ATLAS LABS HR ANALYTICS WITH POWER BI

Final Project Report

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Tool Used: Microsoft Power BI
Project Type: HR Data Analysis & Visualization

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Executive Summary

This report presents a comprehensive HR analytics solution developed for Atlas Labs using Power BI, aimed at monitoring workforce dynamics and uncovering key drivers of employee attrition. The solution is built on a robust data model with a custom date dimension and active/inactive relationships to support time aware analysis. Through Power Query, HR and performance data were ingested and transformed, and a suite of validated DAX measures was created to calculate core KPIs including headcount, attrition rates, satisfaction scores, and performance metrics.

The final output consists of four interactive dashboards:

- The **Overview dashboard** provides a high-level snapshot of workforce size, hiring trends, departmental distribution, and overall attrition.

- The **Demographics dashboard** explores employee composition across age, gender, marital status, ethnicity, and salary, offering insights into diversity and equity.

- The **Performance Tracker dashboard** enables detailed analysis of individual employee satisfaction and performance trends over time, helping identify areas for development and support.

- The **Attrition dashboard** breaks down turnover by department, travel frequency, overtime, tenure, and hire date, revealing patterns and potential risk factors.

Each dashboard is dynamic and fully filterable, allowing users to drill down by employee, department, or metric to uncover deeper trends and comparisons. This flexibility empowers HR teams and leadership to make data-driven decisions, prioritize targeted interventions, and continuously monitor progress. Recommendations and validation steps are included to ensure findings are actionable and aligned with organizational goals.

Project Objectives

The primary objective of this project is to deliver a comprehensive HR analytics solution for Atlas Labs that enables leadership and HR to monitor workforce health, detect emerging attrition risks, and prioritize targeted retention actions. The analysis focuses on quantifying headcount dynamics and attrition (overall and cohort-based by hire date and tenure), tracking time-based trends, and surfacing measurable relationships between employee satisfaction dimensions (work-life balance, manager rating, job satisfaction, environment and relationship satisfaction) and turnover.

From an analytical and technical perspective, the project aims to implement a robust snowflake data model anchored on a fact table of performance ratings and supported by dimensional tables (employee, date, satisfaction and rating scales) with correctly defined active/inactive relationships for time-sliced analysis. The work includes a documented ETL pipeline in Power Query, a suite of validated DAX measures for KPIs (counts, rates, averages, and date logic), and reproducible validation steps to ensure calculations reconcile with source data. Finally, the solution must present

clear, actionable visuals across four report pages with consistent design, interactive filtering, and accessible metrics so stakeholders can quickly interpret results and take prioritized, measurable actions.

Data Sources and Pipeline

The project started by loading each CSV table into Power BI as a separate query and applying a consistent ETL process in Power Query to prepare the data for analysis. For every table the workflow enforced correct data types, trimmed and cleaned text fields, normalized and validated date columns, removed duplicates, and handled missing or inconsistent values so that aggregates and joins behave predictably.

After transforming and validating each source table to a model-ready state, a dedicated DimDate table was generated using a DAX expression to provide a contiguous calendar with calendar and fiscal year/quarter/month attributes, week bounds, and formatted labels. The cleaned tables together with the DimDate support subsequent measure development and report construction.

Data Model and Architecture

The solution uses a snowflake schema centered on a fact table of performance ratings, with supporting dimension tables for employee attributes, satisfaction and rating mappings, education, and a dedicated date table. This normalized layout keeps the fact table focused on review level records while enabling reusable lookup tables for descriptive attributes. A screenshot of the model is included to show table names, keys, and relationship directions.

Time intelligence is driven by a custom DimDate table created with DAX; the calendar spans the full range of hire and review dates and includes calendar and fiscal year, quarter, month, week bounds, and formatted labels for consistent axis and slicing across reports. The date table is the primary axis for trend analysis and cohort calculations, ensuring measures behave correctly for both calendar and fiscal reporting.

Multiple relationships were defined between date columns and the fact/employee tables to support analyses on different date fields (for example, hire date versus review date). Because Power BI allows only one active relationship between two tables, the model implements one active link and additional inactive relationships; measures use USERELATIONSHIP to activate the appropriate date context when required. This pattern prevents ambiguous filter propagation and enables precise time-sliced calculations without duplicating tables.

