SENTIMENT ANALYSIS
Comprehensive Report

Generated: 2026-02-18 01:34:22

Dataset: 1,000 records analyzed

Models: ALL

Output Directory: sentiment_results/

Sentiment Analysis Automation — Commercial Edition

Executive Summary

This comprehensive sentiment analysis report presents findings from **1,000 records** processed using state-of-the-art natural language processing models. The analysis reveals a **positive** overall sentiment with **82.9%** of records classified as positive. The net sentiment score stands at **+69.0%**, indicating strong positive sentiment across the dataset.

Sentiment	Count	Percentage
Positive	829	82.9%
Neutral	32	3.2%
Negative	139	13.9%

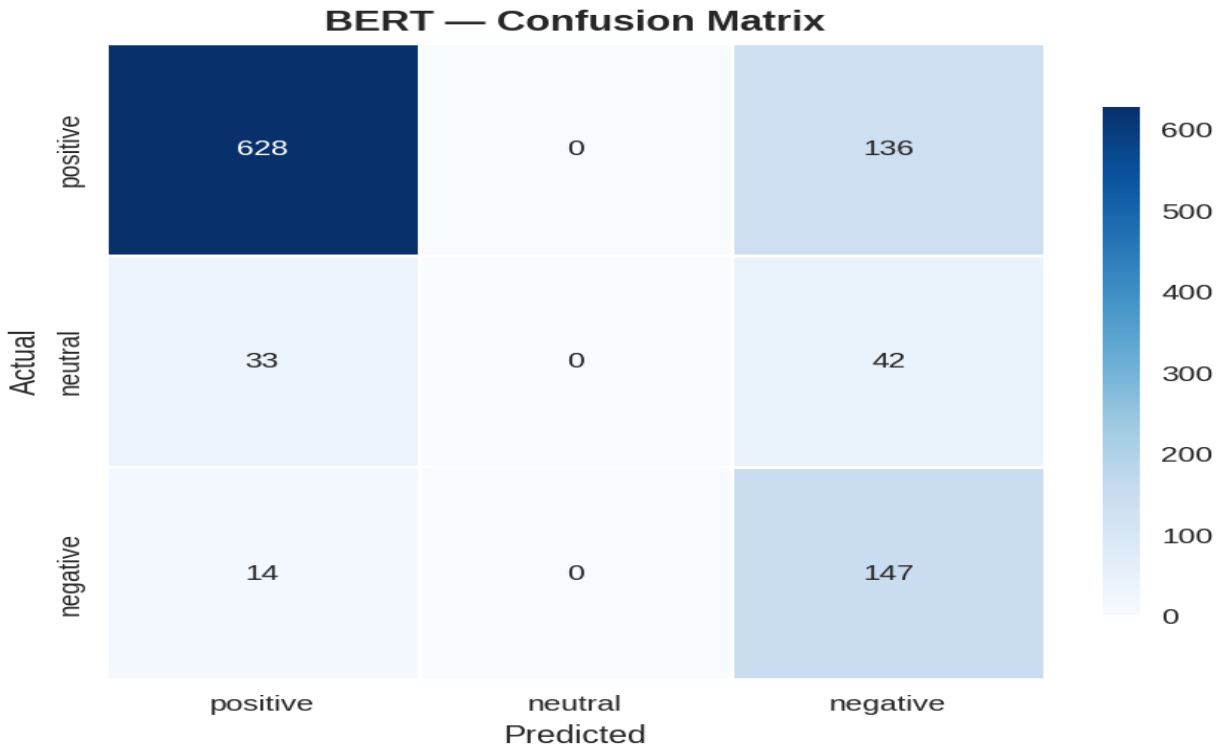
Key Insights

■ **Insight 1:** The dominant sentiment is 'positive' with 82.9% of records.

