

In November 2022, I attended the Data Science and Engineering conference organised by NatWest Group in Edinburgh. As part of the conference, I took part in a hackathon. The challenge was to create a personalised solution for NatWest's business customers using fictitious retail customer data.

My team and I came up with a **personalised dashboard** to provide small businesses with insights on customer spending patterns. To do so, we built an **unsupervised classification model** based on customers' personal characteristics such as age and gender, segmenting customers into personas. Businesses base their marketing decisions on each persona's spending habits to increase revenue. The solution was positively judged by NatWest senior leaders in Data & Analytics and was **awarded first place**.



# **DSEC HACKATHON**

# **PROPOSAL**

TEAM CLOUD 9



# OUR PROPOSAL



**M**ARKETING

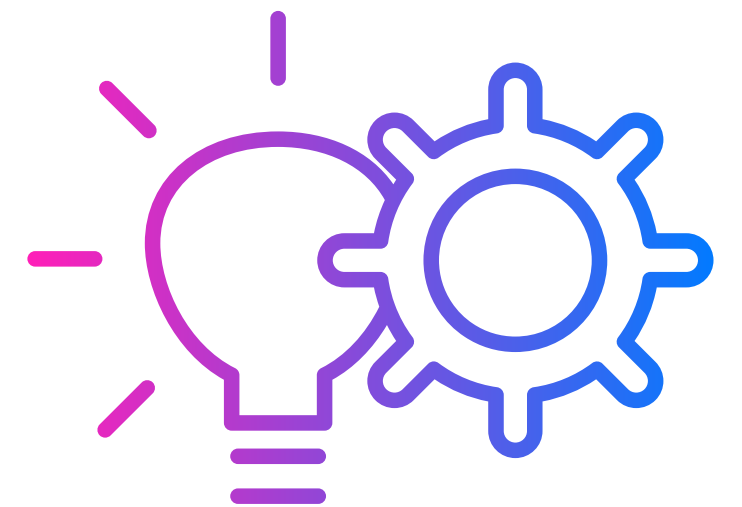
**I**NSIGHTS

**K**EY

**E**NGAGEMENT

# CUSTOMER PROBLEM

- Small Businesses account for 99.5% of the business in UK (FSB, 2022), which equates to **£2.3 trillion** in revenue.
- They drive local economy but a lack of resources limit their potential for growth. This is further impacted by the **cost of living** crisis.
- **Marketing** tends to be one of the first avenues to reduce expense, if they are even spending on it in the first place.



# HOW WE CAN HELP

Leveraging Natwest group customer and transactional data to provide a **personalised dashboard** with insights on:

- Customer behaviour within their industry
- What the different personas are spending in that specific industry
- What their journeys on the market are

This will allow them to make informed decisions to drive their marketing strategy