An empty Measures table was also created in the model to serve as a dedicated container for all DAX measures developed for the project. Placing measures in a single, purpose-built table improves organization, discoverability, and maintenance of KPI logic across the report suite.
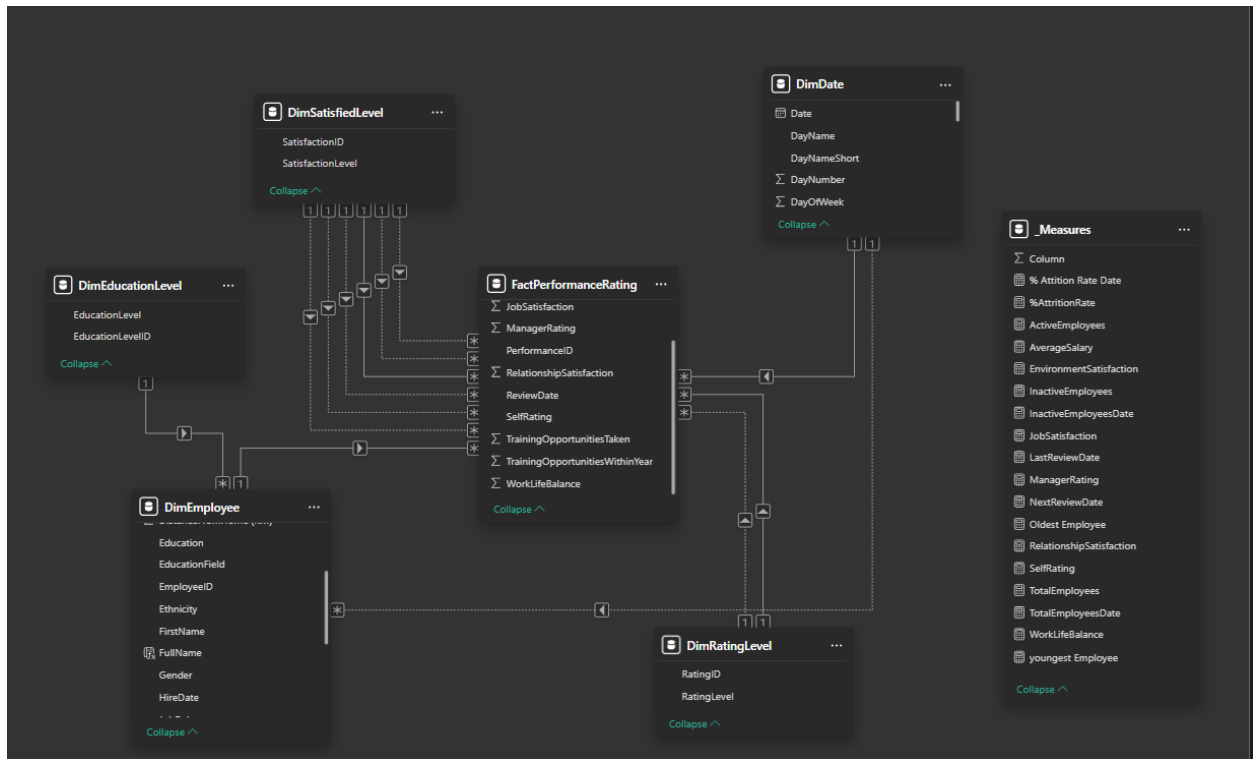
Figure 1 - Data Model

Measures, Calculations and Business Logic

A comprehensive set of DAX measures and KPIs was created to convert the cleaned data model into actionable metrics. Measures are grouped by function (Headcount & Attrition, Satisfaction, Performance, Time Intelligence, Utility) to keep related logic together and make the catalogue easy to navigate.

A separate, empty Measures table was added to hold all DAX measures. Centralizing measures in one table improves discoverability, simplifies maintenance, and helps enforce consistent naming and formatting across the model.

Below, each measure will be listed with its name, a one-line purpose, and the full DAX expression for easy reference and validation.