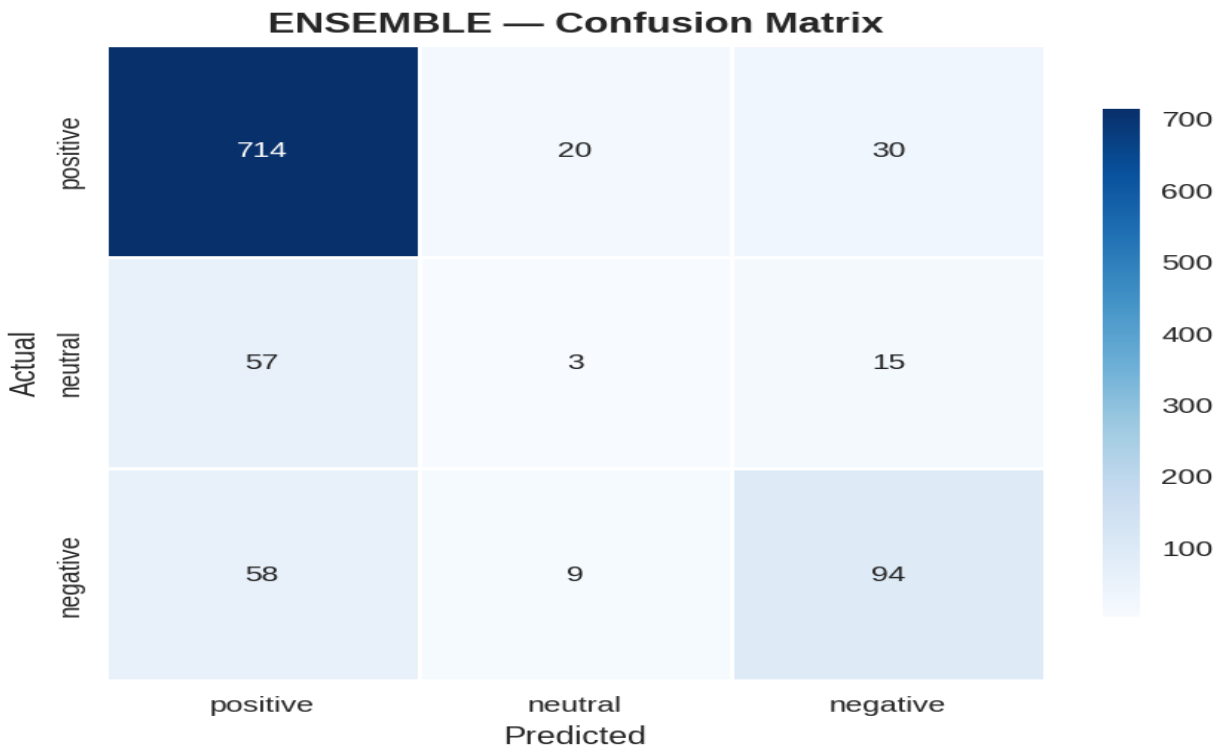
■ **Insight 2:** Strong positive net sentiment (+69.0%). The audience is highly satisfied.

