction Dataset

Platform: [Kaggle](#)

Size: 10,051 Rows, 26 Columns

03

Key Data Dictionary Columns:

- Attrition (Target)
- Department
- Job Role
- Monthly Income
- Job Satisfaction
- Work-Life Balance
- Overtime

02

Cleaning Performed:

- Standardized categorical values (Yes/No inconsistencies)
- Checked missing/null values
- Validated numeric ranges (Age, Income, Ratings)

KPI & Metrics Framework

Why These KPIs?

These metrics summarize workforce stability, financial cost exposure, and employee experience , directly linked to attrition risk.

Primary KPIs:

- **Total Employees** = COUNT(Employee_ID)
- **Attrition Rate** = COUNTIF(Attrition="Yes")/Total Employees
- **Average Monthly Income** = AVERAGE(Monthly_Income)
- **Average Job Satisfaction** = AVERAGE(Job_Satisfaction)
- **Average Work-Life Balance** =AVERAGE(Work_life_Balance)



Key Insights (EDA)

Major Observations from Exploratory Analysis

- Overall attrition rate stands at 18.15%, indicating notable workforce instability
- IT department records the highest attrition (19.25%)
- Assistant roles show the highest turnover risk (19.97%)
- Attrition differences across job satisfaction levels are minimal
- Employees with poor work-life balance show higher exit counts
- Salary band strongly influences attrition (High salary → lowest attrition)



"Attrition patterns are driven more by compensation and work-life balance than demographic factors."



Advanced Analysis

Analytical Approach

- Department-level attrition comparison
- Salary vs Job Level trend evaluation
- Segmentation by Work-Life Balance & Satisfaction
- Distance-from-home grouping analysis

Insight Statement:

Attrition emerges from structural and experience-related factors rather than performance alone.

Key Findings

- Compensation structure shows unexpected anomalies (Level 5 income lower than mid-levels)
- Work-life imbalance linked with increased attrition
- Commute distance (21–30 km) associated with higher exits
- Performance ratings show limited influence on attrition

Dashboard Structure & Design

Dashboard Layout Strategy:-The dashboard was designed using a structured analytical hierarchy:

Top Row – KPI Cards

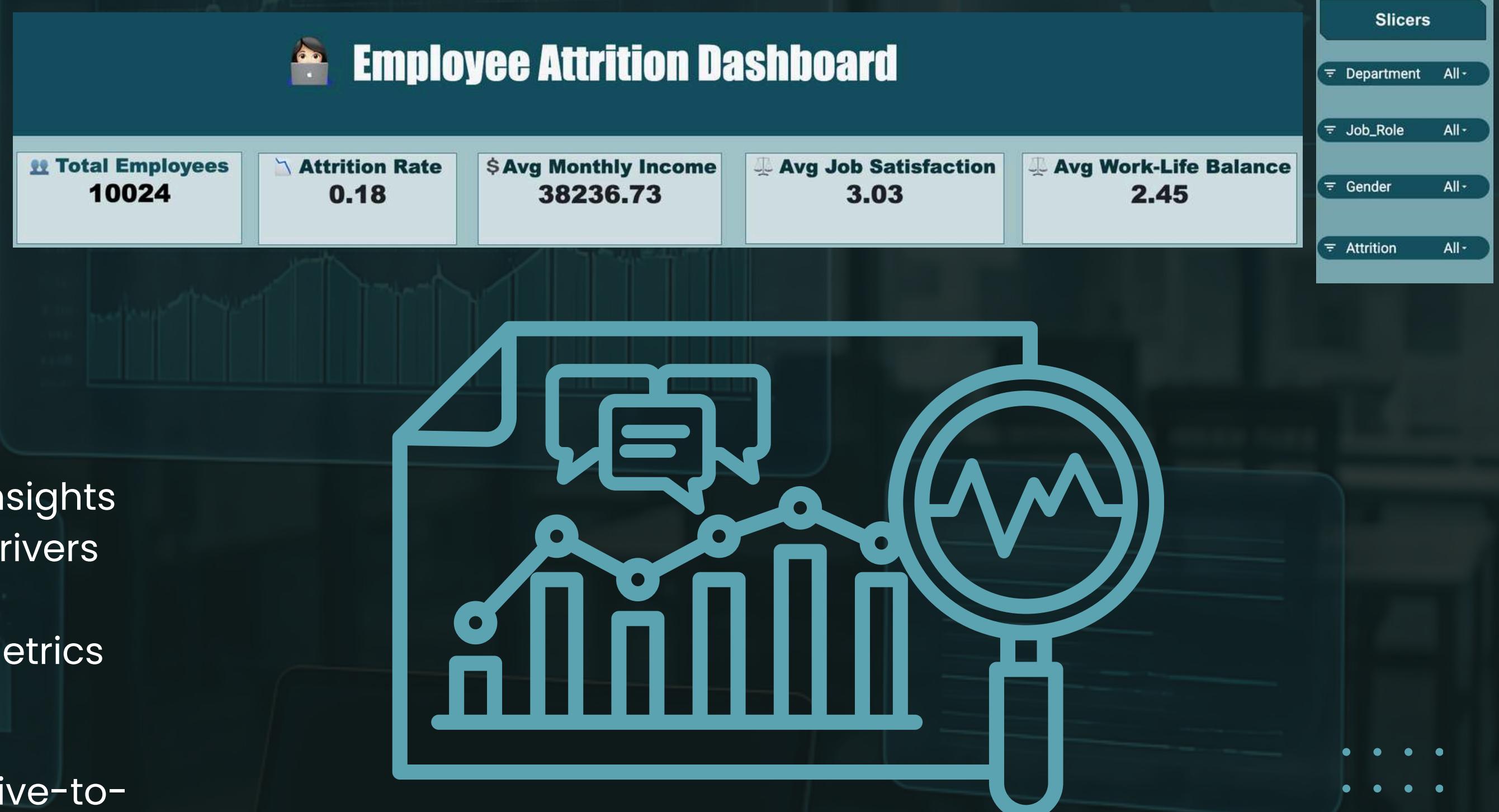
- Total Employees
- Attrition Rate
- Avg Monthly Income
- Avg Job Satisfaction
- Avg Work-Life Balance
-

