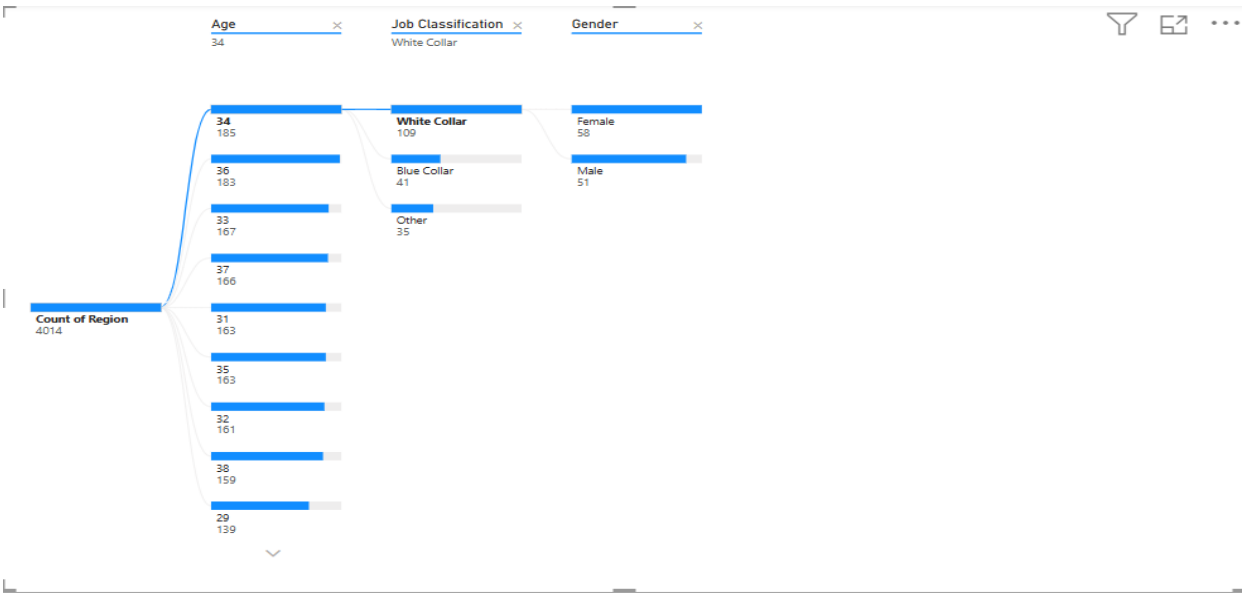
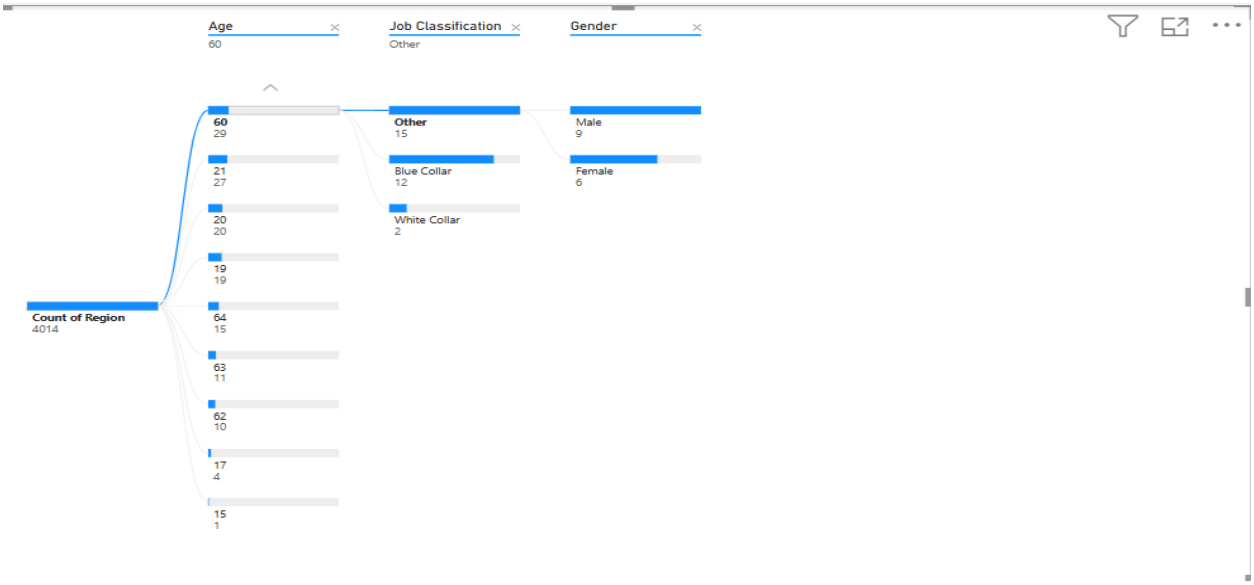
SECTION ONE

