Data and Artificial Intelligence

Cyber Shujaa Program

Week 5 Assignment

Data Visualization using Tableau
HR Analytics Dashboard Project

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Introduction

This Document Presents an interactive Human Resource (HR) dashboard developed using Tableau. The aim of the project is to deliver high- level insights and in-depth analysis for HR decision-makers. The dashboard provides an overview of hiring of hiring trends, employee demographics, departmental data, income distributions and performance metrics.

Objectives:

- Load, clean, and transform HR data
- Create Calculated measures
- Build interactive visualizations i.e. bar charts, heatmaps, pie chart, scatter plot
- Publish the dashboard on Tableau Public

Summary view

The summary should be dived into three main sections: Overview, Demographics and Income Analysis

Overview

The Overview section should provide insights of the overall HR metrics, including:

- Display the total number of hired employees, active employees, and terminated employees.
- Visualize the total number of hired and terminated employees over the years.
- Present a breakdown of total employees by department and job titles.
- Compare total employees between headquarters (HQ) and branches (New York is the HQ)
- Show the distribution of employees by city and state.

Demographics

The demographics section should offer insights into the composition of the workforce, including:

- Present the gender ratio in the company.
- Visualize the distribution of employees across age groups and education levels.
- Show the total number of employees within each age group.
- Show the total number of employees within each education level.
- Present the correlation between employees' educational backgrounds and their performance ratings.

Income

The income analysis section should focus on salary-related metrics, including:

- Compare salaries across different education levels for both genders to identify any discrepancies or patterns.
- Present how the age correlate with the salary for employees in each department.

Employee Records View

- Provide a comprehensive list of all employees with necessary information such as name, department, position, gender, age, education, and salary.
- Users should be able to filter the list based on any of the available columns.

Tasks Completed

1. Data Loading and Transformation

The dataset was loaded into Tableau and cleaned to ensure consistency in columns such as age, Education, department, and income. Categorical columns were standardized and missing or incorrect data points were handled through basic filtering and data type correction.

The Project data used in this HR Dashboard project is generated using a combination of ChatGPT prompts and the Python faker library.

Icons and Images Used in HR Dashboard are sourced from Flaticon and customized using Photopea to match the dashboard's color scheme.

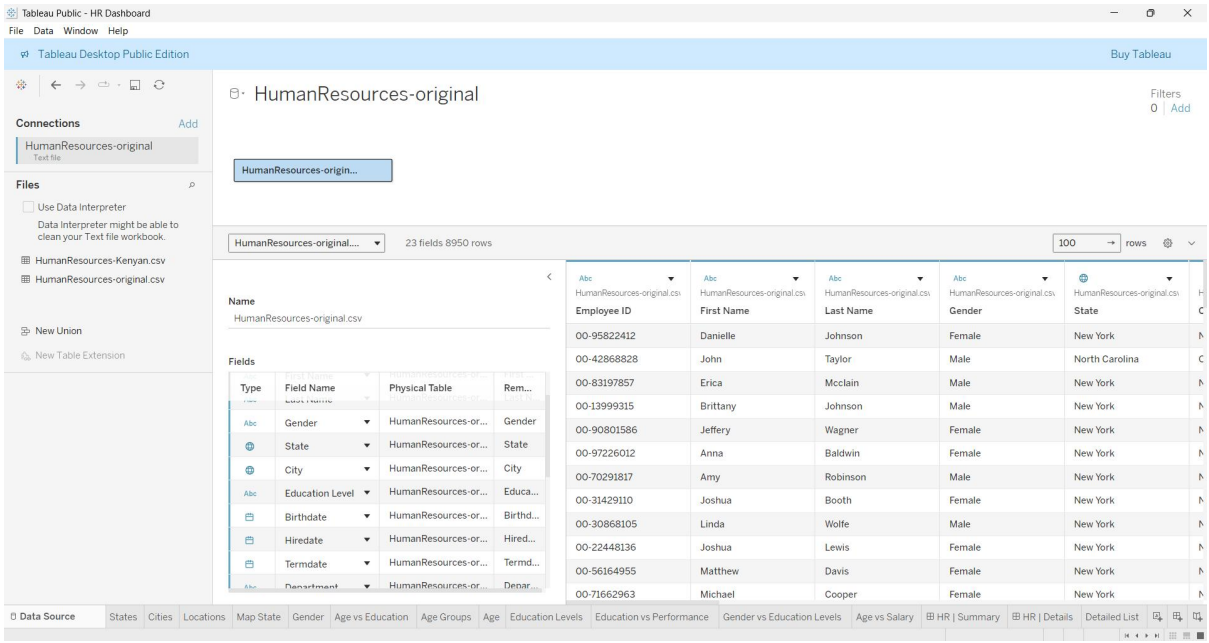

Figure 1: Data loading into tableau

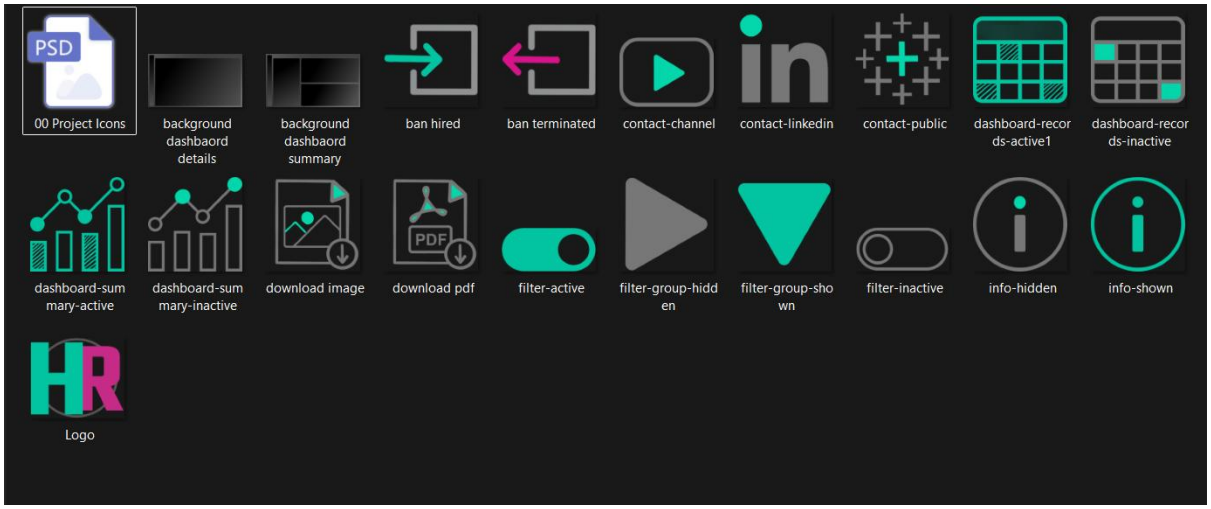

Figure 1.1: summary of icons and images used in HR Dashboard

2. Calculated measures

Calculated fields were created to compute Active Employees (Hired – Terminated), age groups, average salaries per education level, and gender-based salary distribution. These KPIs supports advanced visual filtering and drill-down capabilities in the dashboard.

Created a calculated measure called “FullName”

[First Name] + ' ' + [Last Name]

Created a calculated measure called “Total Hired”

COUNT([Employee ID])

Created a calculated measure called “%Total Hired”

[Total Hired] / TOTAL([Total Hired])

Created a calculated measure called “Total Terminated”

COUNT(IF NOT ISNULL([Termdate]) THEN [Employee ID] END)

Created a calculated measure called “%Total Terminated”

[Total Terminated] / TOTAL([Total Terminated])

Created a calculated measure called “Active”

COUNT(IF ISNULL([Termdate]) THEN [Employee ID] END)

Created a calculated measure called “Location”

```
CASE [State]
    WHEN 'New York' THEN 'HQ'
    ELSE 'Branch'
END
```

Created a calculated measure called “Age Group”

IF [Age] < 25 THEN '>25'

ELSEIF [Age] >=25 AND [Age] < 35 THEN '25-34'
ELSEIF [Age] >=35 AND [Age] < 45 THEN '35-44'
ELSEIF [Age] >=45 AND [Age] < 55 THEN '45-54'
ELSEIF [Age] >=55 THEN '55+'
END