DAX Measures Reference Table (With Code)

Measure Name	Purpose / Business Meaning	DAX Code
TotalEmployees	Counts total number of employees.	TotalEmployees = COUNT(DimEmployee[EmployeeID])

ActiveEmployees	Counts employees currently active (Attrition = 'No').	ActiveEmployees = CALCULATE([TotalEmployees], DimEmployee[Attrition] = "No")
InactiveEmployees	Counts employees who have attrited (Attrition = 'Yes').	InactiveEmployees = CALCULATE([TotalEmployees], DimEmployee[Attrition] = "Yes")
%AttritionRate	Overall attrition percentage.	%AttritionRate = DIVIDE([InactiveEmployees], [TotalEmployees])
%Attrition Rate Date	Attrition percentage across time.	%Attrition Rate Date = DIVIDE([InactiveEmployeesDate], [TotalEmployeesDate])
InactiveEmployeesDate	Inactive employee count aligned to date table.	InactiveEmployeesDate = CALCULATE([InactiveEmployees], USERELATIONSHIP(DimEmployee[HireDate], DimDate[Date]))
TotalEmployeesDate	Total employees aligned to date table.	TotalEmployeesDate = CALCULATE([TotalEmployees], USERELATIONSHIP(DimEmployee[HireDate], DimDate[Date]))
AverageSalary	Average employee salary.	AverageSalary = AVERAGE(DimEmployee[Salary])
Oldest Employee	Maximum employee age.	Oldest Employee = MAX(DimEmployee[Age])
Youngest Employee	Minimum employee age.	Youngest Employee = MIN(DimEmployee[Age])
JobSatisfaction	Job satisfaction score.	JobSatisfaction = MAX(FactPerformanceRating[JobSatisfaction])
ManagerRating	Manager performance rating using alternate relationship.	ManagerRating = CALCULATE(MAX(FactPerformanceRating[ManagerRating]), USERELATIONSHIP(FactPerformanceRating[ManagerRating], DimRatingLevel[RatingID]))
SelfRating	Self evaluation rating.	SelfRating = CALCULATE(MAX(FactPerformanceRating[SelfRating]), USERELATIONSHIP(FactPerformanceRating[SelfRating], DimRatingLevel[RatingID]))
EnvironmentSatisfaction	Environment satisfaction rating.	EnvironmentSatisfaction = CALCULATE(MAX(FactPerformanceRating[EnvironmentSatisfaction]), USERELATIONSHIP(FactPerformanceRating[EnvironmentSatisfaction], DimSatisfiedLevel[SatisfactionID]))
RelationshipSatisfaction	Relationship satisfaction rating.	RelationshipSatisfaction = CALCULATE(MAX(FactPerformanceRating[RelationshipSatisfaction]), USERELATIONSHIP(FactPerformanceRating[RelationshipSatisfaction], DimSatisfiedLevel[SatisfactionID]))

WorkLifeBalance	Work-life balance satisfaction score.	WorkLifeBalance = CALCULATE(MAX(FactPerformanceRating[WorkLifeBalance]), USERELATIONSHIP(FactPerformanceRating[WorkLifeBalance], DimSatisfiedLevel[SatisfactionID]))
LastReviewDate	Most recent performance review date.	LastReviewDate = FORMAT(COALESCE(MAX(FactPerformanceRating[ReviewDate]), "No Review Has Happened"), "mm/dd/yyyy")
NextReviewDate	Next expected review date (+365 days after last review or hire).	NextReviewDate = FORMAT(var revieworhire = IF(MAX(FactPerformanceRating[ReviewDate]) = BLANK(), MAX(DimEmployee[HireDate]), MAX(FactPerformanceRating[ReviewDate])) return revieworhire + 365, "mm/dd/yyyy")

A dedicated DimDate table was created using a custom DAX expression to generate a contiguous calendar covering the range of hire and review dates. This table provides calendar and fiscal attributes used for all time-based analysis in the model.