Core Analysis Sections

- Attrition Analysis
- Salary & Compensation Insights
- Satisfaction & Work-Life Drivers
- Demographic Patterns
- Performance & Training Metrics

Design Principle:

“The layout follows an executive-to-operational drill-down approach.”



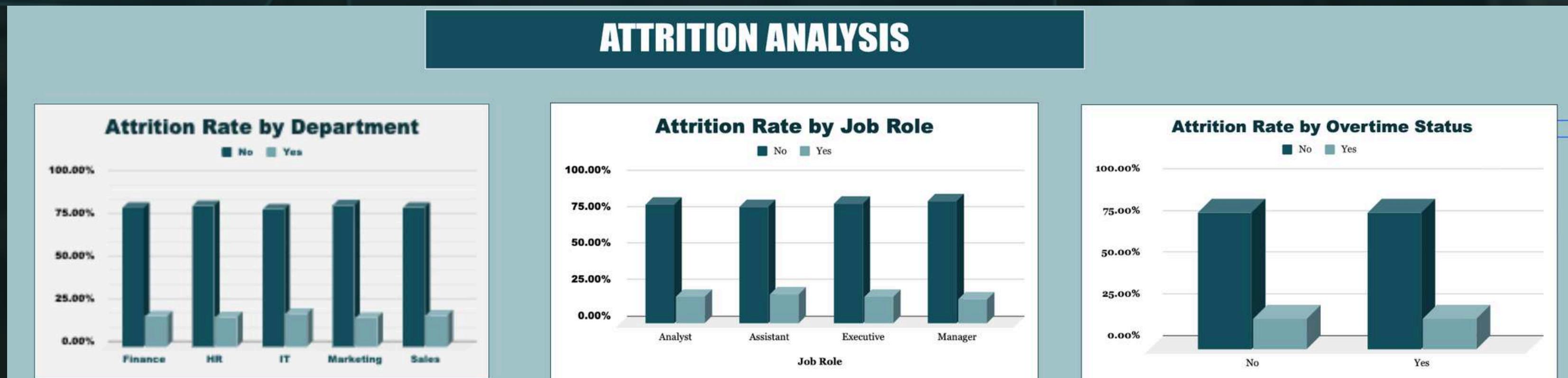
...
...
...



Attrition Analysis Highlights

Key Findings

- Attrition Rate ≈ 18% of workforce
- IT Department shows highest attrition
- Assistant Role has highest turnover
- Overtime impact observed but not dominant
- Satisfaction levels show moderate variation



"Attrition risk is concentrated within specific departments and job roles rather than uniformly distributed."