Milestone 1 – Data Visualization Techniques in Power BI - Decomposition Tree

Step 1.





1. **In the first view with the first variable, provide 1 insight that can be derived from the visualization.**

From the visuals above, we can see the UK bank has about 4014 customers, with the most active customers aged between 28 and 42 making up more than 50% of the whole population.

Customers in the age of 34 and 36 have the highest demographics, this signifies that UK bank most active customers are youths.

2. **In the second view with the second variable, provide 1 insight that can be derived from the visualization**

Analyzing the job classification variable in proportion to age, this shows that the majority of UK bank customers are doing a white-collar job.

Most young adult and senior adult customers aged 22 to 45, are majorly in a white-collar job. With a few of them doing a blue-collar job.

Most adults aged 45 and above are mostly doing blue-collar jobs or other jobs.

Customers doing other jobs make up the least customer group by age. This shows that UK Bank customers are mostly doing a white-collar job or a blue-collar job. With a few of the customers doing other jobs.

3. **In the third view with the third variable, provide 1 insight that can be derived from that visualization.**

I observed that UK Bank customers in white collar jobs are mostly female, there are lots of males, but the female makes up the majority.

Customers in a blue-collar job are dominated by the male counterpart, probably because it has to do with physical strength or skill.

The bank has a good number of customers doing other jobs, gender wise, they are mostly female.

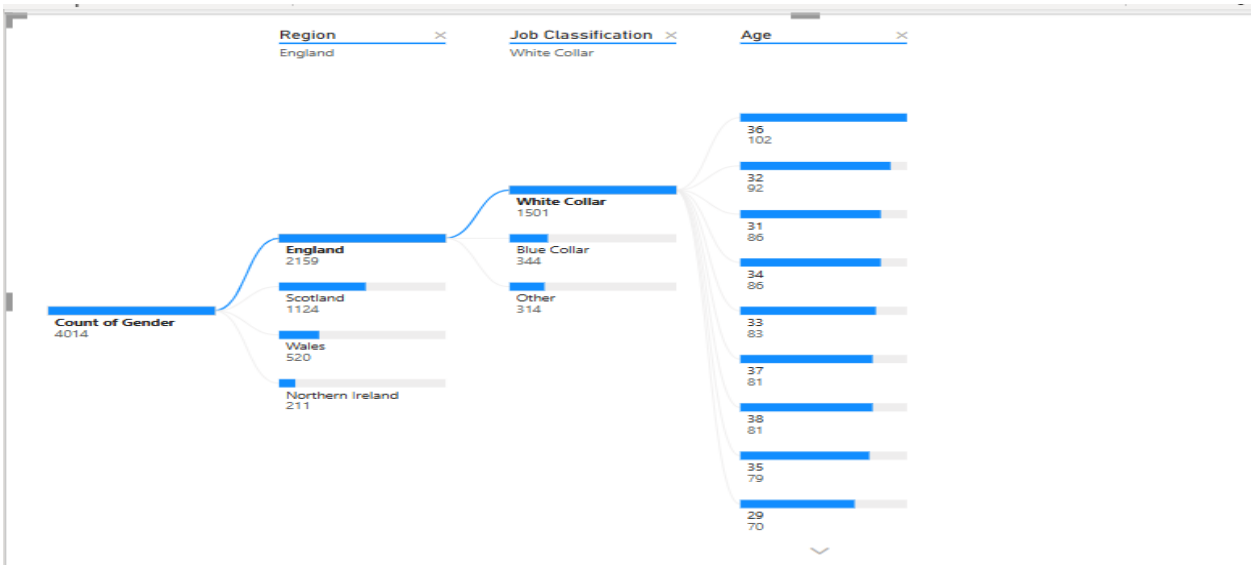
4. **Lastly, provide 3 comparison insights on the key differences seen between each view.**