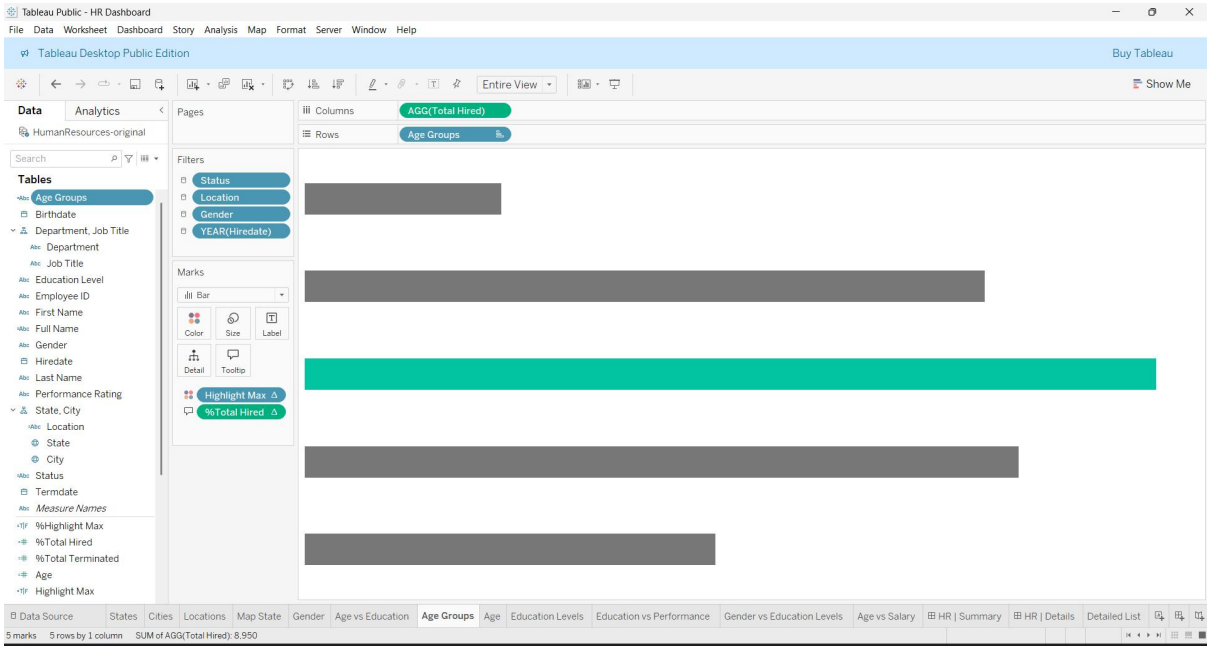

Figure 2: Age Group calculated field

Created a calculated measure called “Age”

DATEDIFF('year', [Birthdate], TODAY())

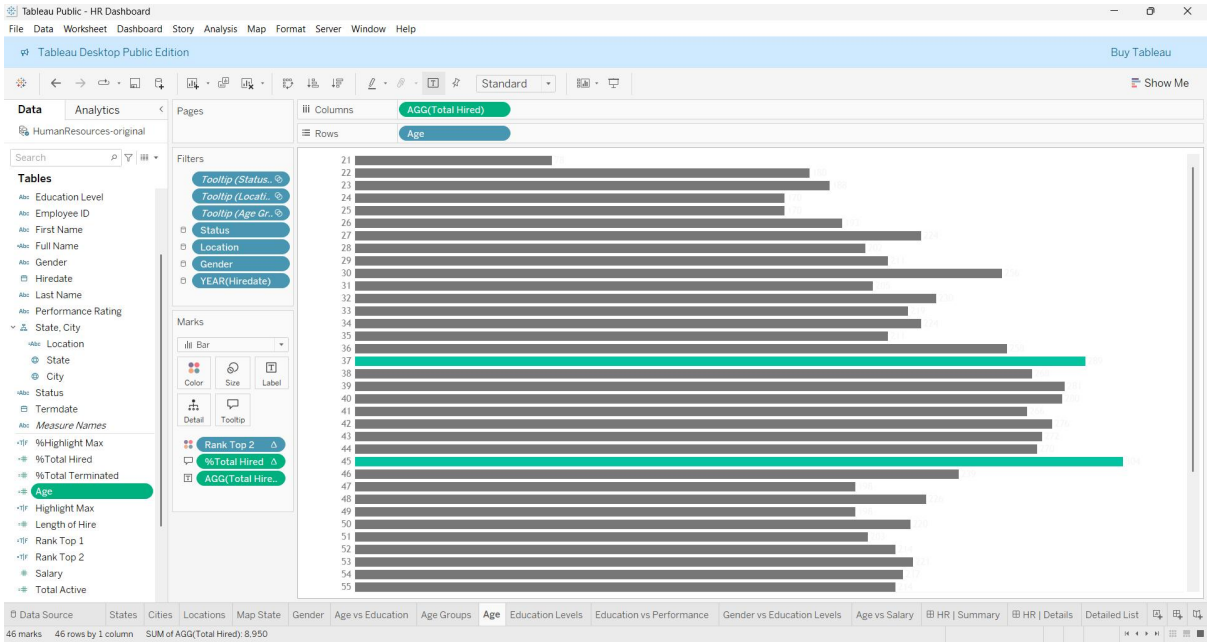

Figure 2.1: Calculated field called Age

Created a calculated measure called “Status”

IF ISNULL([Termdate]) THEN 'Hired'
ELSE 'Terminated'
END

Created a calculated measure called “Highlight Max”
WINDOW_MAX([Total Hired]) = [Total Hired]

Created a calculated measure called “%Highlight Max”
WINDOW_MAX([%Total Hired]) = [%Total Hired]

Created a calculated measure called “Rank Top 1”
RANK([%Total Hired]) <= 1

Created a calculated measure called “Rank Top 2”
RANK([%Total Hired]) <= 2

Created a calculated measure called “Length of Hire”
IF ISNULL([Termdate])
THEN DATEDIFF('year', [Hiredate], TODAY())
ELSE DATEDIFF('year', [Hiredate], [Termdate])
END