# HOW WE ACHIEVED THIS

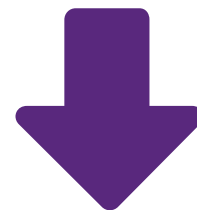
Customer Transactional Data



Filter by location



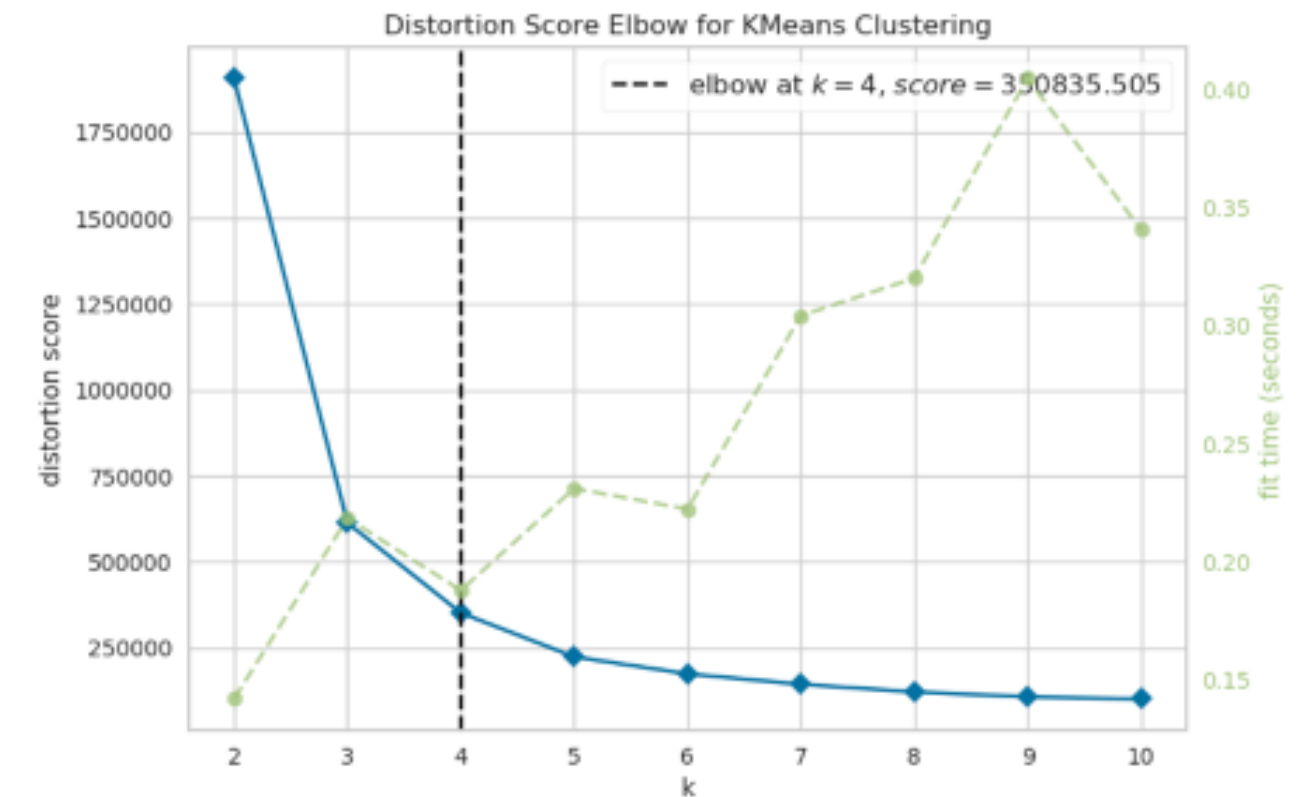
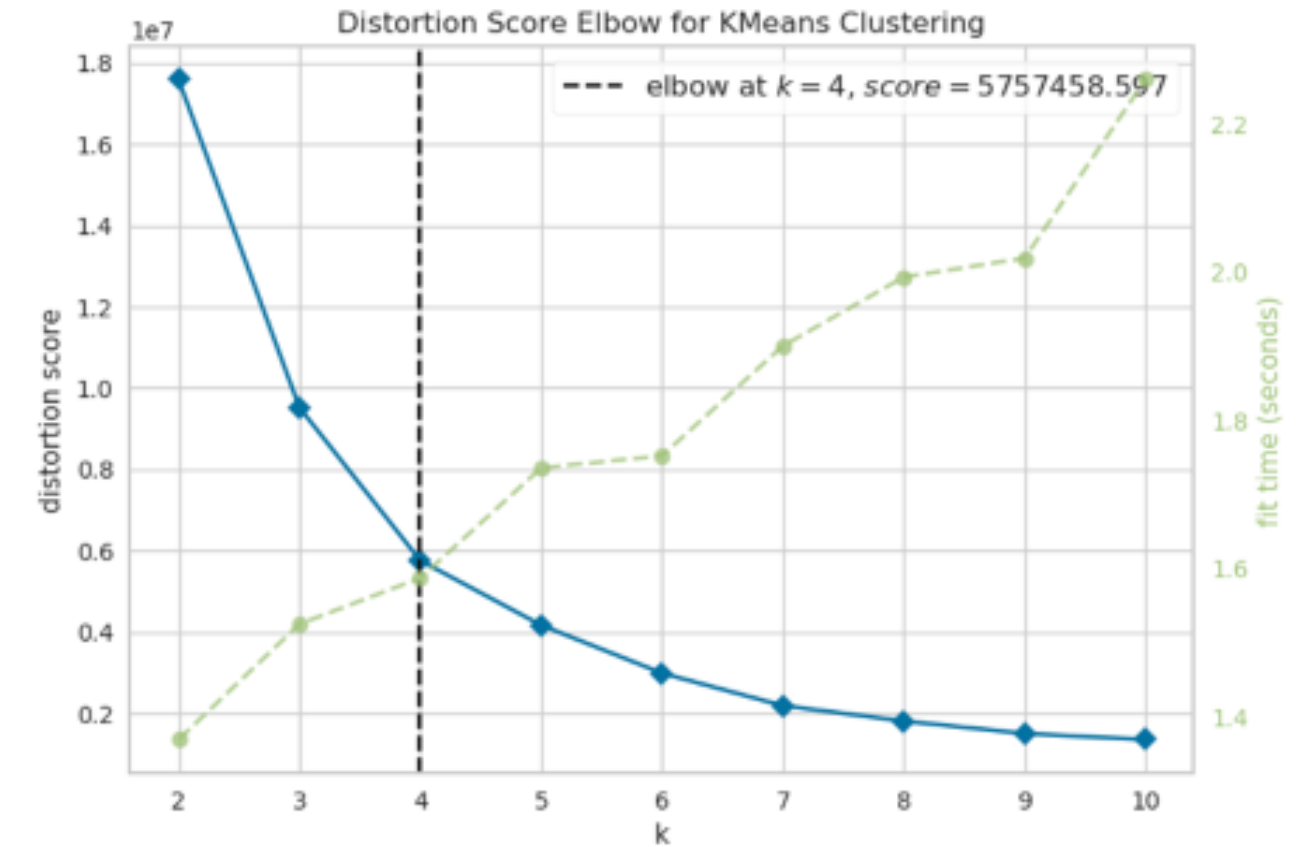
Segmentation applied to each industry category