UK Bank's most target audience are the age of 34 and 36, with both having the highest variable by region. They are mostly females and have a white-collar job.

Most bank customers aged 45 and above are either doing a blue-collar job or other types of job, and the male counterpart mostly dominates them.

UK Bank has fewer customers between the ages of 22 and below, and 50 and above. These customers make up about 5% of the total bank customers, most do other jobs or are artisans, and their gender is randomly distributed.

Ilustration2



1. **In the first view with the first variable, provide 1 insight that can be derived from the visualization**

Uk Bank has a total of 4014 customers, and they are all from four regions, with most of the customers hailing from England, followed by Scotland.

Northern Ireland region holds the least, as customers from this region represent just 5.2% of the target variables.

2. In the second view with the second variable, provide 1 insight that can be derived from the visualization.

Out of the 2159 customers from England, 1501 customers have a white collar job.

Customers from Scotland do more blue-collar jobs

50% of customers from Northern Ireland do other jobs.

3. **In the third view with the third variable, provide 1 insight that can be derived from that visualization**

Most customers doing a white-collar job in England are in their thirties. UK Bank has more customers aged 36 in England doing a white-collar job.

UK Bank has fewer customers between the ages of 52 and 61.

4. Lastly, provide 3 comparison insights into the key differences seen between each view.

Customers from Northern Ireland are mainly youths and young adults, with only a few senior adults.

Most of the bank customers are doing a white-collar job, with majority hailing from England and Wales

Scotland has over 1000 customers but only 84 customers are in a white-collar job. This is the lowest % distribution when compared to other regions. This means that most customers from Scotland are not doing a professional job.

Across all regions, the majority of customers are below 40 years, this means that UK bank customers are more of youths who are actively engaged in employment.