3. Visualizations

- Bar chart for Job Titles

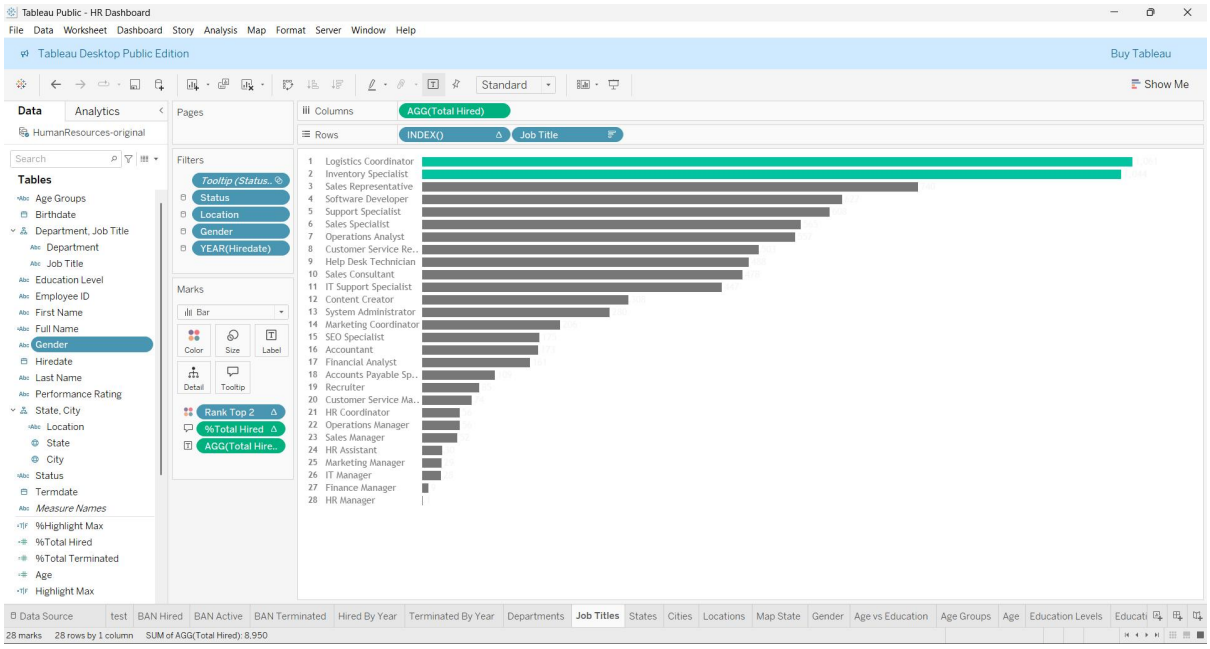

Figure 3: Bar chart for Job Titles

- Bar chart for States

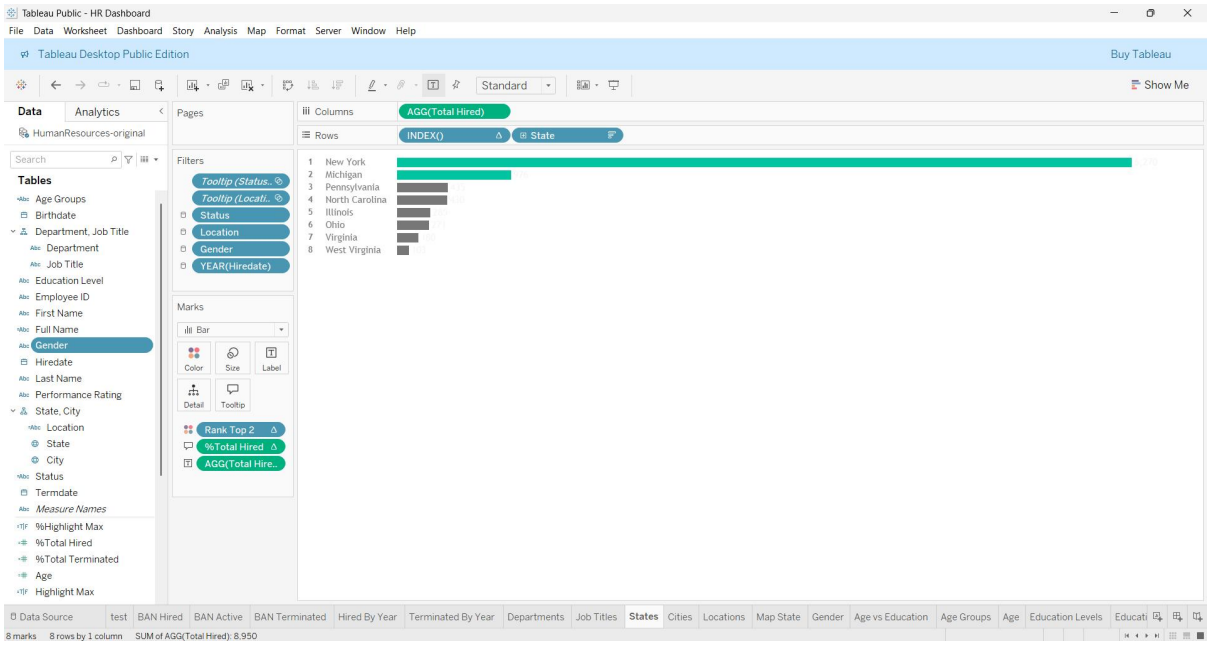

Figure 3.1: Bar chart for states

- Bar chart for cities

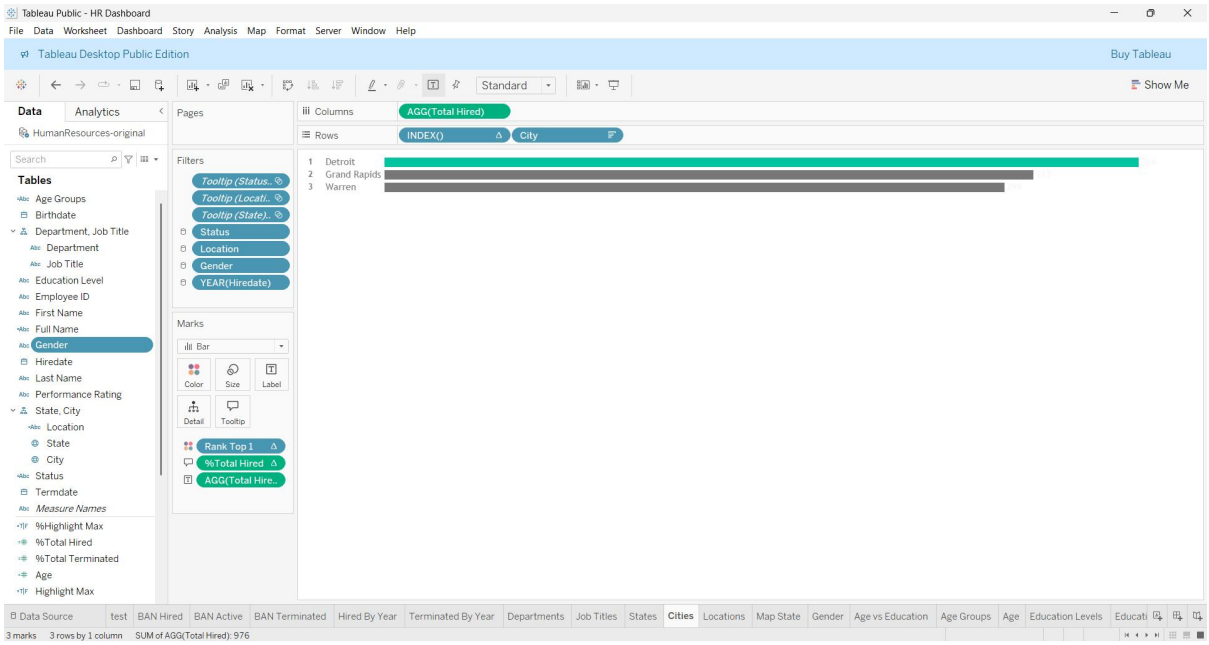

Figure 3.2: Bar chart for Cities

- Bar chart for Location

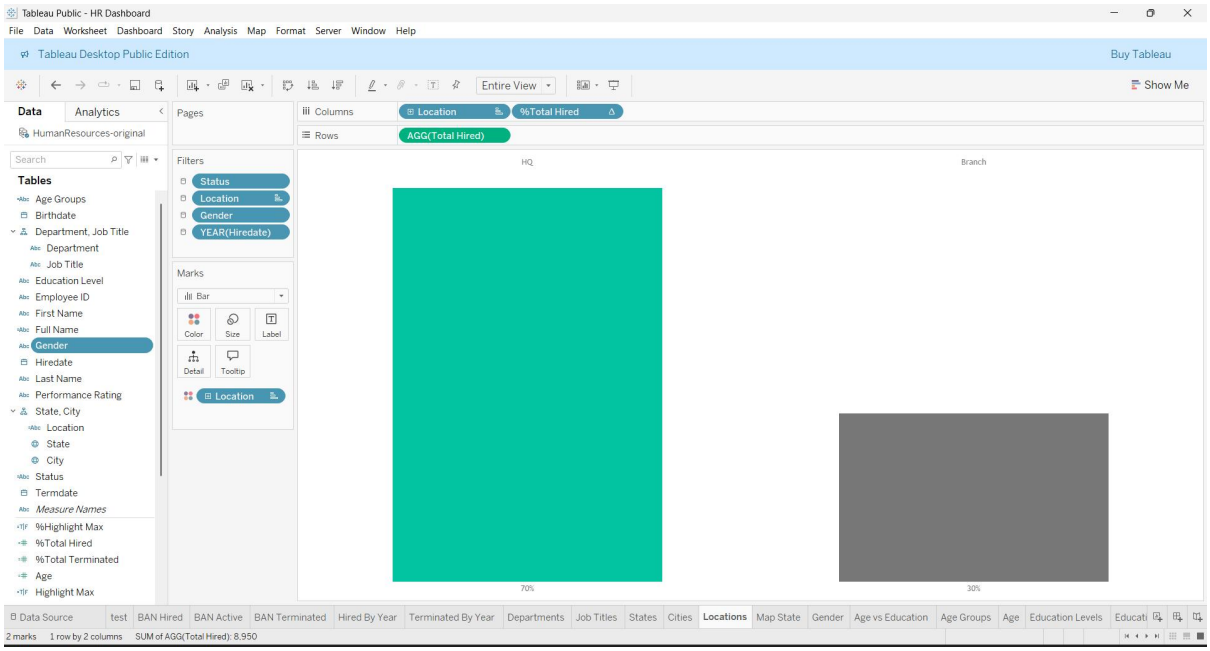

Figure 3.3: Bar chart for location