Customer Groups identified for each segment

# MODEL

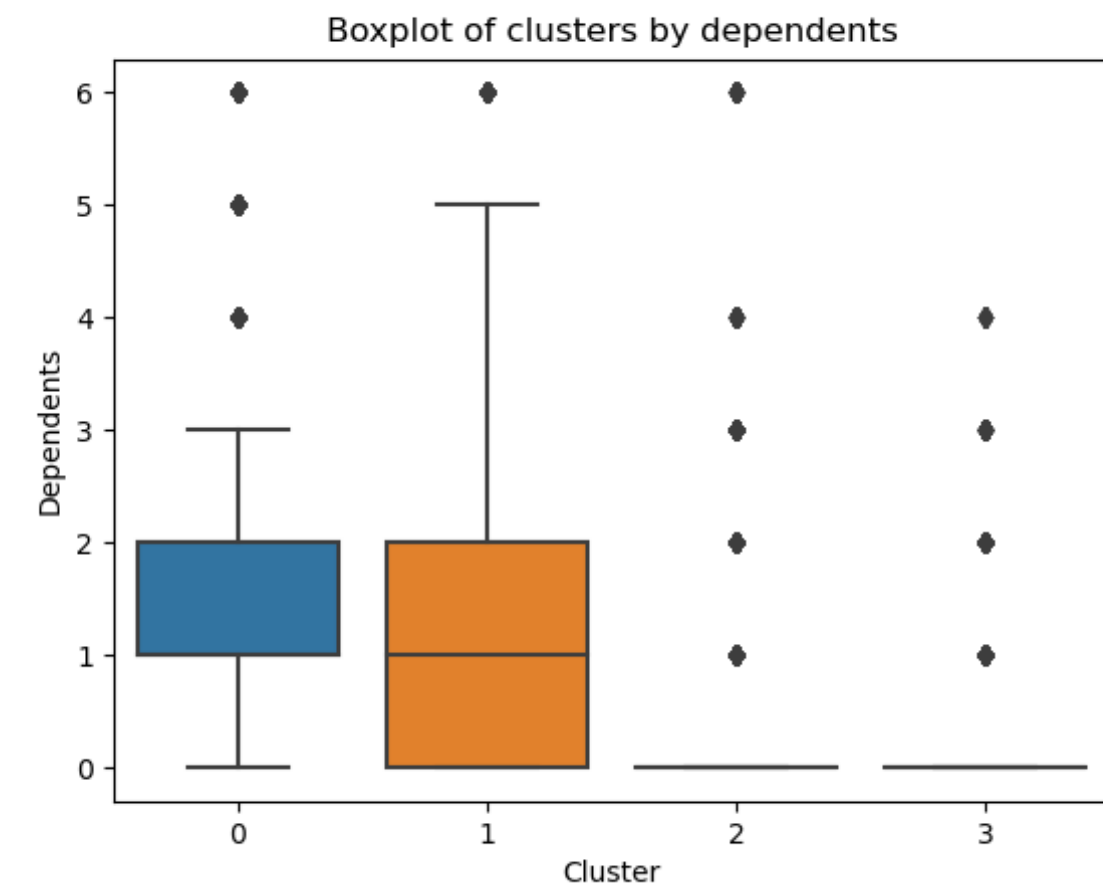
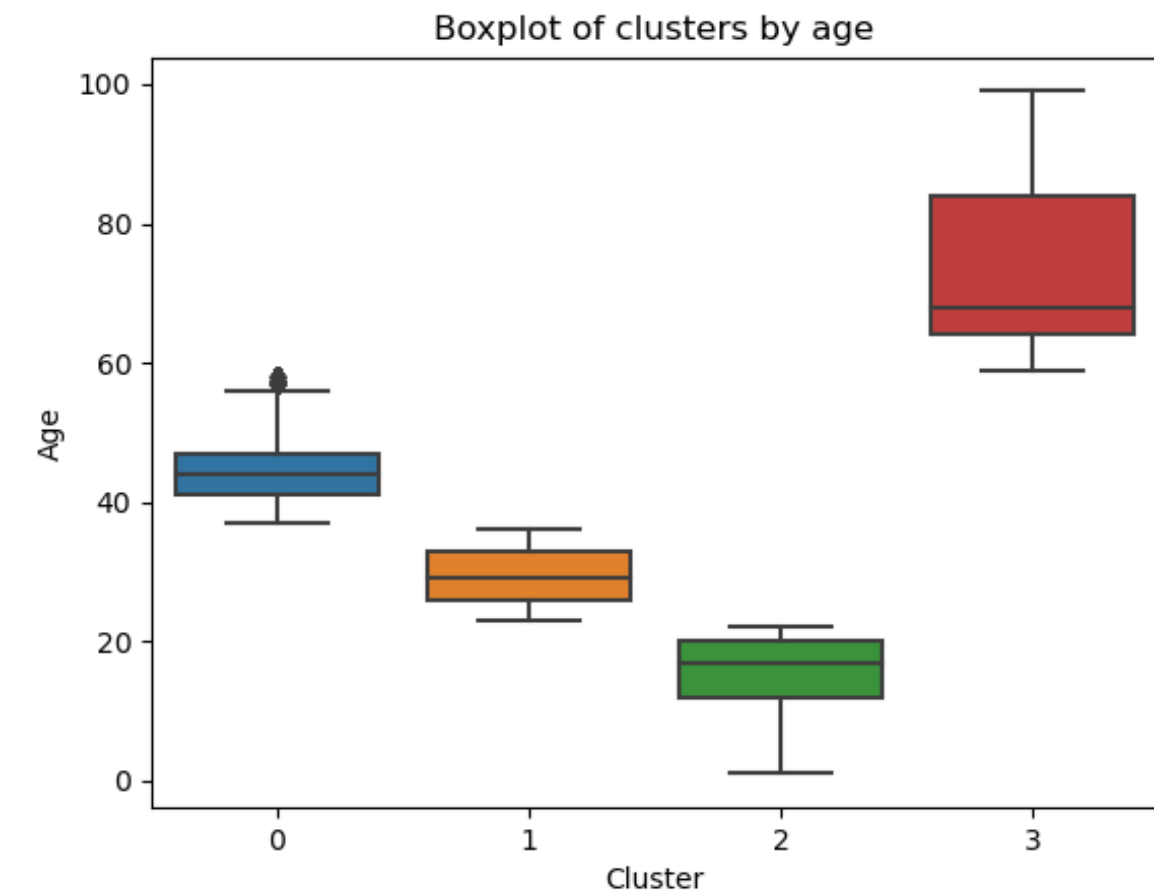
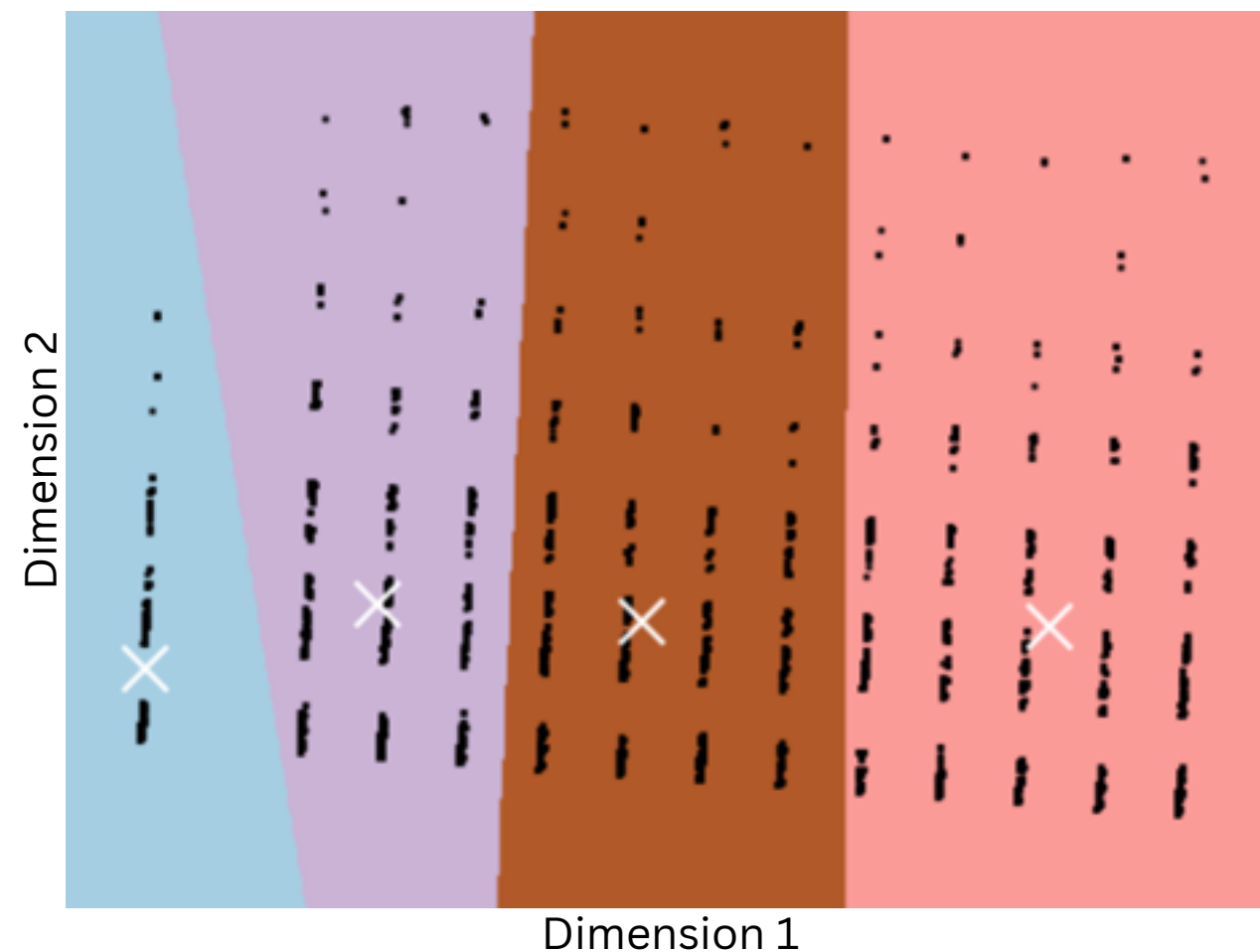
- Unsupervised clustering used to partition transaction data into K clusters, for each sector
- K means algorithm chosen for fast processing time and ease of application