DAX Code for DimDate Table:

```
DimDate =

VAR _minYear = YEAR(MIN(DimEmployee[HireDate]))

VAR _maxYear = YEAR(MAX(DimEmployee[HireDate]))

VAR _fiscalStart = 4


RETURN

ADDCOLUMNS(

    CALENDAR(

        DATE(_minYear,1,1),
```

```
            DATE(_maxYear,12,31)
),
"Year",YEAR([Date]),

"Year Start",DATE( YEAR([Date]),1,1),

"YearEnd",DATE( YEAR([Date]),12,31),


"MonthNumber",MONTH([Date]),


"MonthStart",DATE( YEAR([Date]), MONTH([Date]), 1),


"MonthEnd",EOMONTH([Date],0),

"DaysInMonth",DATEDIFF(DATE(          YEAR([Date]),          MONTH([Date]),
1),EOMONTH([Date],0),DAY)+1,


"YearMonthNumber",INT(FORMAT([Date],"YYYYMM")),


"YearMonthName",FORMAT([Date],"YYYY-MMM"),


"DayNumber",DAY([Date]),


"DayName",FORMAT([Date],"DDDD"),


"DayNameShort",FORMAT([Date],"DDD"),


"DayOfWeek",WEEKDAY([Date]),


"MonthName",FORMAT([Date],"MMMM"),
```

"MonthNameShort",FORMAT([Date],"MMM"),

"Quarter",QUARTER([Date]),

"QuarterName","Q"&FORMAT([Date],"Q"),

"YearQuarterNumber",INT(FORMAT([Date],"YYYYQ")),

"YearQuarterName",FORMAT([Date],"YYYY")&" Q"&FORMAT([Date],"Q"),

"QuarterStart",DATE(YEAR([Date]), (QUARTER([Date])*3)-2, 1),

"QuarterEnd",EOMONTH(DATE(YEAR([Date]), QUARTER([Date])*3, 1),0),

"WeekNumber",WEEKNUM([Date]),

"WeekStart", [Date]-WEEKDAY([Date])+1,

"WeekEnd",[Date]+7-WEEKDAY([Date]),

"FiscalYear",if(_fiscalStart=1,YEAR([Date]),YEAR([Date])+ QUOTIENT(MONTH([Date])+
(13-_fiscalStart),13)),

"FiscalQuarter",QUARTER(DATE(YEAR([Date]),MOD(MONTH([Date])+ (13-_fiscalStart) -
1 ,12) +1,1)),

"FiscalMonth",MOD(MONTH([Date])+ (13-_fiscalStart) -1 ,12) +1)