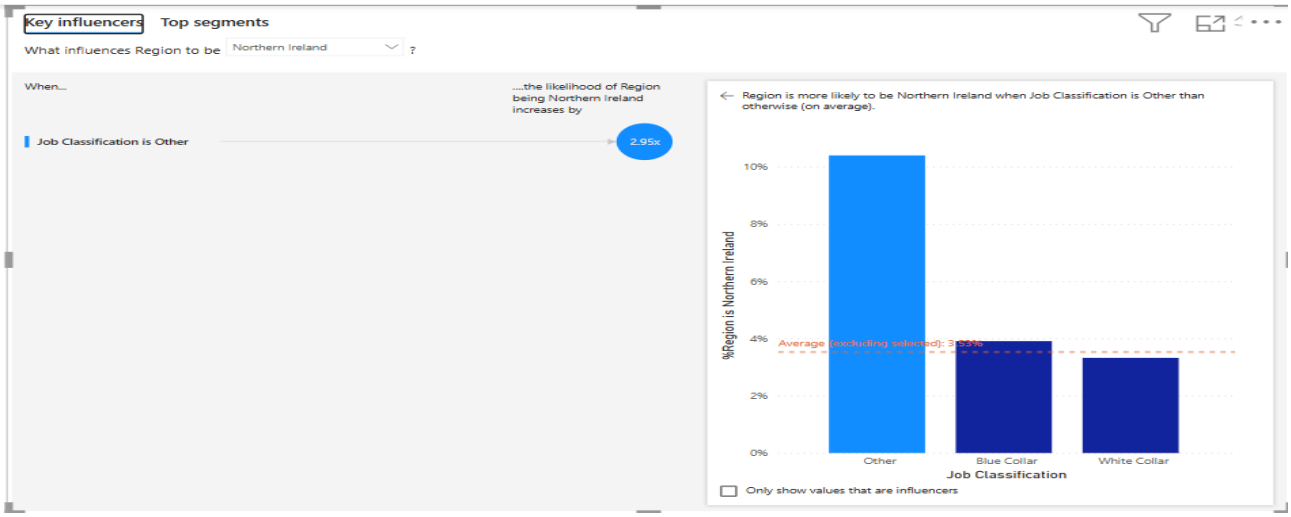
Conclusion

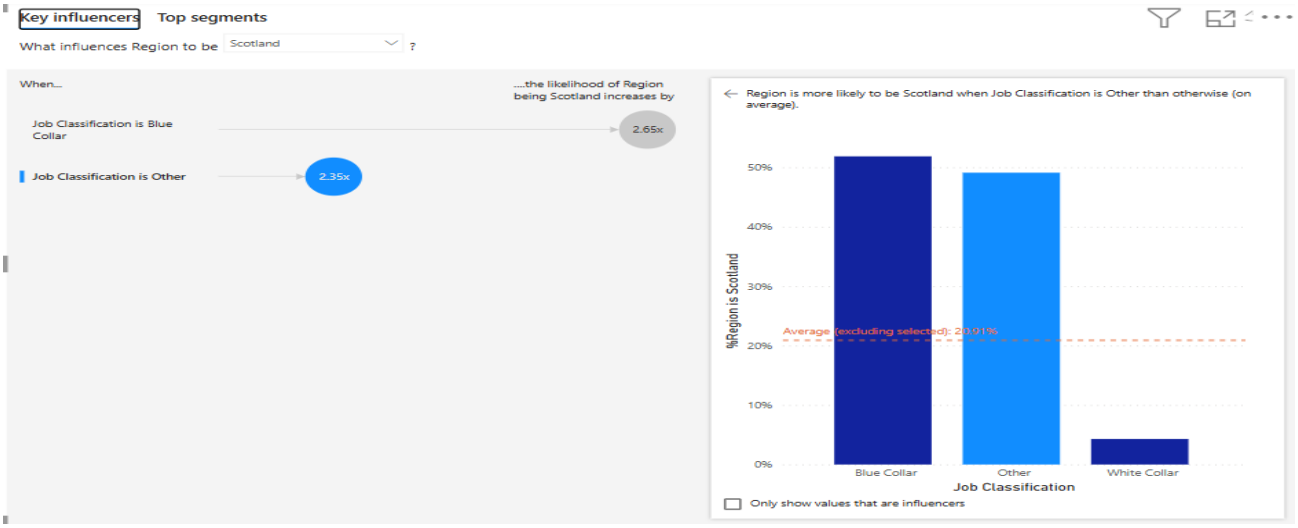
UK bank should focus on how to increase customer satisfaction and build more customer retention programs in Northern Ireland. Since majority of their customers are below the age of 40 and from England, the bank should engage customers with exciting promos, this will drive in more revenue, increase customer satisfaction, and troop in new customers.