# RESULTS - CATERING

- Data quality results in separation primarily by age but concept can be further extended

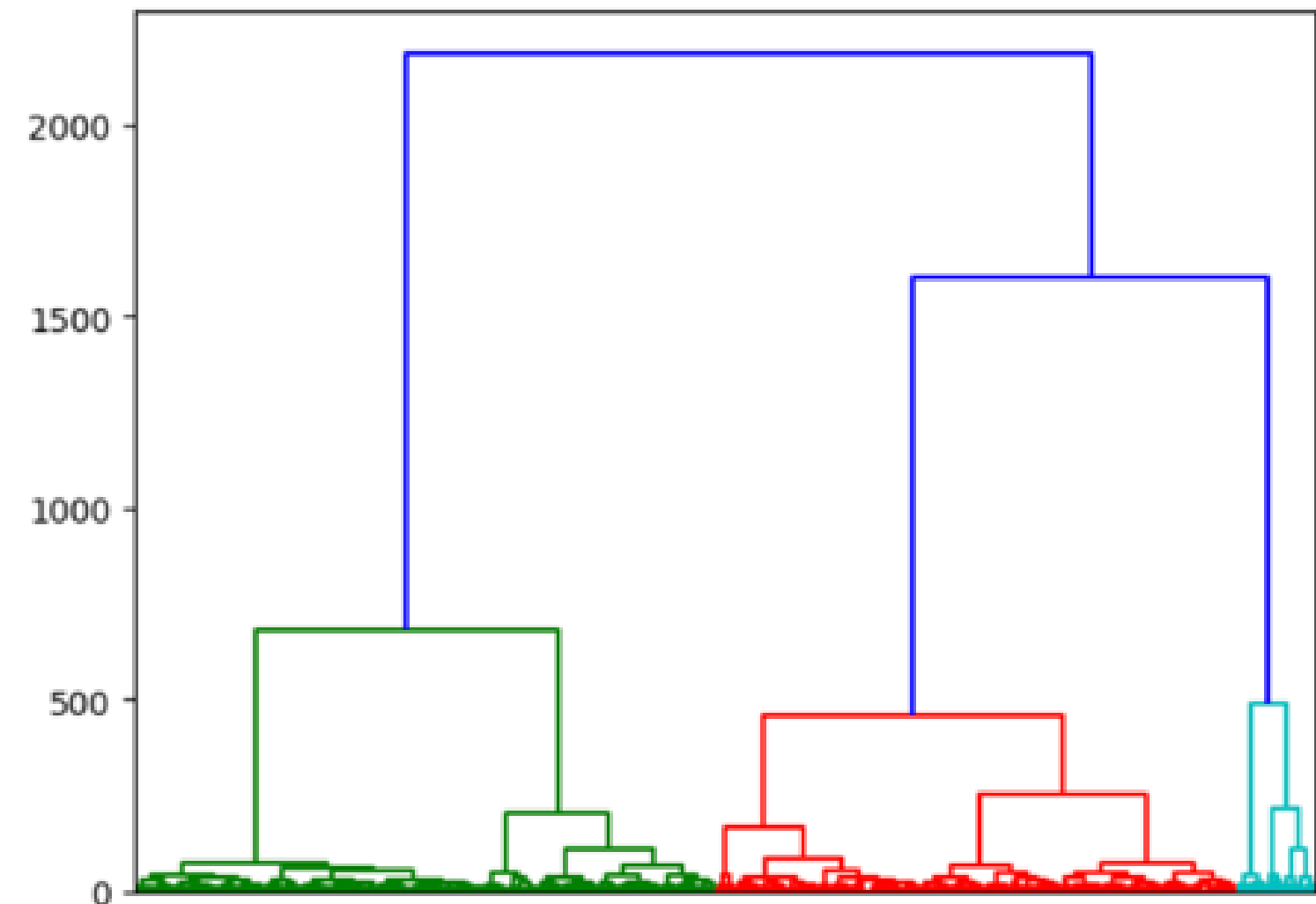
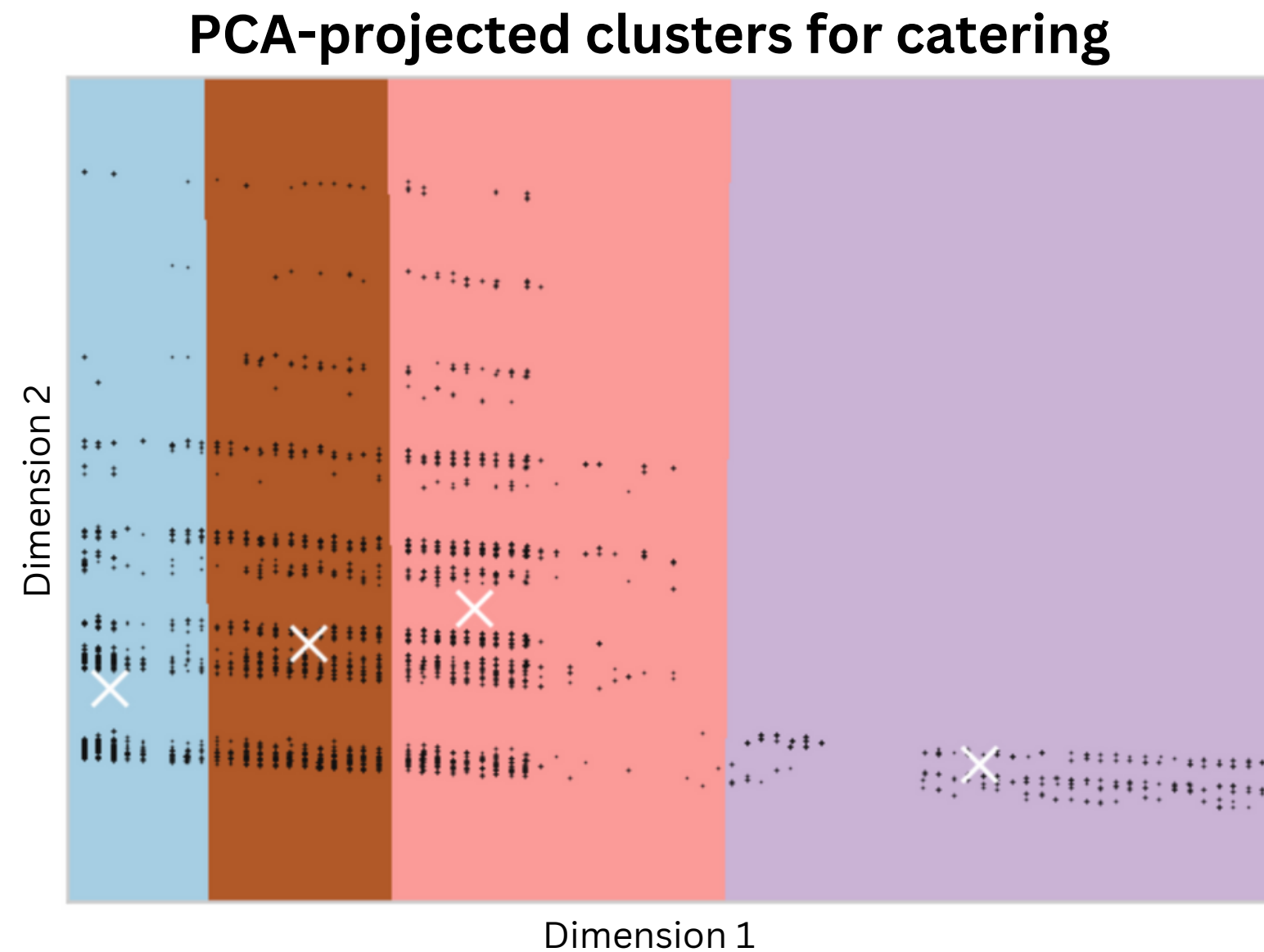
PCA-projected clusters for catering