Report Pages and Visual Design

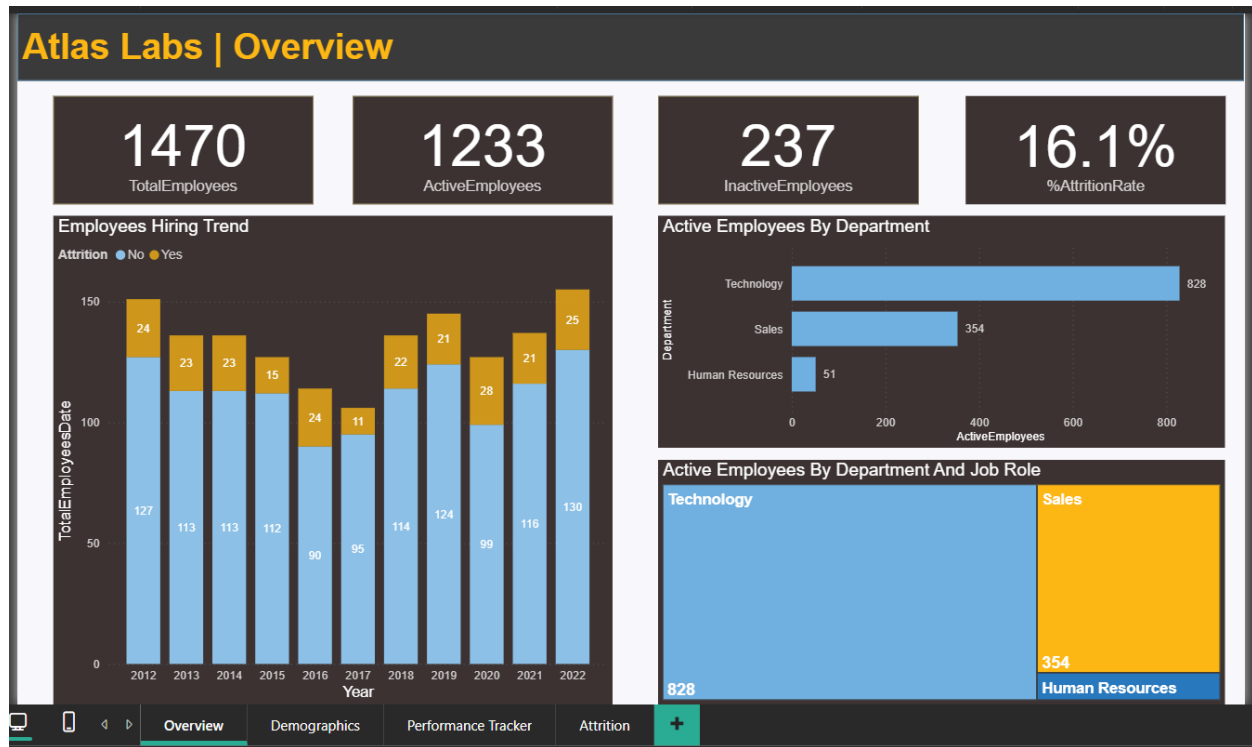## Overview Dashboard Summary

Figure 2 - Overview

The Overview Dashboard provides a high-level snapshot of Atlas Labs' workforce, offering a clear and organized view of key employee metrics and trends. At the top, four headline figures immediately set the context. The company has a total of 1,470 employees, of which 1,233 are currently active and 237 are inactive. The overall attrition rate stands at 16.1 percent, giving a quick sense of employee turnover across the organization.

On the left side of the dashboard, a bar chart tracks hiring trends over the past decade, from 2012 to 2022. In the center, a horizontal bar chart breaks down active employees by department. Technology leads by a wide margin with 828 employees, followed by Sales with 354, and Human Resources with 51. This distribution reflects the company's operational focus, with a strong emphasis on technical roles and a sizable sales force supporting business development.

To the right, a Tree map offers a more detailed look at how employees are distributed across departments and job roles. It allows the HR teams to drill down on each department and analyze the distribution of employees on each job role within the department. It reinforces the dominance of the Technology department and provides a visual comparison of staffing levels across functions. This kind of breakdown is especially useful for understanding team structures and identifying areas that may be under-resourced. It's designed to help HR teams and leadership quickly assess the

state of the workforce, monitor hiring activity, and understand how employees are spread across the organization.

Demographics Dashboard Summary

The Demographics Dashboard is designed to give a well-rounded view of Atlas Labs' workforce composition using a variety of visual elements. At the top, it starts with simple KPI cards that highlight the age range of employees, offering a quick glance at the youngest and oldest individuals in the organization. These cards set the stage for the more detailed charts that follow.

On the left side, a bar chart breaks down employees by age group, making it easy to see how the workforce is distributed across different life stages. Just below that, another bar chart shows marital status categories, helping HR teams understand personal demographics that may influence benefits or engagement strategies. These visuals are straightforward and effective for spotting trends at a glance.