- Bar chart for Age Groups

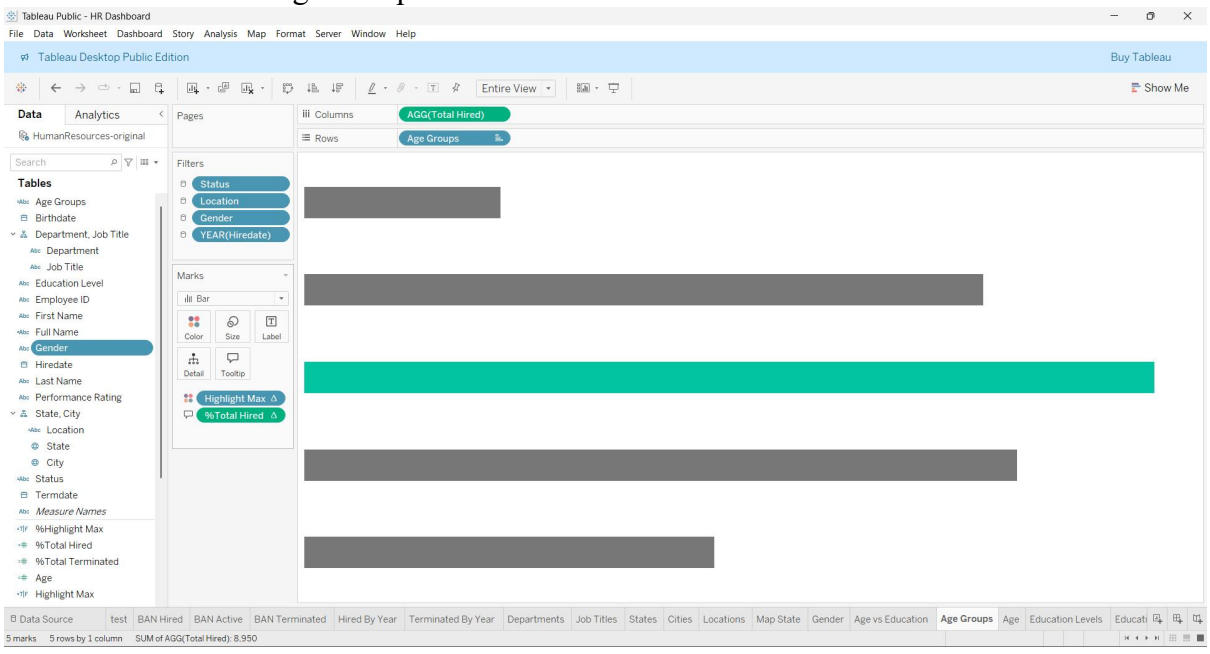

Figure 3.4: Bar chart for Age groups

- Bar chart for Age

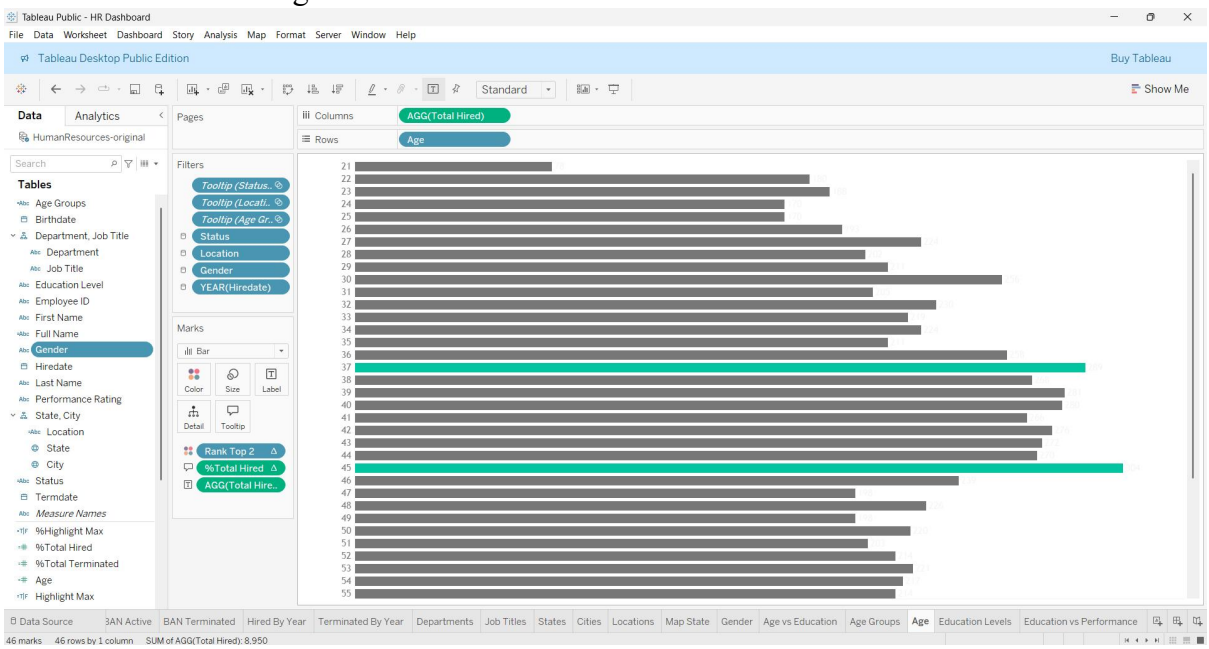

Figure 3.5: Bar chart for Age

- Bar chart for Education

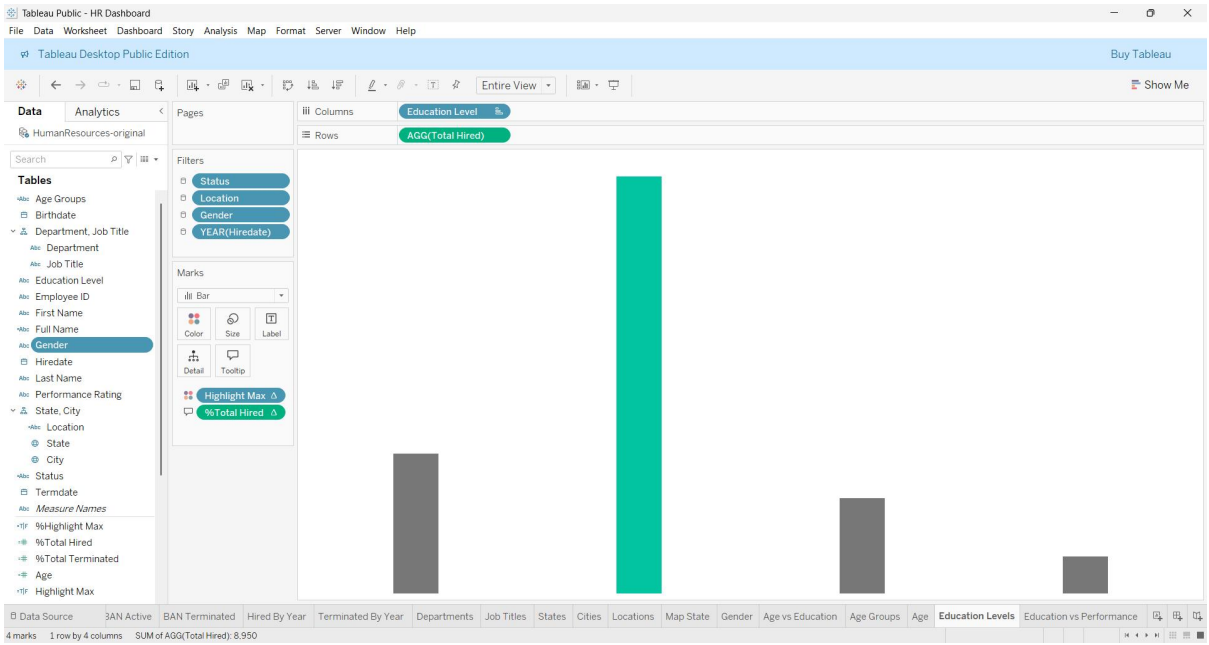

Figure 3.6: Education Levels

- Area chart for Hiring and Termination Trends

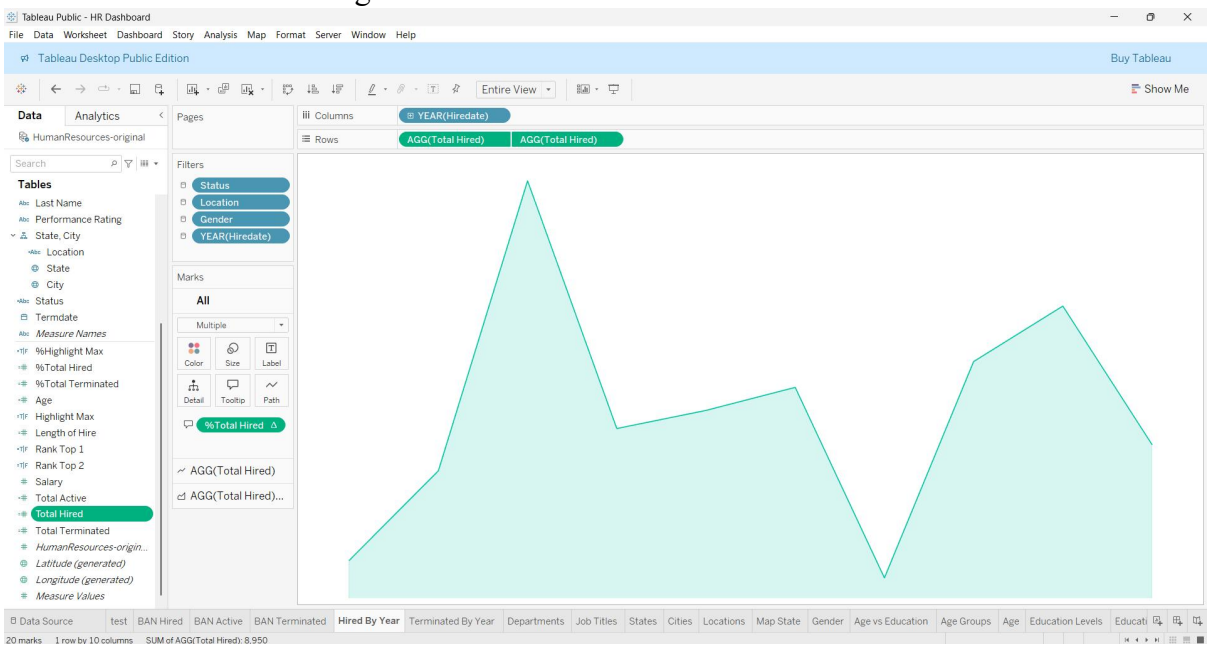