# RESULTS – ENTERTAINMENT

- Different size industries are similar in cluster shapes



# POSSIBILITIES OF IMPROVEMENT FOR THIS OFFERING



## Clustering by Sector and Location

Initial Model MVP for each sectors per city.  
Adding further locations



## Ability to drill down to specific business

Additional Data will allow to drill down to a specific business.



## Customer Journey Identification

Additional model to understand where the customers are coming from to the business and where they go after.



## Seasonal Analysis

Additional layer to understand variations during different months, seasons.

Key Metrics

624,967

Customers

180,415

Persona 1

153,048

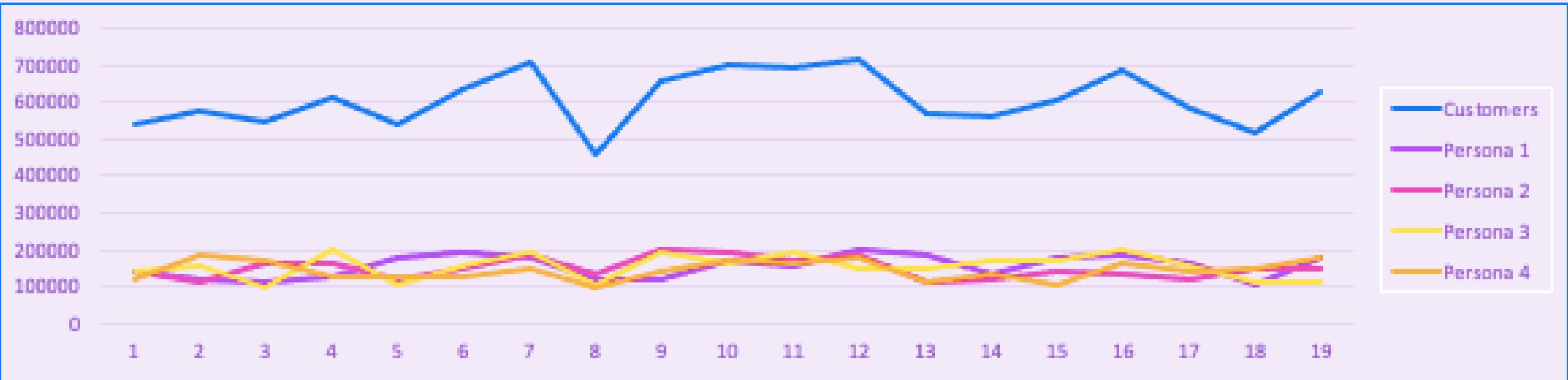
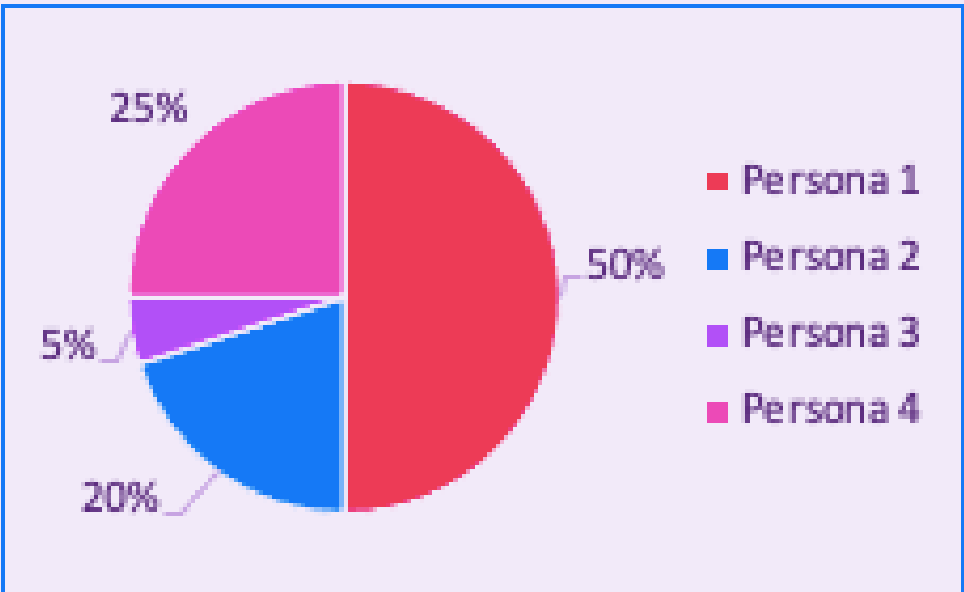
Persona 2