To the right, a stacked bar chart combines age and gender data, showing how gender identity is distributed within each age group. This chart is particularly useful for assessing diversity across generations. At the bottom, a combination of bar and line charts displays employee counts by ethnicity alongside average salary figures, offering a dual perspective on representation and compensation. Together, these visuals create a comprehensive picture of the company's demographic landscape, supporting data-driven decisions around inclusion, equity, and workforce planning.
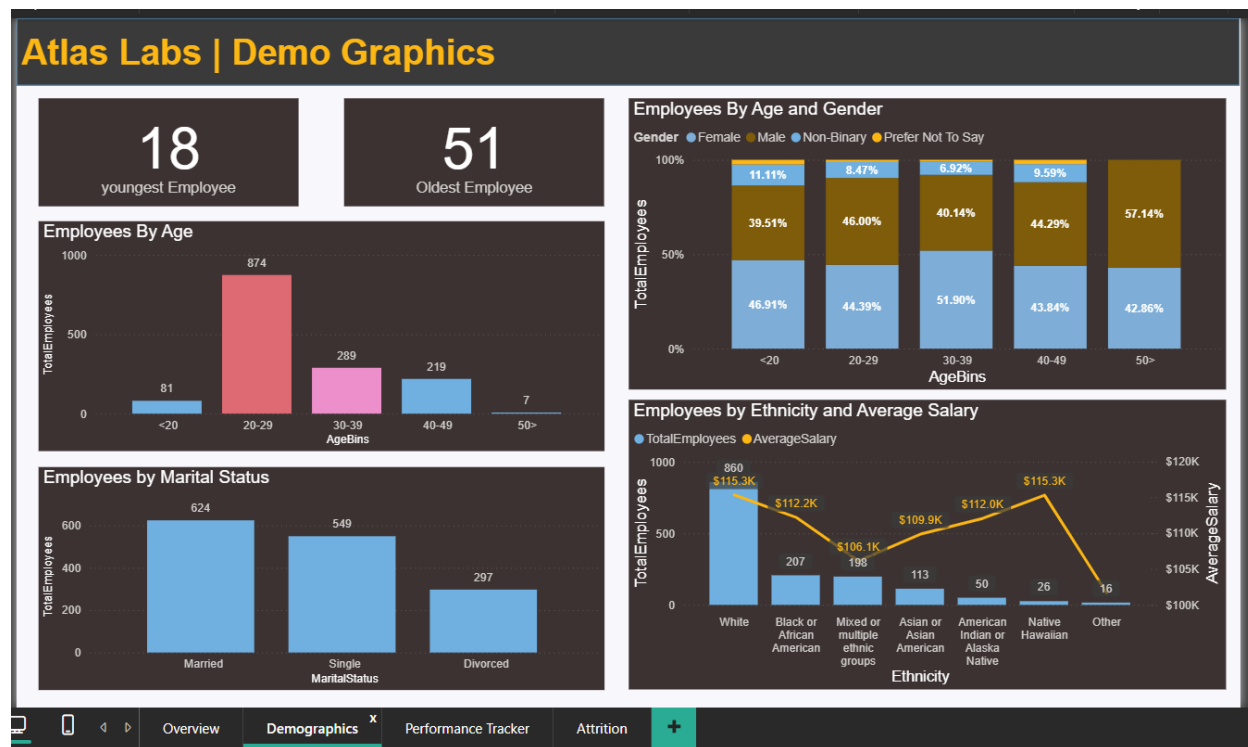

Figure 3 – Demo Graphics

Performance Tracker Dashboard Summary

The Performance Tracker Dashboard is designed to give a personalized view of an individual employee's experience and development over time. In this case, it focuses on Adrian Westhead, presenting a timeline of performance and satisfaction metrics from 2016 to 2022. Each metric such as relationship satisfaction, manager rating, work-life balance, environment satisfaction, self-rating, and job satisfaction is visualized through its own line graph. These charts help track how Adrian's experience has evolved year by year, making it easier to spot trends, improvements, or areas of concern.

On the left side of the dashboard, key dates are displayed to provide context Adrian's start date, the date of the last performance review, and the upcoming review date. This section helps HR teams stay on top of review cycles and ensures that evaluations are timely and consistent. The layout is clean and focused, allowing viewers to quickly understand the timeline and relevance of each metric.