Figure 3.7: Hired by Year

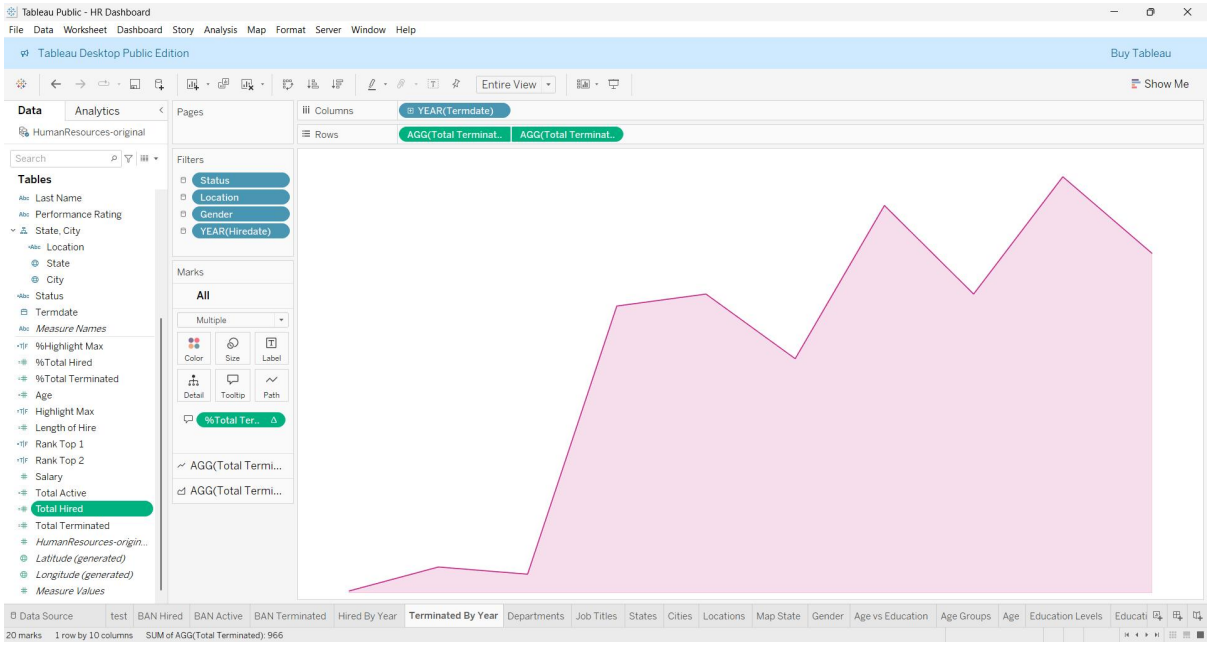

Figure 3.8: Terminated by Year

- Bar charts for departmental breakdown

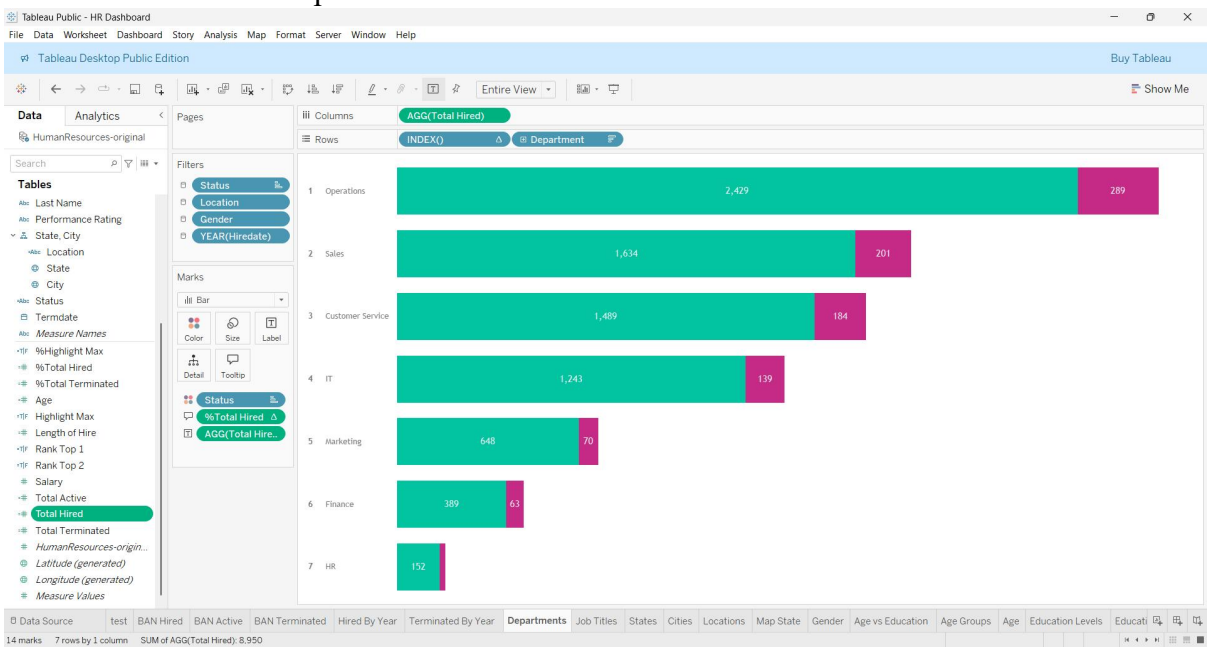

Figure 3.9: Bar chat for departments

- Maps to display geographical distribution of employees

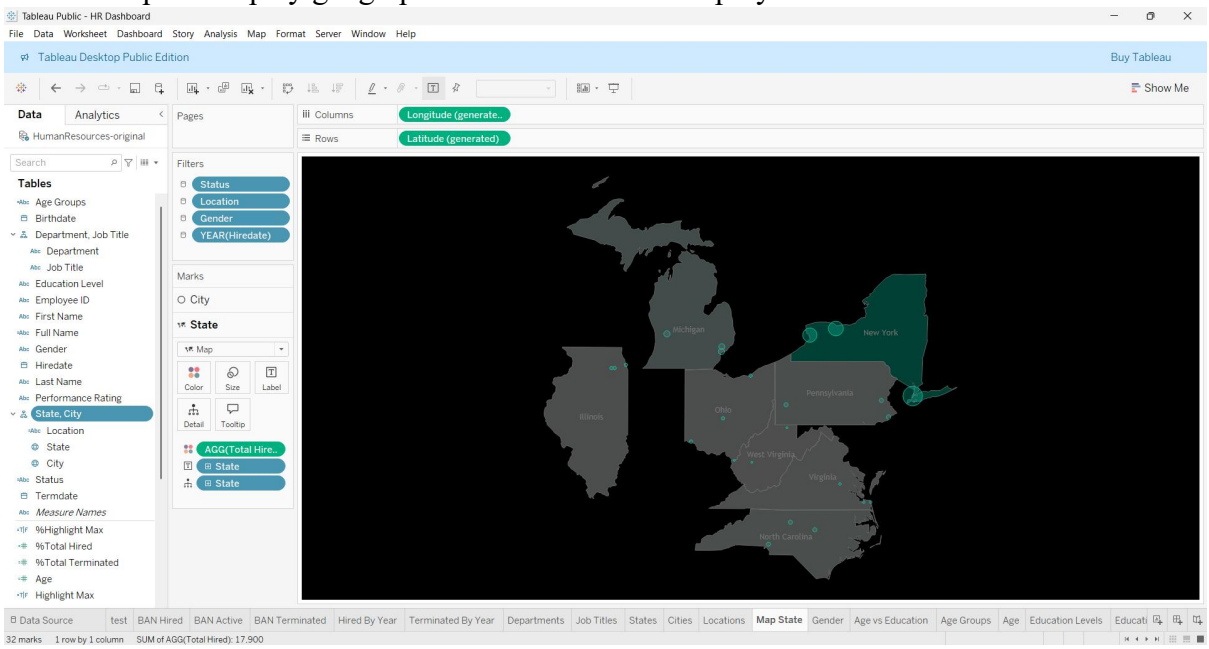

Figure 3.10: Maps displaying geographical distribution of employees

- Donut charts for gender demographics