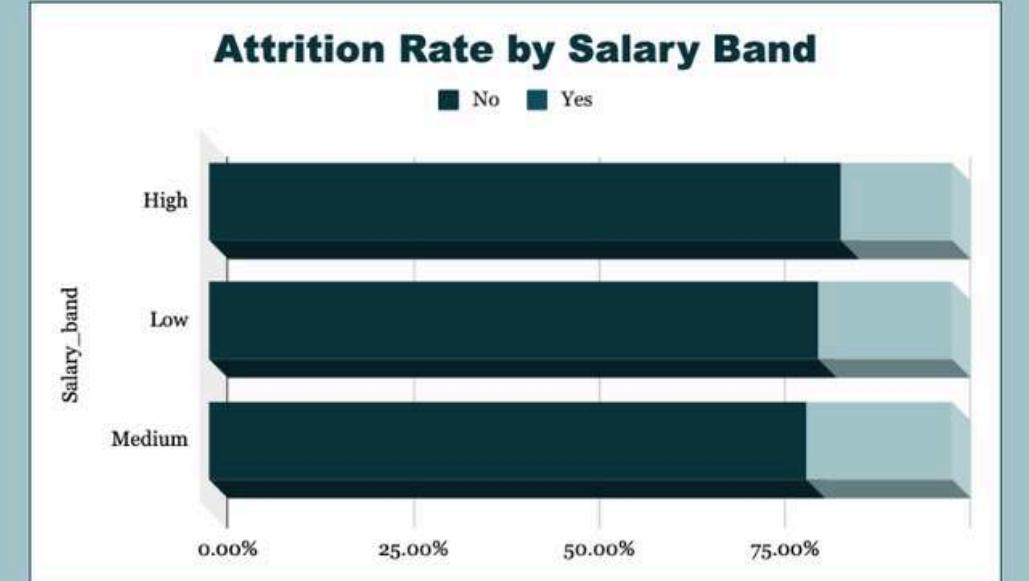
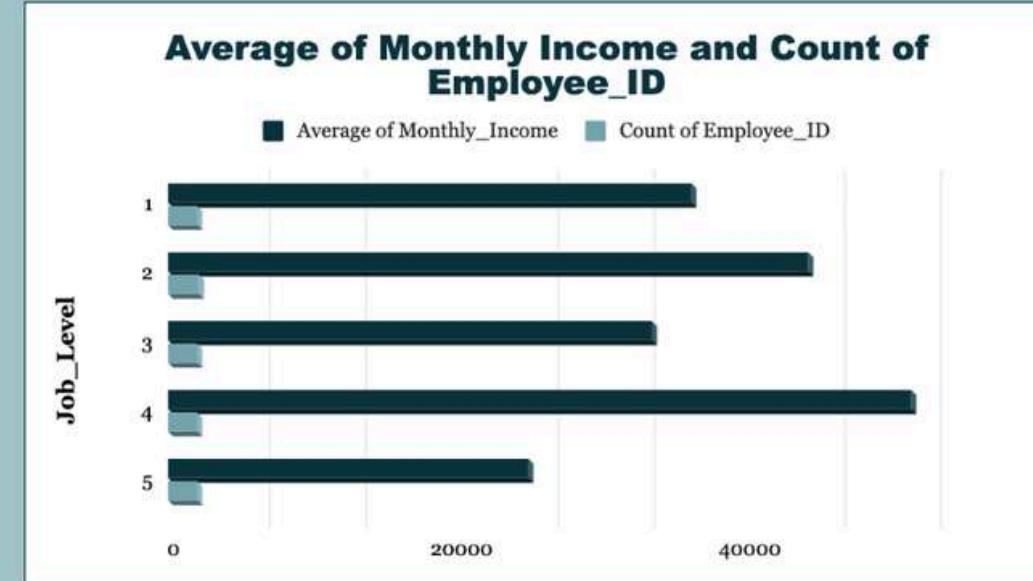
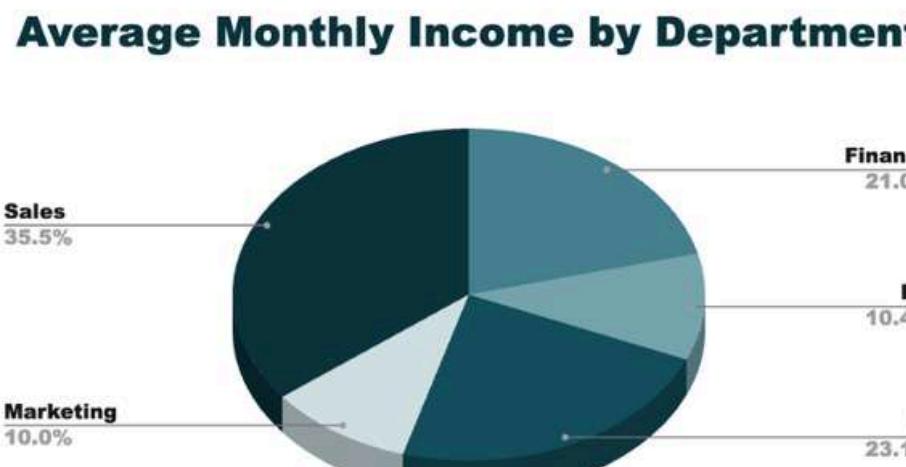


