Data and Artificial Intelligence
Cyber Shujaa Program

Week 5 Assignment
Data Visualization using Tableau

Student Name: Denis Kombe

Student ID: CS-DA01-25094

Table of Contents

Introduction

In week 5 I came up with a tableau dashboard. This assignment provided an opportunity to gain practical experience in handling real-world data from understanding the business context and client needs to preparing, transforming and analyzing the data using Tableau. The assignment focused on developing key skills in calculated measure creation and data visualization, all tailored to address strategic business questions and uncover meaningful trends.

As part of this assignment, I designed and published an interactive dashboard that offers a comprehensive view of the data through various visualizations including bar charts, area charts, scatter plots, maps and heat maps. The dashboard not only highlights key insights but also supports data-driven decision-making. This project has been added in my portfolio website to showcase my analytical skills and ability to communicate complex data in a clear impactful way.

Objectives

The objectives of the assignment were:

1. Understanding the business and client needs.

2. Loading the Data.

3. Transforming the Data.

4. Creating calculated measures.

5. Creating a Visualization Dashboard.

6. Link to dashboard.

7. Publishing the project on my portfolio website.

Tasks Completed

Step 1: Understanding the Business and client's needs

The HR dashboard provides a clear and structured view of key workforce metrics across three main areas: **Overview, Demographics, and Income Analysis.**

- **The Overview** section highlights total counts of hired, active, and terminated employees, with visual trends over the years for hires and terminations. It breaks down employee numbers by department and job title, compares headcount between the Nairobi headquarters and branch locations, and maps employee distribution by city and state, offering a quick understanding of workforce spread and organizational structure.
- **In the Demographics section,** the dashboard outlines gender ratios, age groups, and education levels, showing not just totals but also how these attributes intersect. It tracks the number of employees in each age and education category and explores the relationship between education level and performance ratings.
- **The Income Analysis** further drills into salary data, comparing pay across education levels for men and women to detect disparities. It also analyzes how salary trends vary with age across departments, providing context for pay structure and progression throughout the company.

Step 2: Loading the Data.

After identifying the client's needs, the next step was to load the data into Tableau.

Since all the data was stored in a single file *"HumanResources-Kenyan.csv"*, the process was straightforward. I opened Tableau, selected Text File, and imported the dataset directly.

Once loaded, the data was ready for cleaning, analysis, and visualization.

Step 3: Transforming the Data.

Since the dataset was just a single file, there was no need to build a data model. Therefore, no relationships, joins, or unions were required in this part.

Next, I checked the data quality to ensure there were no missing values, duplicates, or inconsistencies that could affect the analysis. Any minor issues were addressed to keep the dataset clean and reliable.

Finally, I reviewed and adjusted the data types for each field. This included confirming that dates, numbers, and text columns were correctly recognized by Tableau to support accurate filtering, grouping, and visualization.
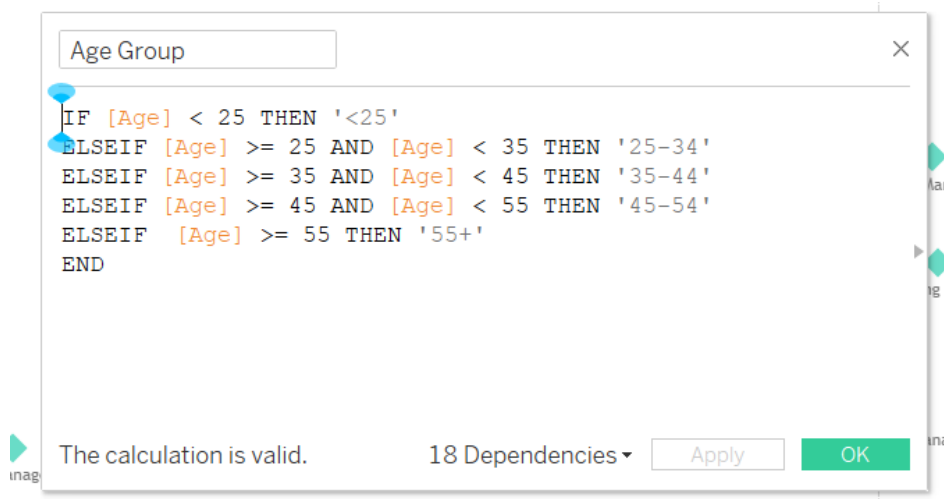
Step 4: Creating calculated measures

Some of the calculated measures I created include;