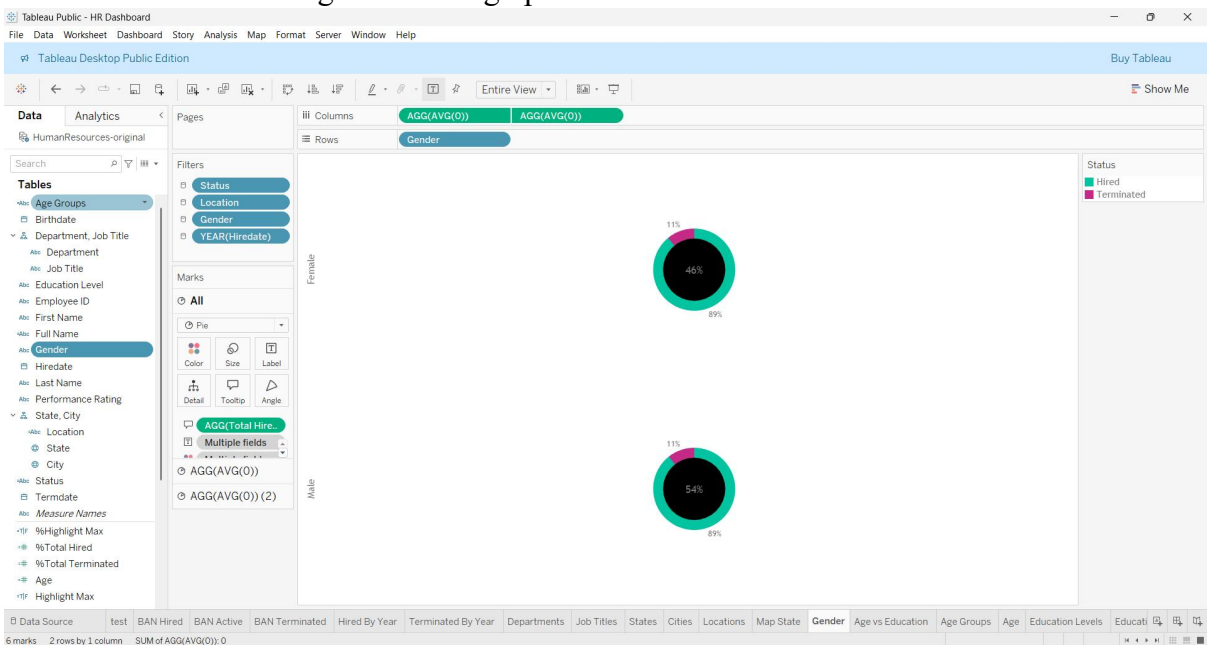

Figure 3.11: donut/pie chart for gender demographics

- Scatter plot for Age vs Salary comparison

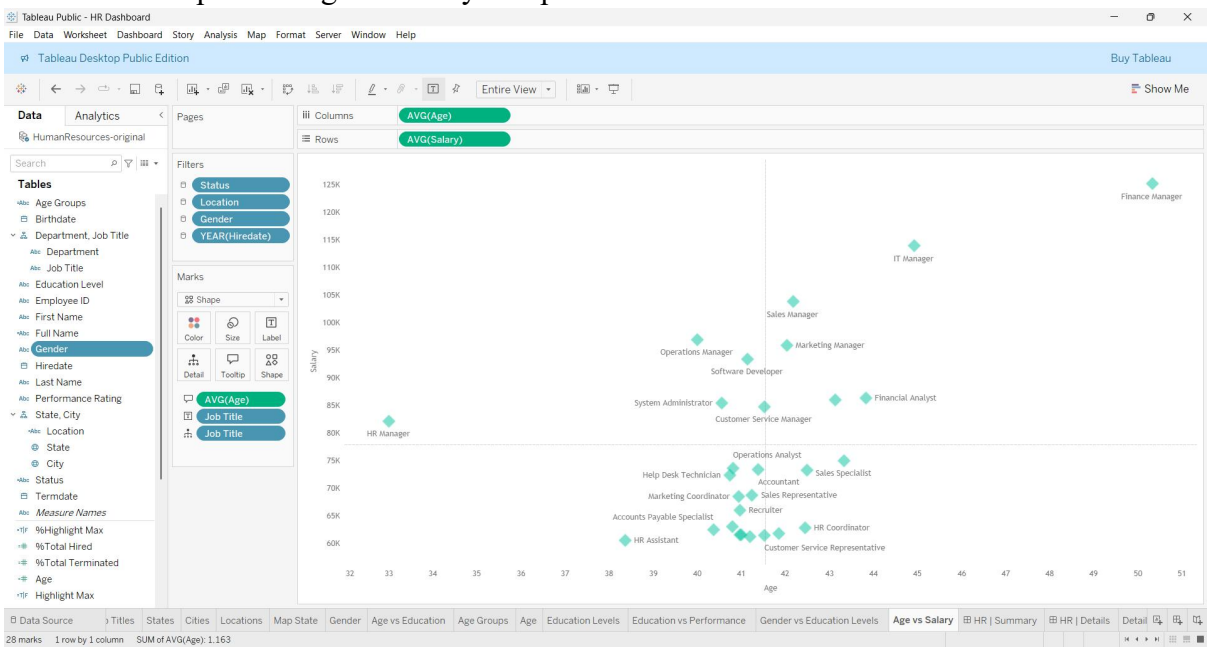

Figure 3.12: Scatter plot for Age vs Salary

- Bullet graphs for Age and Education

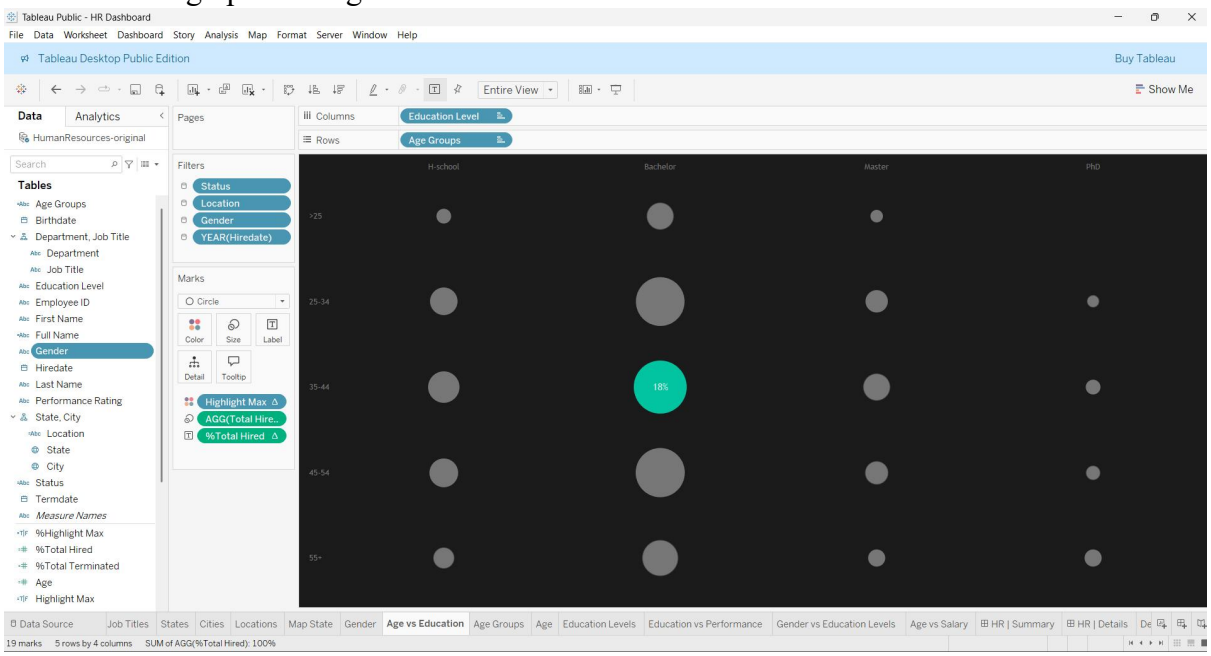

Figure 3.13: Age vs Education

- Barbell chart for Gender vs Education Levels

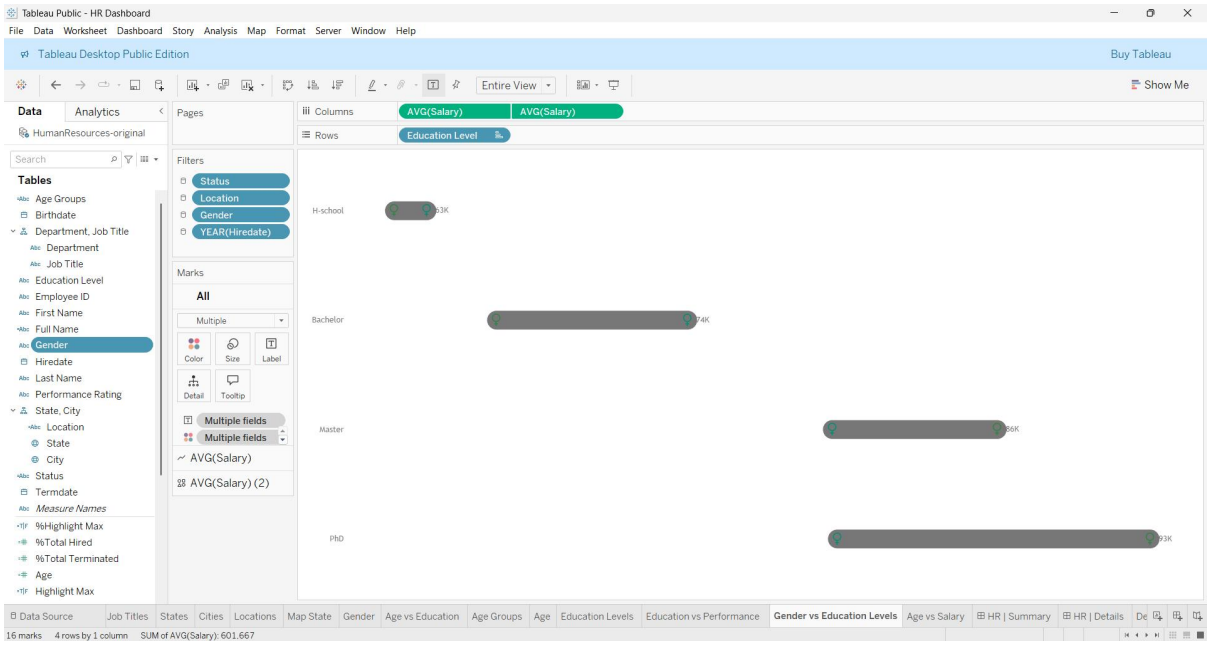