Salary & Compensation Insights

Compensation Observations

- Sales department has highest average income
- HR & Marketing show significantly lower income
- Salary progression across Job Levels shows anomalies
- High Salary Band → Lowest Attrition

SALARY ANALYSIS



"Compensation imbalance and structural inconsistencies may influence employee retention."

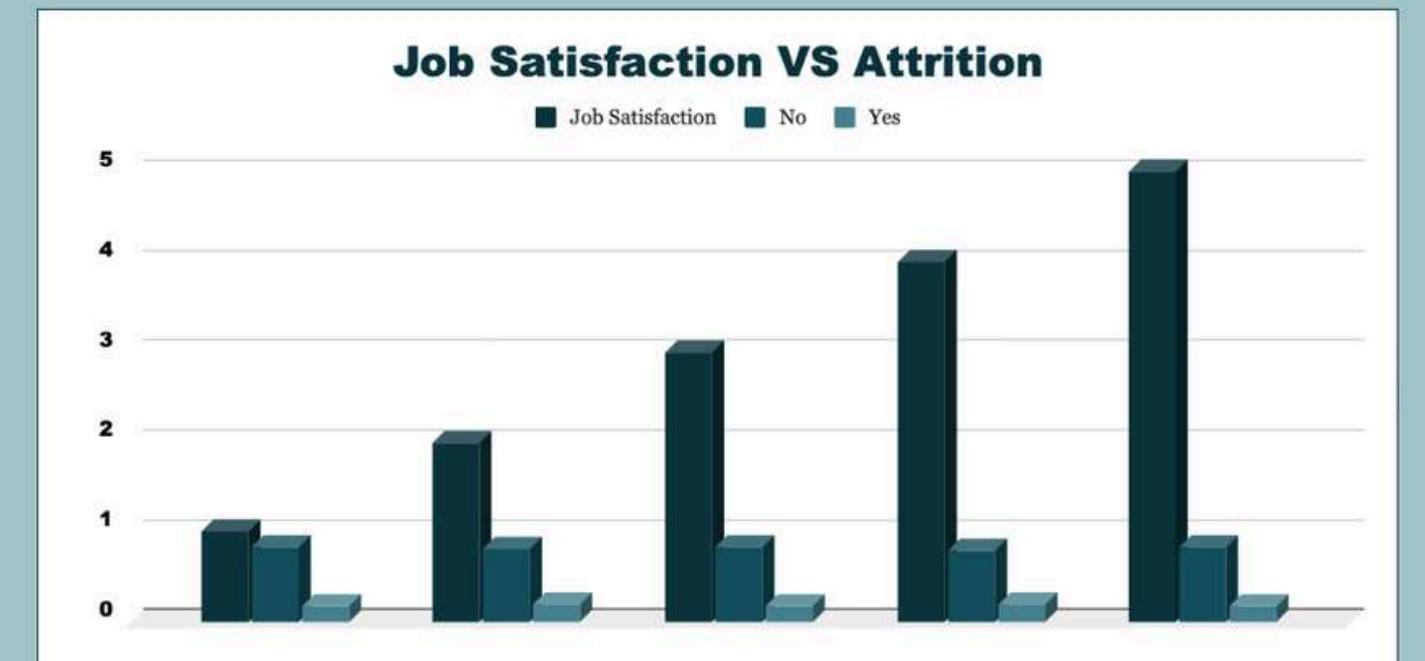
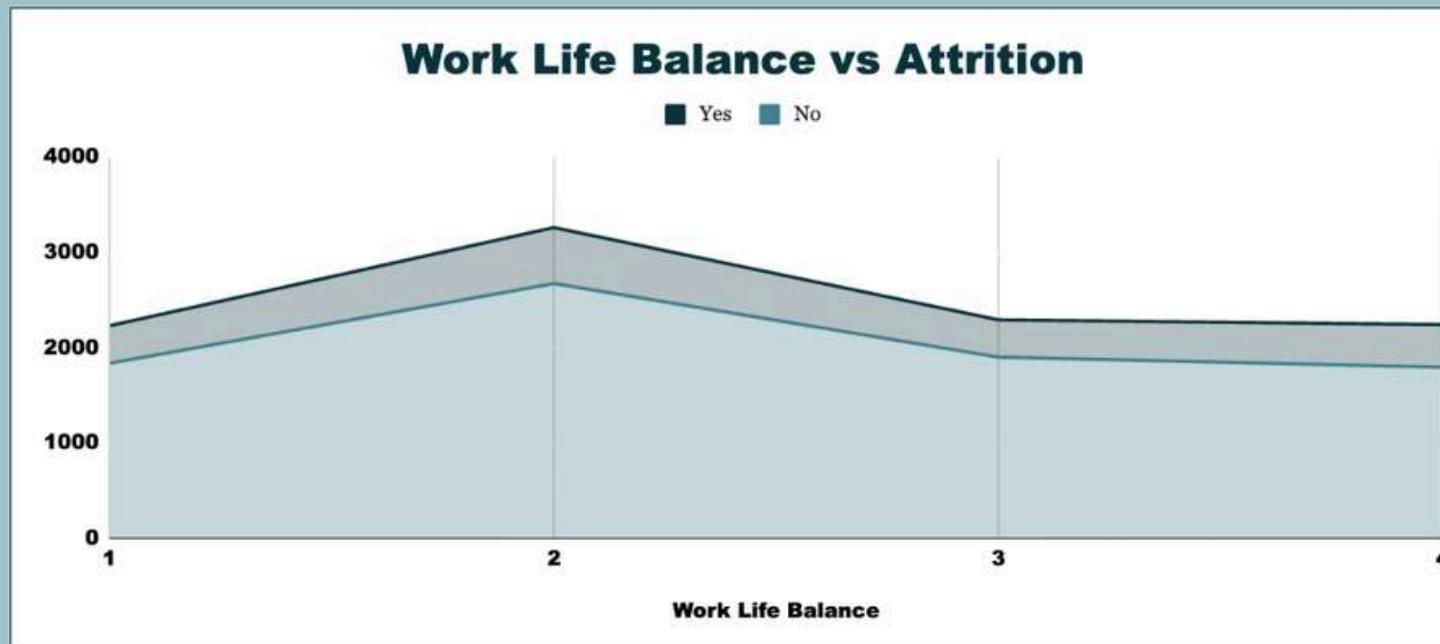