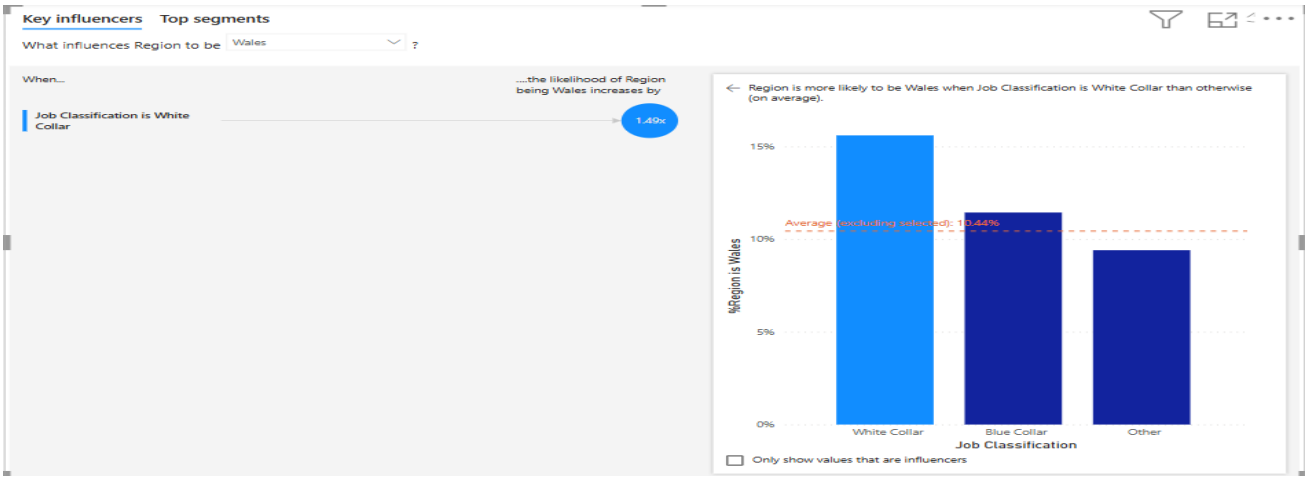
SECTION TWO

Milestone 2 Assignment: Data Visualization Techniques in Power BI- Key Influencers

Step 1: Pick 2 variables and provide visualization screenshot.







2. Comparing Variables & Findings

These Power BI key influencer visuals are comparing how Job Classification influences the likelihood of the person being from a specific UK region. The job classifications being compared are White Collar, Blue Collar, and Other, and the regions being compared are England, Northern Ireland, Scotland, and Wales.

Findings:

England:

- White Collar jobs significantly increase the likelihood of the person being from England, by 2.40x.
- 75%+ of White-Collar workers are English, much more than the average of 31.96%.
- Blue Collar and Other job categories have much lower percentages in England.

Northern Ireland:

- Customers doing other job types are 2.95 times more likely to hail from Northern Ireland.
- Over 10% of people who fall under "Other" jobs are from Northern Ireland, more than the average 3.55%.

Scotland:

- Customers doing a blue-collar job and other jobs are more likely to come from Scotland by 2.65x and 2.35x respectively.
- Over 50% of blue-collar workers and those in "other job" categories are from Scotland, compared to a lower overall average of 20.01%.

Wales:

- Region is more likely to be Wales when the job classification is white-collar jobs.
- 16%+ of white-collar workers are from Wales, higher than the average 10.44%.
- Blue collar and Other jobs are subpar.

Two Unique Insights/Recommendations:

A. Job Classification-Based Financial Products:

For England and Wales, market premium bank products such as investment portfolios, mortgage loans, or credit cards with better limits and rewards should be tailored to White Collar professionals (since they are more likely to have stable, higher incomes).

For Scotland and Northern Ireland, focus on blue-collar and “other” occupational segments. The bank could develop financial products like flexible savings accounts, lower-interest personal loans, or credit repair services that cater to individuals in skilled trade or non-traditional occupation categories.

B. Localized Marketing Campaigns:

England/Wales: Run LinkedIn or professional network-based campaigns for white-collar professionals, highlighting financial planning and career development-oriented services.

Scotland/Northern Ireland: Execute community-based campaigns, possibly through local events, radio, or regional sponsorships, promoting functional bank services, low-fee checking accounts, or services for small businesses.

3. What is Interesting About This Visualization Technique

I found the Key Influencers Visualization technique in Power BI very interesting because:

- Simplicity & Clarity: It distills complex relationships into straightforward, easy-to-digest metrics (e.g., "Likelihood increases by 2.4x"), comprehensible even to non-technical stakeholders.
- Actionable Insights: Rather than simply presenting correlations, it specifies certain variables influencing outcomes that can directly inform decision-making.
- Visual Comparison: Bar charts allow for immediate visual comparison of job categories with regional averages, this makes trends and deviations more evident.
- Interpretability: Having the capability to toggle among different target variables (regions) provides flexibility for exploring a variety of business questions.

Using this technique bridges the gap between data analysis and actionable business strategy, and therefore, it is an excellent aid to strategic planning and marketing.