Figure 3.14: Gender vs Education Levels

- Heatmap for Education vs Performance

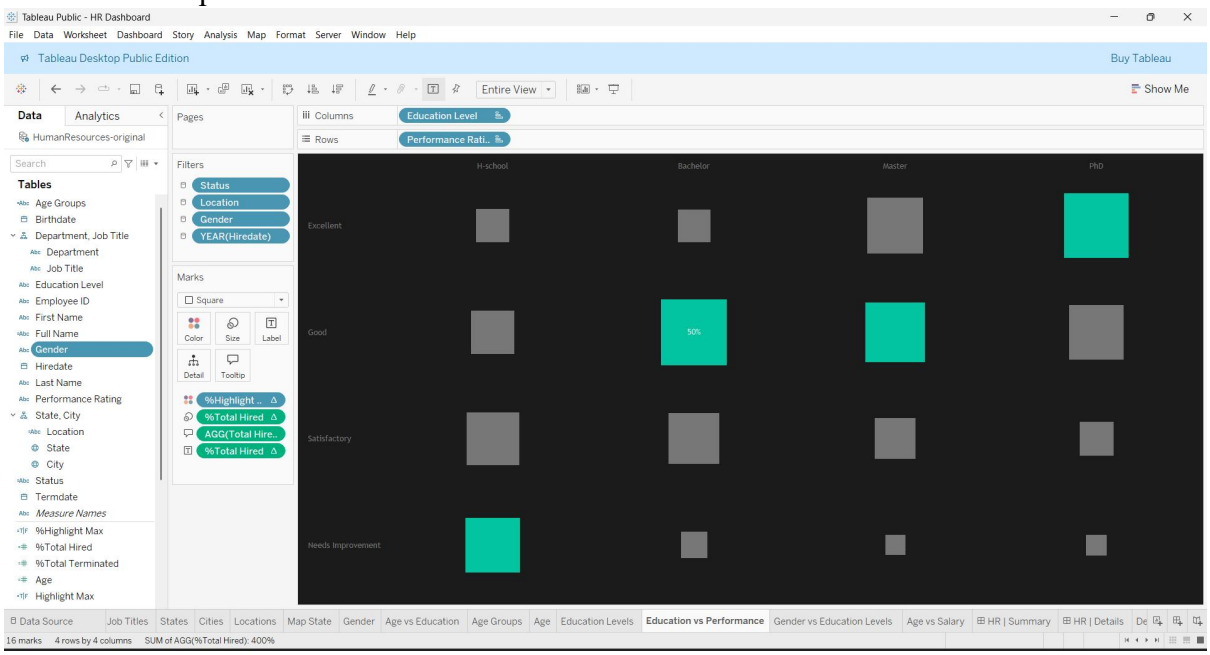

Figure 3.15: Heatmap for Education vs Performance

- *Detailed List showing employees records*

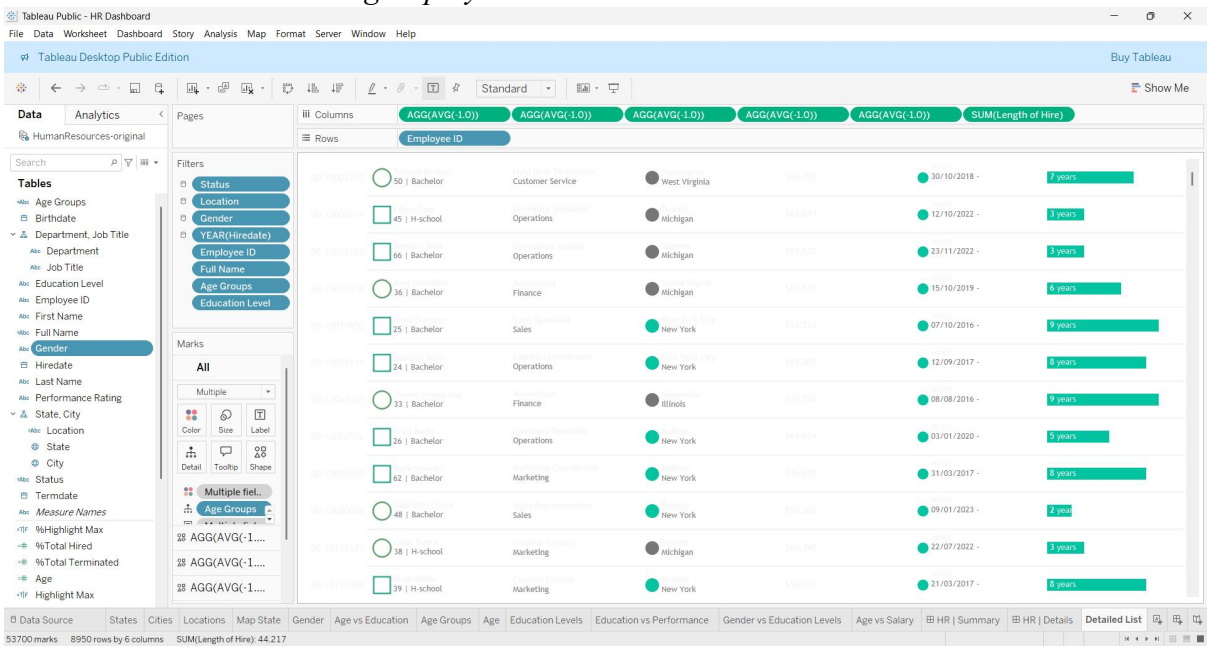

Figure 3.16: detailed list showing employee records

4. Dashboard Design

The final dashboard was structured into three main sections:

- Overview section shows hiring, termination and active employee summary.
- Demographics section covers, age and education.
- Income Analysis Section explores salary against education and gender

Each section includes interactive filters and clean design to allow users to focus on key metrics. Tooltips and labels were optimized for readability and Professional presentation.

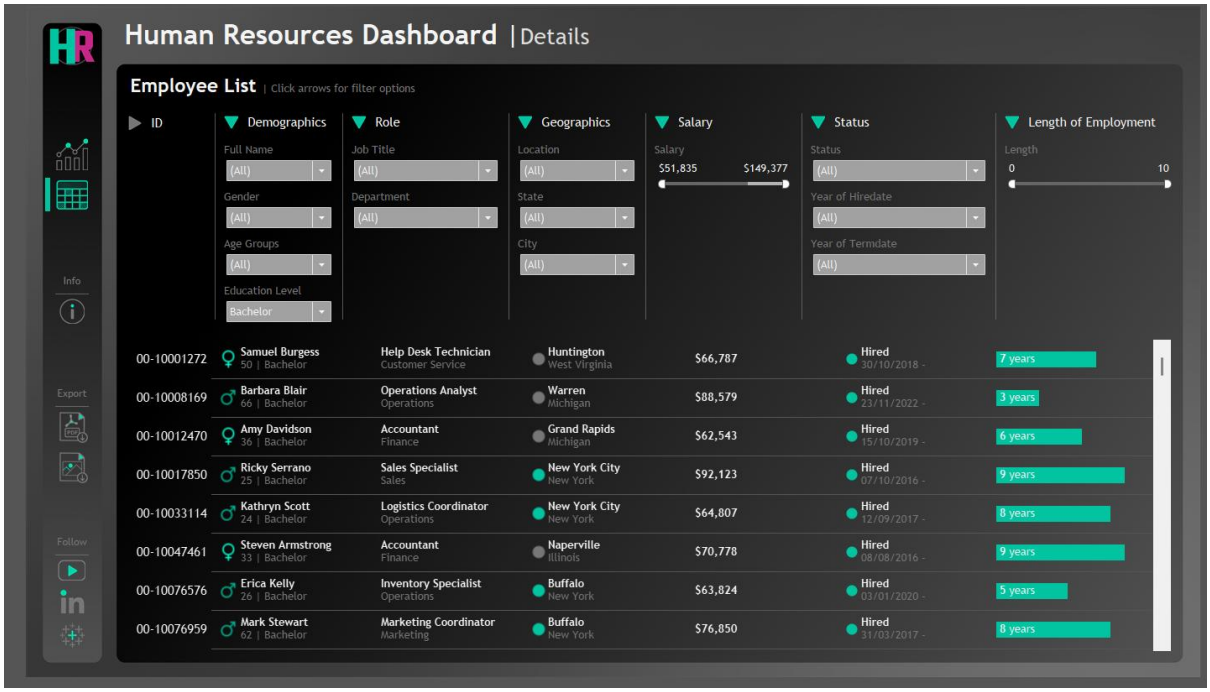

Figure 4: Employee records view

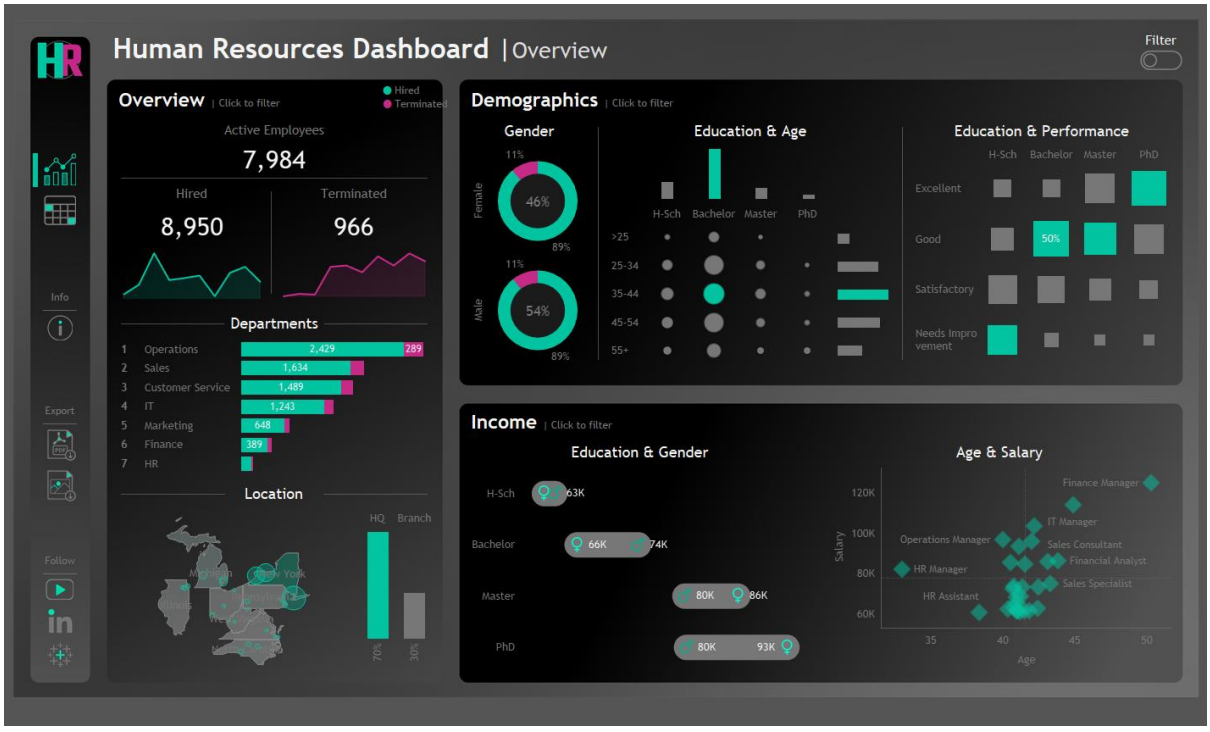

Figure 4.1: HR summary Dashboard

5. Publishing

Dashboard published to Tableau Public.

Link to Code:

Tableau Dashboard Link:
https://public.tableau.com/views/HRDashboard_17503275393430/HRSummary?:language=en-GB&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Tableau dashboard Google drive Link: https://drive.google.com/file/d/1SvwriyUEz2-MkaYsZRLn26yH0OHtBQXe/view?usp=sharing

Tableau Dashboard repo Link: https://github.com/Jb-rown/HR-Dashboard-Analysis.git

Conclusion

This project provided valuable experience in data visualization using Tableau. The HR Dashboard created offers both summary insights and detailed analytics, enabling HR mangers to make data-driven decisions on hiring, demographics, performance, and compensation.

Key skills demonstrated includes data transformation, calculated measures, charts selection and iterative dashboard design.

Future enhancements could be predictive analytics for attrition risk.

Tableau Dashboard Link:
https://public.tableau.com/views/HRDashboard_17503275393430/HRSummary?:language=en-GB&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Tableau dashboard Google drive Link: https://drive.google.com/file/d/1SvwriyUEz2-MkaYsZRLn26yH0OHtBQXe/view?usp=sharing

Tableau Dashboard repo Link: https://github.com/Jb-rown/HR-Dashboard-Analysis.git