Satisfaction & Work-Life Insights

Employee Experience Patterns

- Lower Work-Life Balance → Higher exits
- Job Satisfaction impact relatively stable
- Relationship with Manager → Limited variation

SATISFACTION & WORK-LIFE INSIGHTS



"Work-life balance emerges as a stronger attrition indicator than satisfaction ratings alone."

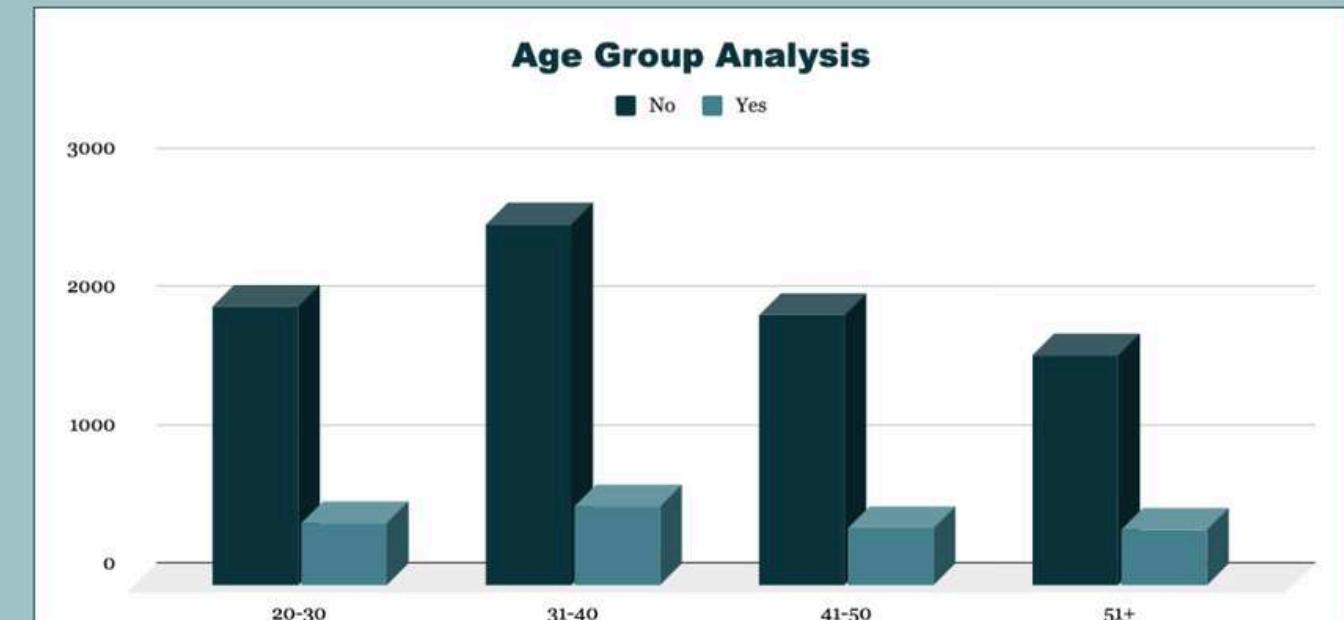
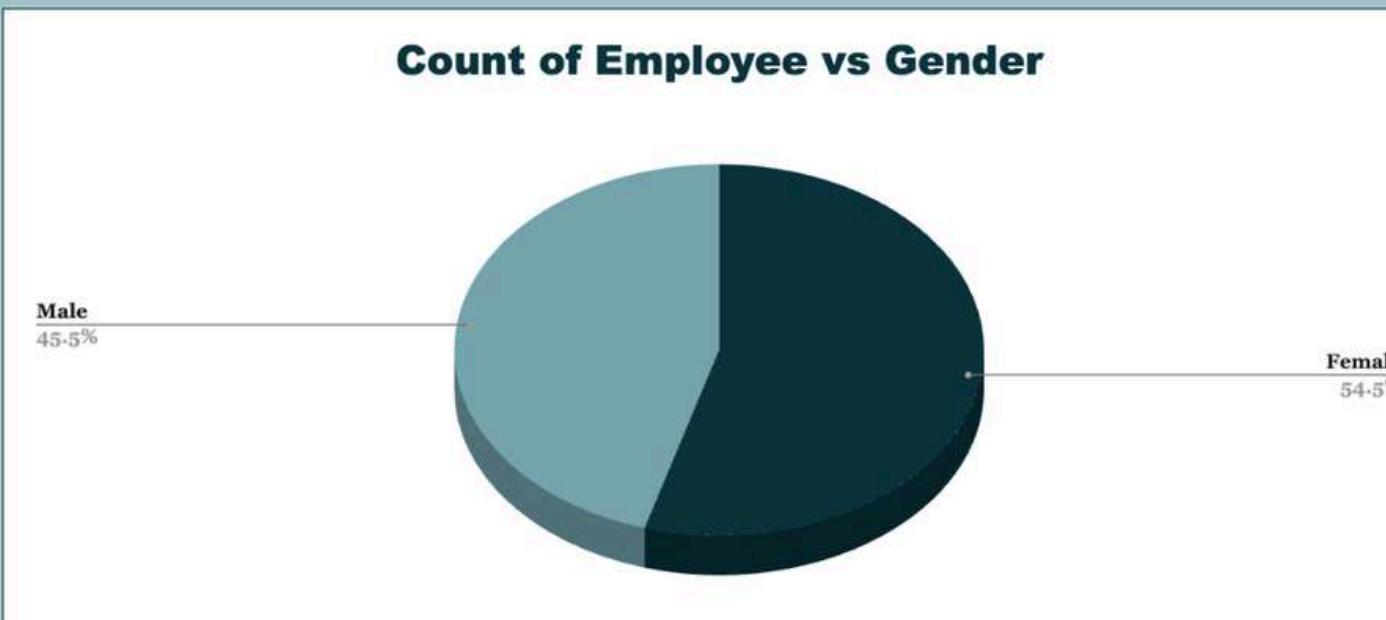


Demographic Insights

Workforce Distribution

- Gender composition relatively balanced
- Marital Status → Minor attrition variation
- Age Groups → Higher exits in mid-career bands

DEMOGRAPHICS



"Demographics show secondary influence compared to compensation and work-life factors."