Visualizations

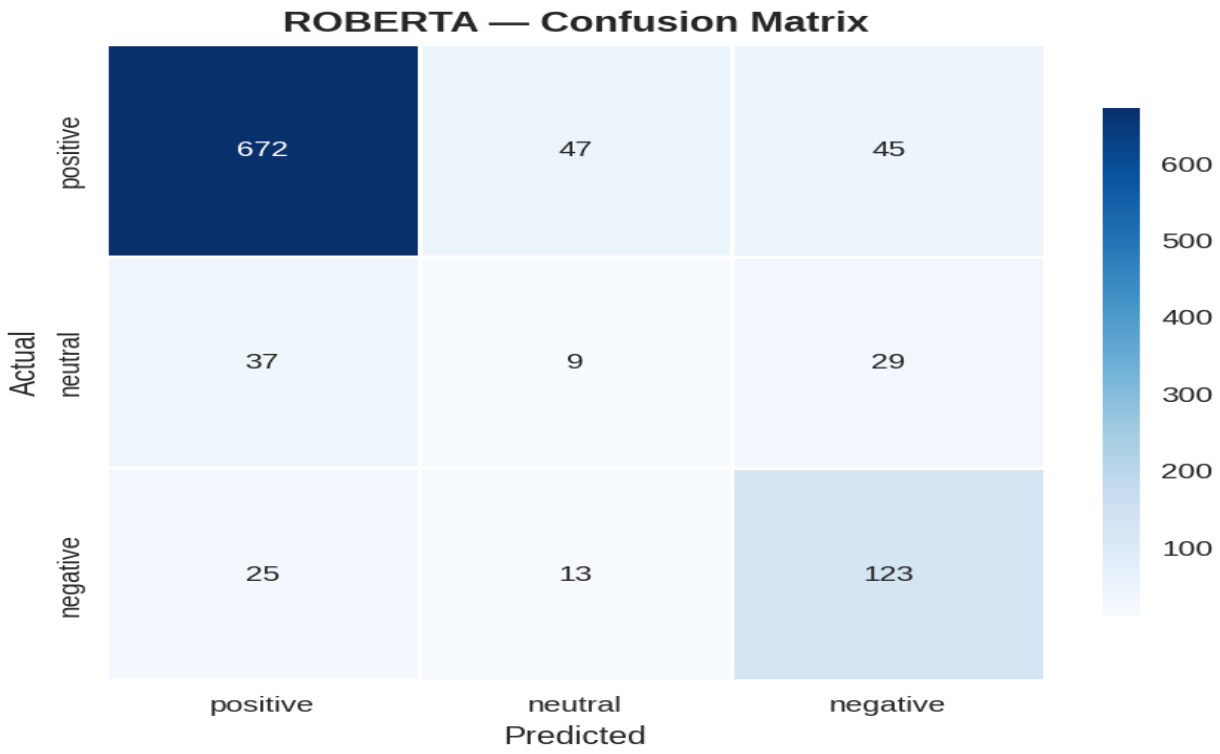
Confusion Matrix Bert



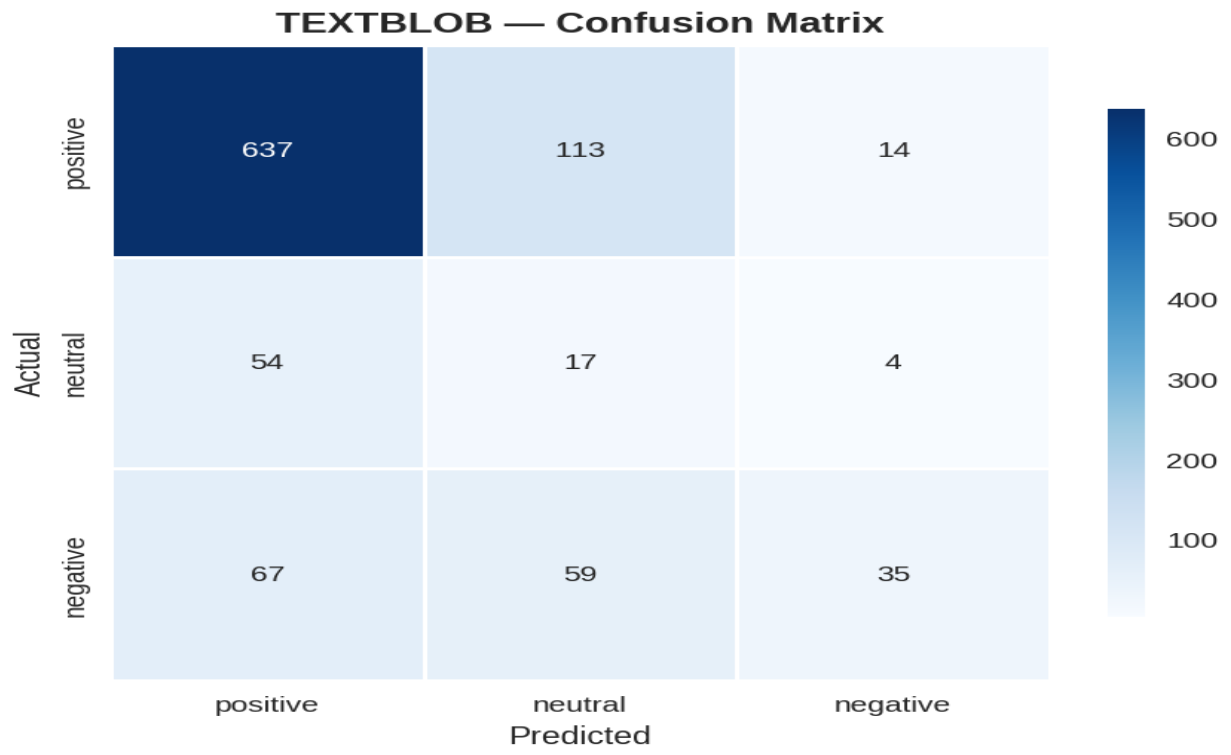
Confusion Matrix Ensemble