At the bottom right, a legend explains the rating scale used across the dashboard. Each metric is scored from 1 to 5, with clear definitions ranging from "Very Dissatisfied" to "Very Satisfied" This makes the data easy to interpret and ensures consistency across different charts. Overall, the dashboard serves as a valuable tool for performance management, offering a visual summary of an employee's journey and helping guide meaningful conversations during reviews and development planning.
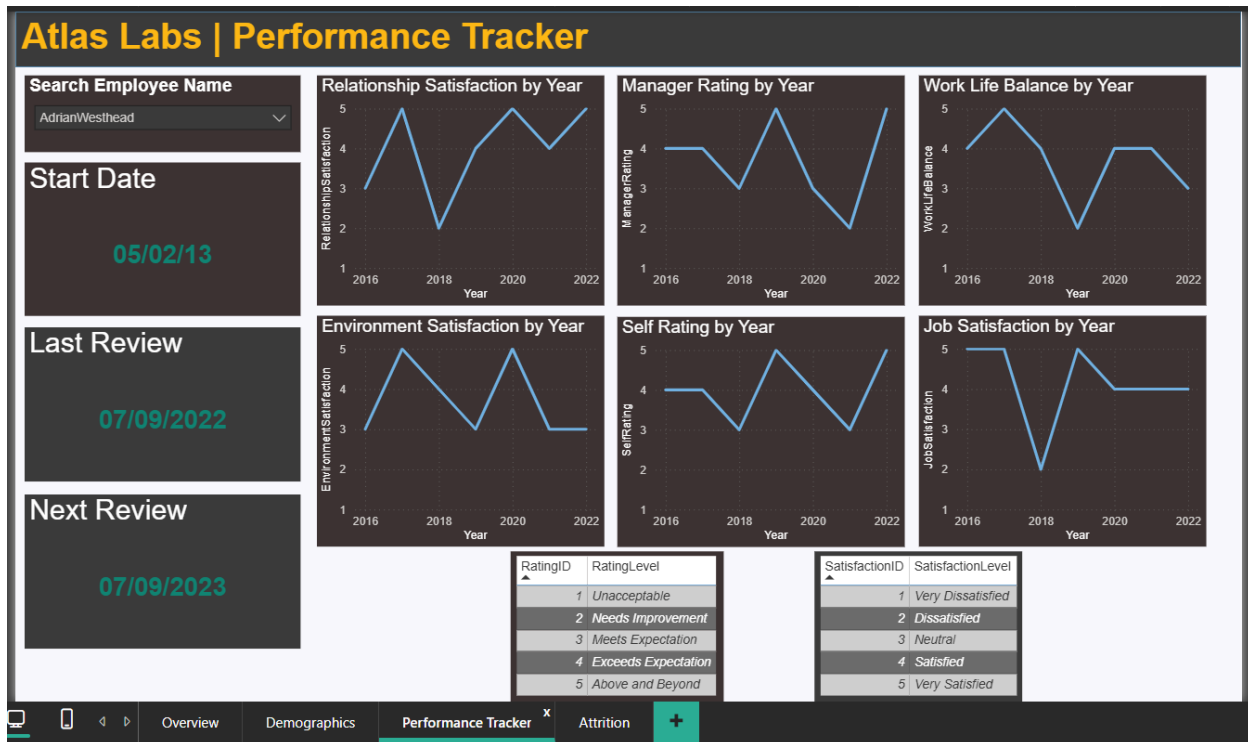

Figure 4 - Performance Tracker

Attrition Dashboard Analysis

The Attrition Dashboard gives a clear and detailed view of employee turnover at Atlas Labs. It's designed to help HR teams and company leadership understand where attrition is happening, what's driving it, and how it varies across different parts of the organization. At the top, the overall attrition rate of 16.1 percent sets the baseline for deeper analysis.

The dashboard breaks down attrition across several key areas, including department, travel frequency, overtime status, hire date, and tenure. For example, departments like Sales and Human Resources show higher turnover, which may point to challenges with workload, management, or role expectations. Travel frequency also seems to play a role, employees who travel more often tend to leave at higher rates, suggesting that travel demands could be affecting work-life balance.

One of the most striking insights comes from the overtime data. Employees who are required to work overtime have an attrition rate of 30.5 percent, compared to just 10 percent for those who don't. That's a significant gap and a clear signal that overtime may be contributing to stress and disengagement. Similarly, the tenure analysis shows that turnover is highest among new hires, with nearly 35 percent leaving in their first year. This points to possible issues with onboarding, role fit, or early career support.