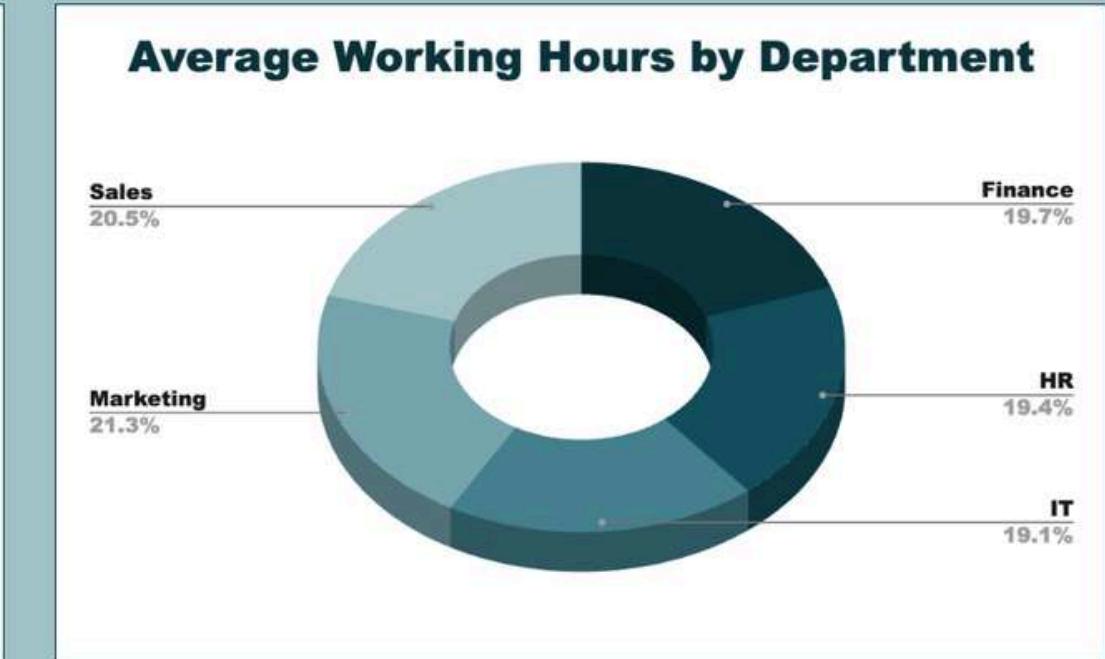


Performance & Training Insights

Performance Findings

- Attrition occurs across all performance levels
- Training hours similar across ratings
- No strong differentiation observed

PERFORMANCE & TRAINING INSIGHTS



"Performance ratings alone do not explain attrition behaviour."



Business Recommendations

Strategic Interventions

- **Target High-Attrition Departments**

Implement focused retention programs in departments showing elevated attrition (e.g., IT)

- **Correct Compensation Structure Gaps**

Review salary inconsistencies across job levels and ensure equitable pay progression

- **Enhance Work-Life Balance Policies**

Optimize workload distribution, flexible scheduling, and burnout prevention initiatives

Role-Specific Actions

- **Strengthen Engagement for Assistant / Junior Roles**

Introduce career development plans, mentoring, and skill-building pathways

- **Career Progression & Promotion Transparency**

Reduce stagnation by clarifying promotion criteria and timelines

Employee Experience Enhancements

- **Commute Support for Distant Employees**

Consider hybrid work options, transport benefits, or relocation assistance

- **Continuous Satisfaction Monitoring**

Deploy pulse surveys to detect early dissatisfaction signals



Impact & Business Value



Organizational Impact

- Identifies high-risk attrition segments across departments & roles
- Highlights compensation and work-life imbalance risks
- Enables early HR intervention strategies
- Supports evidence-based workforce planning decisions

Business Value Creation

- Potential reduction in recruitment & onboarding costs
- Improved employee retention & stability
- Enhanced productivity & team continuity
- Better compensation structure alignment
- Strengthened data-driven HR governance

Strategic Value

- Shifts HR from reactive → proactive decision-making
- Converts workforce data into actionable management insights

Strong Executive Closing Line

“By leveraging analytics, organizations can minimize preventable attrition and protect both human and financial capital.”