SECTION 3

Comparison Between Decomposition Tree and Key Influencers Data Visualization Techniques

1. Advantages and Disadvantages of Using Either of the Two Techniques

Decomposition Tree

Advantages of using the decomposition tree:

- Drill-down capability: It allows for step-by-step exploration of the data, making it easier for users to understand hierarchical relationships.
- Granular insights: Users are able to analyze data layer by layer, which helps in identifying key contributors to specific metrics.
- Customizable Exploration: Users can dynamically choose which variables to drill into, enabling flexibility in finding insights.
- Efficient for Large Datasets: The hierarchical decomposition helps in analyzing large and complex datasets without overloading the user.

Disadvantages of using the decomposition tree:

- Difficulty in interpretation: Requires a good understanding of hierarchical data structures, which can be challenging for non-technical individuals.

- No direct causation analysis: Although it detects patterns and influencers, it does not provide a direct measurement of influence like key influencers.
- Requires Prior Knowledge: The users must possess a good understanding of the dataset so that they can decide which drill-down paths will yield the most useful insights.
- Limited Direct Comparisons: It is not similar to other approaches because it is interested in breaking down one measure rather than comparing different variables side by side.

Key Influencers

Advantages of using key influencer data visualization:

- Actionable cause-and-effect relationships: The model quantifies the extent to which each factor contributes to the outcome, so findings are more actionable.
- Easy to interpret: Key drivers are easily communicated to non-technical stakeholders through percentage increases and likelihood ratios.
- Great for Business Decision-Making: Because it brings about immediate relationships, it is great at identifying actionable business insights.

Disadvantages of using key influencer data visualization

- Less drill-down flexibility: Key influencers prioritize predefined relationships over user-directed exploration, as opposed to decomposition trees.
- Potential oversimplification: Some complex interactions between variables may not be communicated to their full extent in a single visualization.

- Limited to Detected Relations: Compared to decomposition trees, users won't be able to see beyond detected key influencers except if they redesign the dataset or visualization.

2. **Which Method Was More Intuitive to Use?**

The “Key Influencers” method was likely more intuitive because:

It provides exact numeric influence (e.g., "White Collar jobs multiply the chance by 2.40x"), which is easier to understand. There is less manual exploration in comparison to the decomposition tree, in which the users have to decide which paths to drill down into.

On the other hand, the “Decomposition Tree” requires more manual probing and understanding of hierarchical relationships and hence is slightly more complex to use.

3. **Which Technique Provided the Best Clarity for Insights?**

For the bank dataset, “Key Influencers” provided more clarity because:

- It explicitly measured the relationship between job category and customer distribution across regions.
- It yielded actionable insights (e.g., customers in specific job categories are more likely to come from specific regions).
- The visualization summarized complex relationships into digestible metrics.

While the “Decomposition Tree” facilitated the breakdown of UK bank customers demographic and job figures, it was less easy to draw conclusions from than the Key Influencers' direct influence measures.

4. Challenges in Understanding the More Difficult Method

The Decomposition Tree was more challenging because:

- It was a matter of choosing the right path for drill-down analysis, which had the potential to miss significant insights should a wrong path be chosen.
- Interpreting the role played by different variables in customer segmentation needed more interpretation compared to the Key Influencers' simple numerical outputs.

5. Additional Insights About Bank Customers

Two additional insights of interest from the Key Influencers technique:

- Employment Type and Region Determine Banking Needs: Since England and Wales are full of white-collar workers, UK Bank can create upscale financial products for them, while Scotland and Northern Ireland might need more lenient bank services.
- Geographic Job Discrepancies Affect Banking Requirements: The likelihood ratios indicate that different regions have distinct job distributions. With this, UK Bank should develop a robust localized banking services based on the requirements of blue-collar and "other job" customers in selected regions.

Reference

P6 UK Bank Customer Profile Dataset used was provided in the assignment.

Power BI was used for data visualization.

Vincent, C. (2025). *Milestone 1 Assignment: Data Visualization Technique in Power BI-Decomposition Tree* (pp. 1–7).