Summary Report

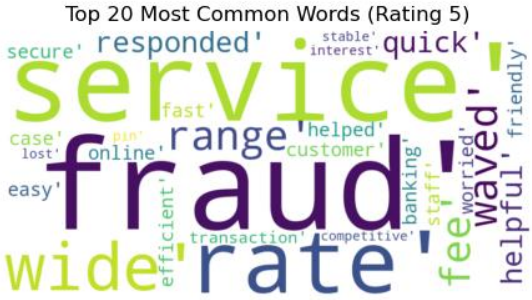
Analytical Insights

Customer Feedback Analysis:

Customers facing online account access issues primarily cited concerns with complexity, service quality, errors, frustrations, and bank. This suggests the main issue is difficulty in using the service and the frustrations behind it.

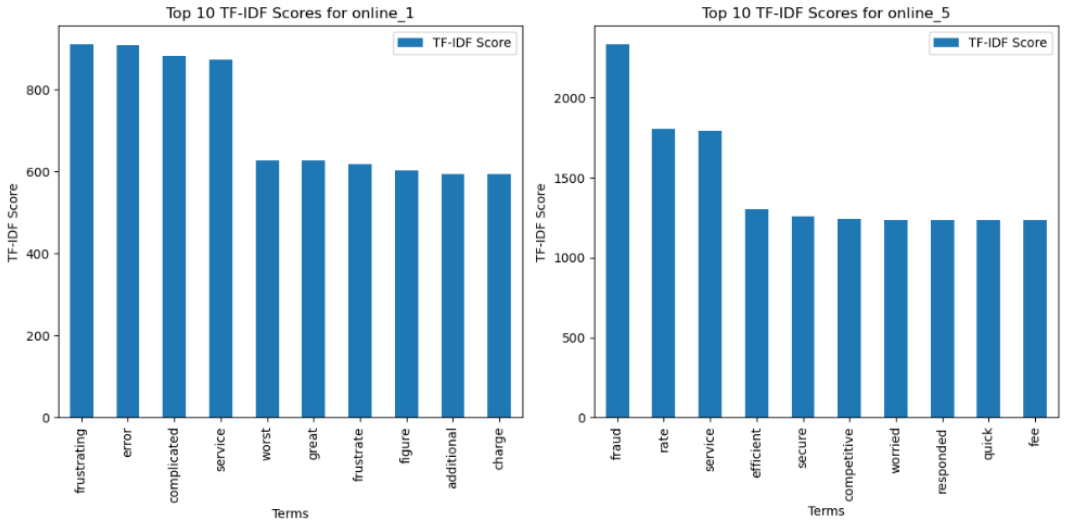
Rating 1 feedback often highlighted problems such as error, complicated, service, frustrating, and additional, indicating dissatisfaction. This reflects the issues in the first point.

Rating 5 feedback frequently mentioned fraud, service, rate, wide, and range. This suggests that customers have had a positive experience when fraud has taken place on their account and customers are happy about the range of services available.



Vectorizer and TFIDF Analysis:

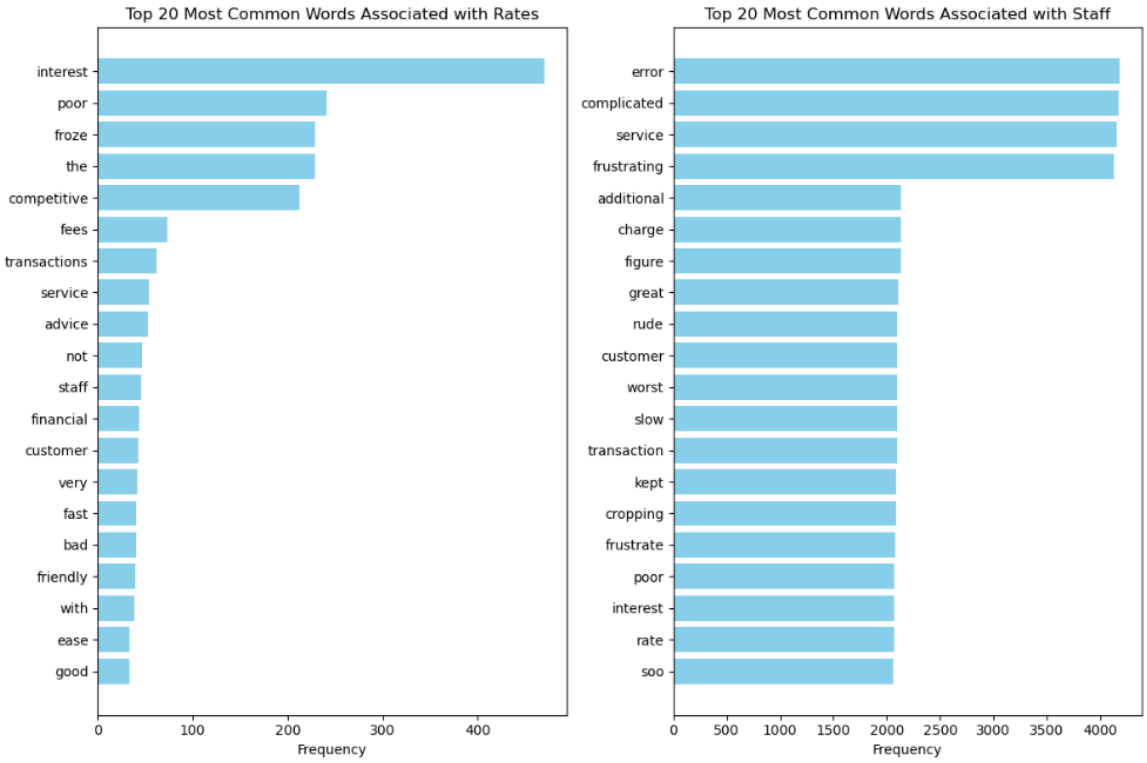
Vectorizer and TFIDF analysis yielded similar results, with frustrating, error, complicated, service, and worst being prominent for Rating 1, and fraud, rate, service, efficient, and secure for Rating 5.



Mortgage Review Analysis:

Neutral words like 'staff' and 'rate/s' were examined, with a positive to negative ratio of approximately 0.87, suggesting a higher prevalence of positive mentions.

Top three words surrounding 'rate/s' were interest, poor, and froze, while those around 'staff' were error, complicated, and service.



District 50 and District 40 were identified as branches with the most positive rating proportionally to negative rating, having only Rating 5 and no Rating 1. Further analysis would need to take place around branch location and city size for a more accurate comparison.

Sentiment Analysis Models:

Vader was utilised to enhance the dataset with negative, neutral, positive, and compound measures. Mistakes in compound sentiment were noted.

	Date	Review	Rating	Product	District	neg	neu	pos	compound
5340	08/11/2016	Secure From Fraud competitive rates where i lo...	5	Online Services	53	0.268	0.324	0.408	0.4939
4878	10/09/2016	Wide Range Of Services waved fees friendly sta...	5	Online Services	22	0.092	0.558	0.351	0.7579
15822	13/08/2017	Competitive Rates worried about fraud but help...	5	Online Services	73	0.342	0.563	0.096	-0.8674
18317	21/10/2016	Efficient easy online banking stable interest ...	5	Online Services	60	0.000	0.452	0.548	0.8720
7501	02/09/2017	Worried About Fraud But easy online banking wh...	5	Online Services	31	0.457	0.333	0.210	-0.7992

NLP models achieved 100% accuracy but faced limitations due to the standardisation process, resulting in a smaller sample size for mortgage ratings (750 responses for both Rating 1 and Rating 5) compared to online responses (6000 responses for each).

The confusion matrices below demonstrate that the models accurately identified all negatives and positives within the test data.

Online Service Model Confusion Matrix

	1	5
1	1527	0
5	0	1473

Mortgage Confusion Matrix

	1	5
1	182	0
5	0	193

While models performed well with similar comments, ambiguity arose with varying comments, resulting in a 50:50 classification in some cases. Efforts to create a comment filter for model processing showed promise but require further refinement.

Future Recommendations

Customer Surveys:

Ensure an equal mix of mortgage and online service reviews for a balanced understanding. Also, strive for an even amount of data for both models to analyse customer feedback fairly across all areas.

Sentiment Analysis Modeling:

Collect a wider sample with more varied selections to train sentiment analysis models, enhancing their ability to handle diverse comments and improve accuracy.

Continuously evaluate and improve sentiment analysis models, incorporating domain-specific features, advanced techniques, and enhancing interpretability to provide actionable insights.

As mentioned above, further refinement required on the comment filter.

Deep learning models could be considered to enhance accuracy of sentiment analysis models.