Limitations & Future Scope

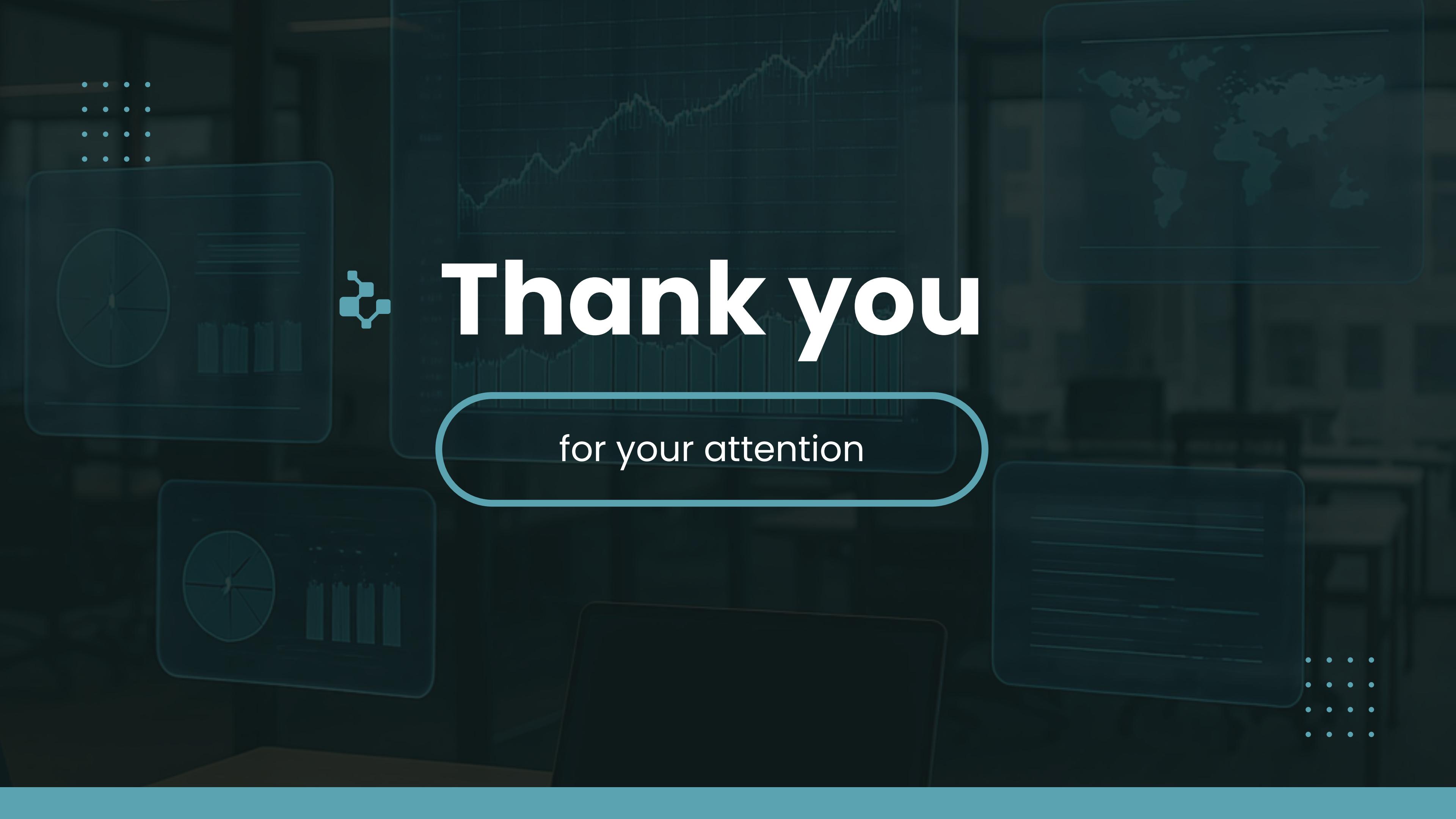
Study Limitations

- The dataset used is simulated, not derived from a live organization
- Absence of time-series / historical attrition trends
- External factors (market conditions, leadership changes, culture) not captured
- Limited behavioural or psychological variables

Future Scope / Enhancements

- Develop a predictive attrition model (Logistic Regression / ML)
- Introduce an employee attrition risk scoring system
- Integrate real HRIS / organizational data sources
- Track attrition patterns longitudinally (month/quarter/year)
- Expand analysis with engagement, performance review, and exit interview data

“While this study provides diagnostic insights, future enhancements can transform the solution into a proactive decision-support system.”



Thank you

for your attention