109,248

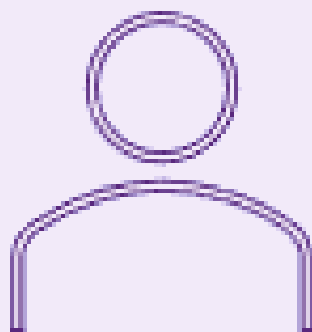
Persona 3

182,256

Persona 4



Persona 1



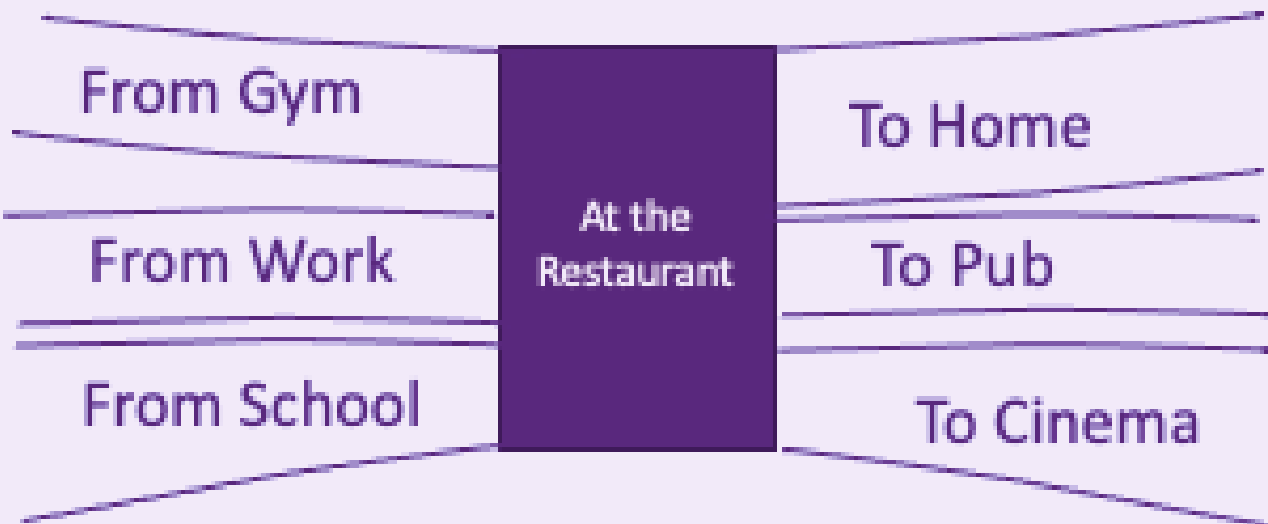
Profile

Age: 18-35

Homeownership: Rent

Relationship Status: Single

Employment Status: Employee



# WHAT'S IN IT FOR NATWEST

1

Follow our purpose of empowering business to thrive

2

Champion potential of our business customers

3

Improve service offering

4

Opportunity to drive value by offering to wider market



**THANK YOU!**  
**QUESTIONS?**

TEAM CLOUD 9



# REFERENCES

NATIONAL FEDERATION OF SELF EMPLOYED & SMALL BUSINESSES LIMITED (2022A) SOARING ENERGY BILLS ARE FUELLING THE COST OF DOING BUSINESS CRISIS. AVAILABLE AT:  
[HTTPS://WWW.FSB.ORG.UK/RESOURCES-PAGE/COST-OF-DOING-BUSINESS-CRISIS.HTML](https://www.fsb.org.uk/resources-page/cost-of-doing-business-crisis.html)

NATIONAL FEDERATION OF SELF EMPLOYED & SMALL BUSINESSES LIMITED (2022B) UK SMALL BUSINESS STATISTICS. AVAILABLE AT: [HTTPS://WWW.FSB.ORG.UK/UK-SMALL-BUSINESS-STATISTICS.HTML](https://www.fsb.org.uk/uk-small-business-statistics.html)