The dashboard uses a mix of bar charts, line graphs, and tree map to make these insights easy to interpret. By visualizing attrition trends in a clear and interactive way, the dashboard helps decision-makers identify high-risk groups, and take action to improve retention.
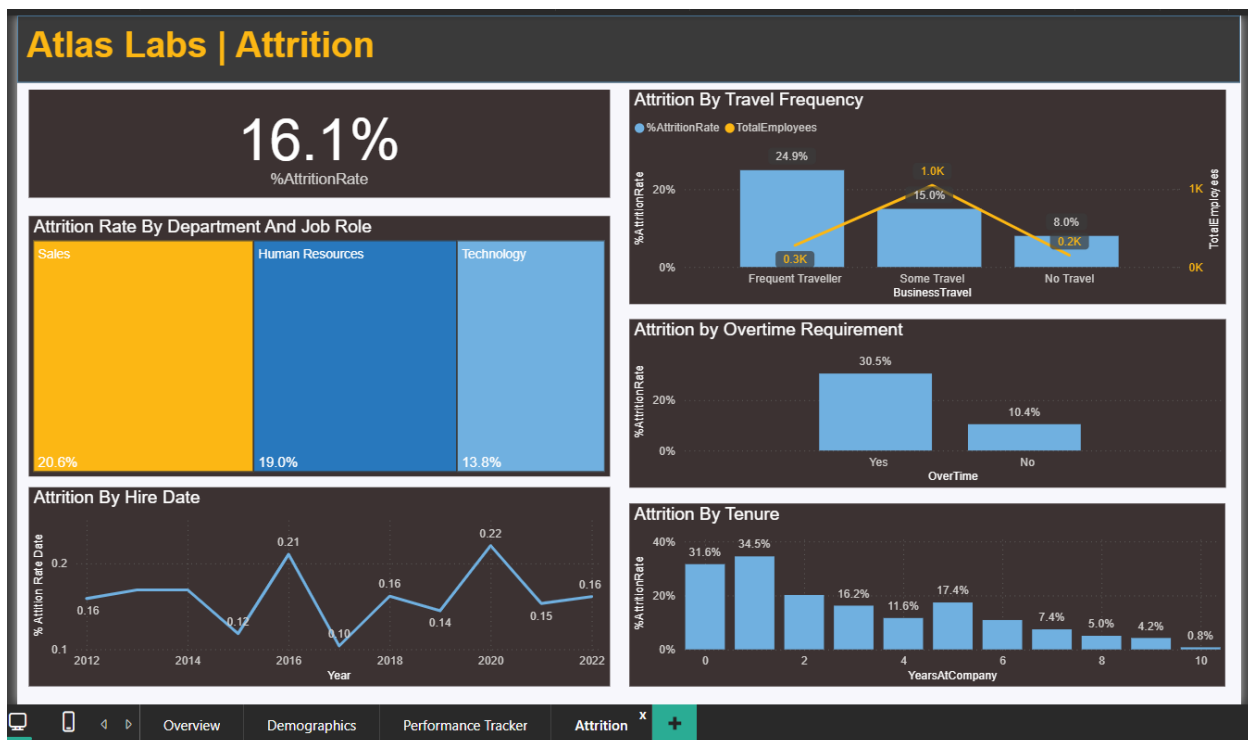

Figure 5 - Attrition

Insights and Analytical Findings

- The **Overview dashboard** revealed a stable hiring trend over the years, with a noticeable concentration of active employees in the Technology department. The overall attrition rate provided a clear snapshot of organizational turnover, helping frame retention priorities.

- The **Demographics dashboard** surfaced diversity patterns across age, gender, marital status, and ethnicity. It showed a younger workforce skew and highlighted representation across gender identities and ethnic groups, offering valuable context for inclusion and compensation strategies.

- The **Performance Tracker dashboard** enabled detailed analysis of individual employee performance and satisfaction trends over time. It helped identify fluctuations in ratings and satisfaction dimensions, which can inform personalized development plans and managerial interventions.

- The **Attrition dashboard** provided a breakdown of turnover across departments, travel frequency, overtime status, hire date, and tenure. It highlighted higher attrition in specific roles and conditions, such as frequent travel and overtime, pointing to potential stress factors or policy gaps.

Each dashboard is fully interactive and allows filtering by employee, department, time period, or specific metrics. This dynamic setup enables users to uncover deeper trends, make targeted comparisons, and explore insights tailored to any variable of interest.

Recommendations and Action Plan

This section outlines key recommendations based on the insights derived from the dashboards, along with suggested actions to improve workforce outcomes. The goal is to translate analytical findings into practical steps that support retention, performance, and diversity goals.

Recommendations may include:

- Addressing high attrition areas by reviewing workload, travel policies, or overtime expectations.

- Enhancing employee engagement through targeted programs based on satisfaction trends.

- Strengthening diversity and inclusion efforts by monitoring demographic representation and compensation equity.

- Supporting performance development with personalized feedback and training aligned to review trends.

Each recommendation is paired with an actionable step, responsible stakeholders, and suggested timelines to ensure follow-through and measurable impact. This section bridges data with decision making and sets the foundation for continuous improvement.