- Total hired for all the employees.
  Formula used: COUNT([Employee ID])
- Total terminated.
  Formula used: COUNT(IF NOT ISNULL([Terminated]) THEN [Employee ID] END)
- Total active.
  Formula used: COUNT(IF ISNULL([Terminated]) THEN [Employee ID] END)
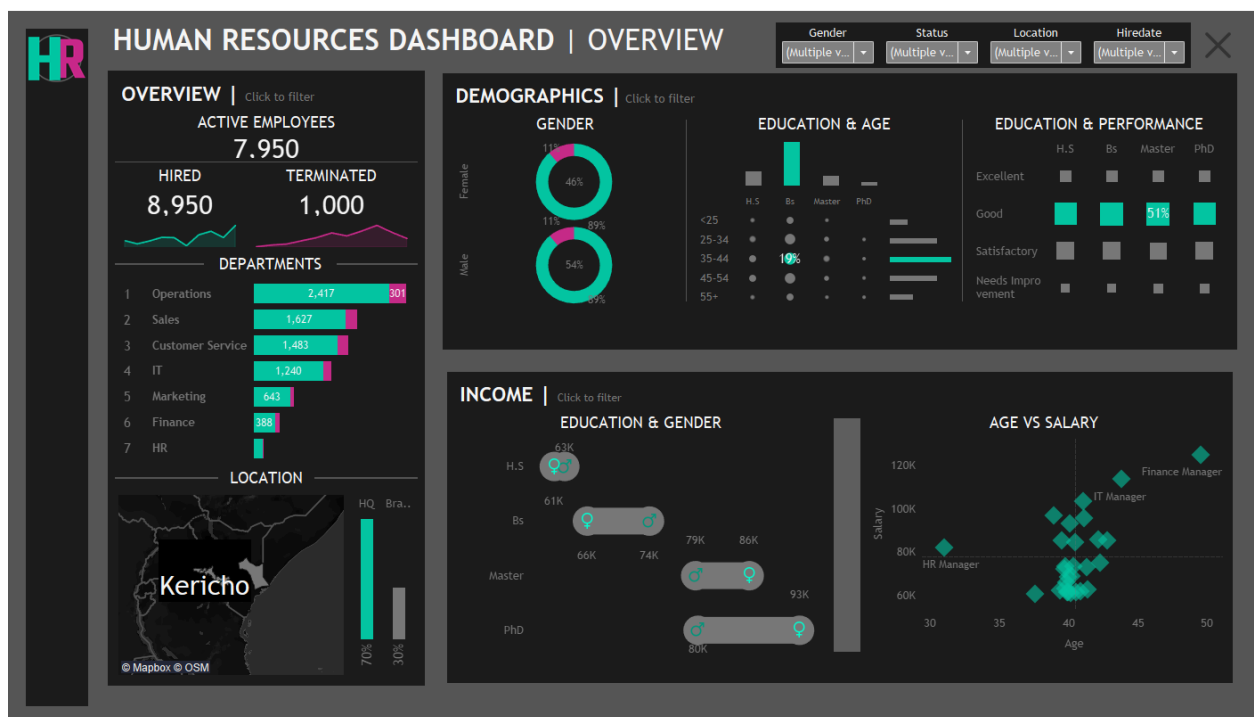- Location.

Location   ✕

CASE [State]
    WHEN 'Nairobi' THEN 'HQ'
    ELSE 'Branch'
END

The calculation is valid.   19 Dependencies ▾   Apply   OK

Formula used:
- Age:
  Formula used: DATEDIFF('year', [Birthdate], TODAY())
- Age Group.
  Formula used:

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

The calculation is valid.   18 Dependencies ▾   Apply   OK

Step 5: Creating a Visualization Dashboard

In this final step, I created an interactive and visually organized dashboard to present key insights clearly and support data-driven decision making. The dashboard was divided into three core sections; **Overview**, **Demographics**, and **Income Analysis**, each designed with specific charts and visuals that best communicate the patterns, trends, and relationships uncovered during analysis.

Some of the chart featured in each of the three sections include:

The Overview section features:

- line charts to show the trend of hires and terminations over time, allowing quick tracking of workforce changes.
- A horizontal bar chart presents the number of employees and terminations by department, making it easy to compare departmental sizes and turnover.
- A map visual highlighting the geographic distribution of employees.
- A vertical bar chart to show the workforce between headquarters and branches.

In the Demographics section,

- Pie charts displayed gender distribution, offering a clear side-by-side view of male and female representation.
- A heatmap to show education levels with age groups, showing how qualifications vary across different age brackets.
- Bar charts.
- A heatmap that connects education levels with performance ratings, helping to identify which groups tend to perform better.

The Income Analysis section,

- A barbell chart to compare average salaries across education levels for both genders, making disparities easy to spot through aligned visuals and values.
- A scatter plot to map age against salary by department for each employee, helping to uncover compensation trends and outliers across roles and age groups.

Link to Dashboard.

I published the dashboard to Tableau Public.

Link to the dashboard.

Publishing the project on my portfolio website.

I have published this dashboard on my portfolio website.

Conclusion

Through this hands-on experience with Tableau, I have gained a deeper understanding of how data analysis can drive informed decision-making in real world applications. From transforming the dataset to building calculated measures and crafting insightful visualizations, each step has reinforced the importance visualizations in analysis. The final dashboard not only showcases key performance indicators but also serves as a powerful tool for optimizing operations. This assignment has strengthened my analytical skills which I also believe that it has prepared me for more advanced applications in the future.