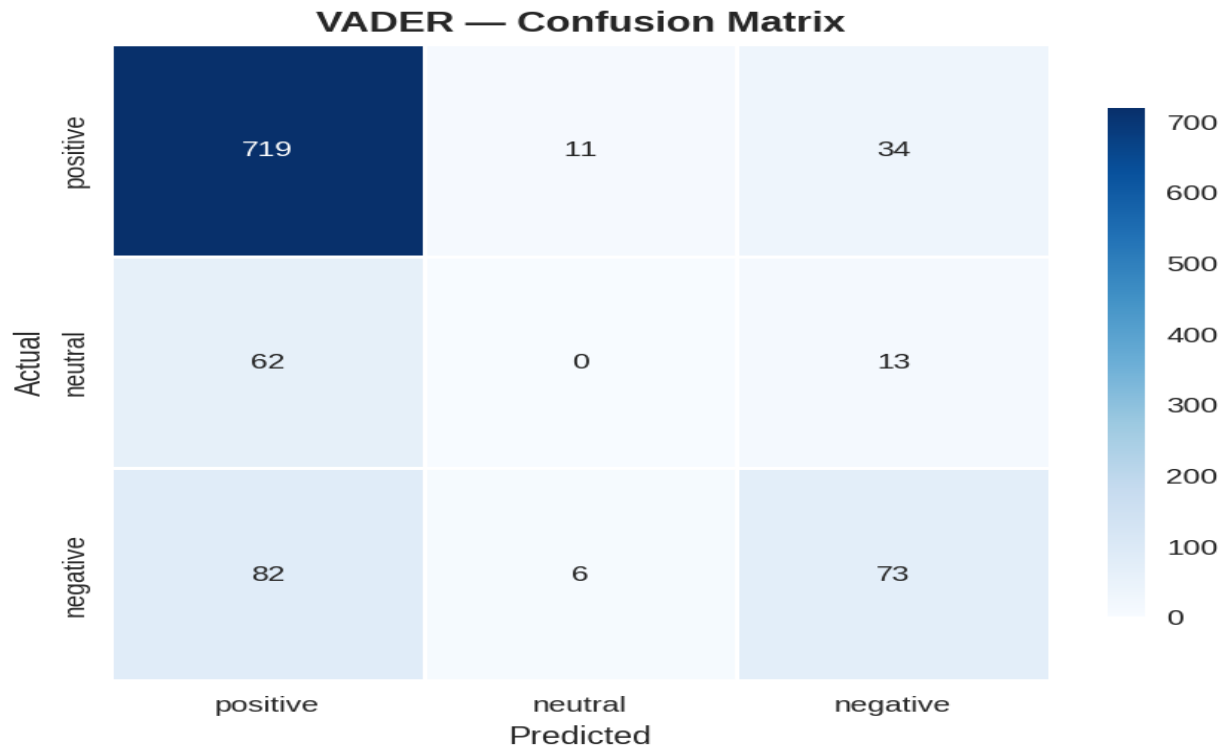
Confusion Matrix Roberta



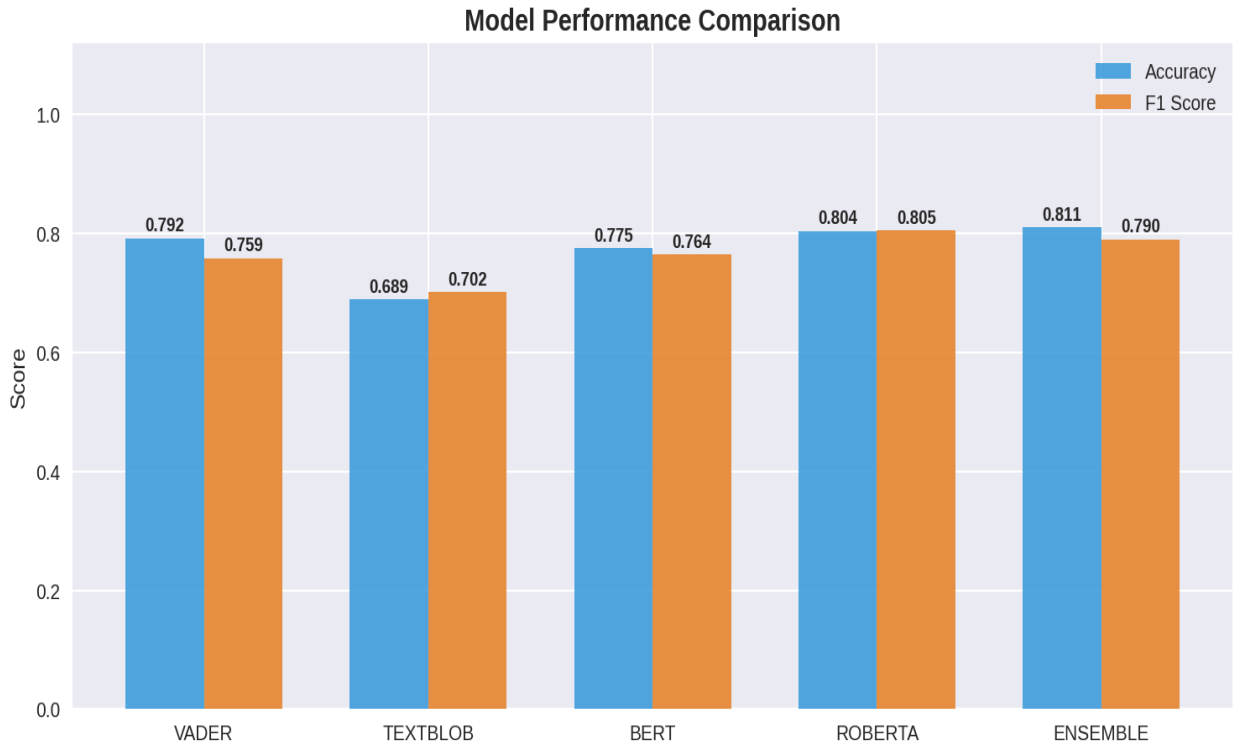
Confusion Matrix Textblob



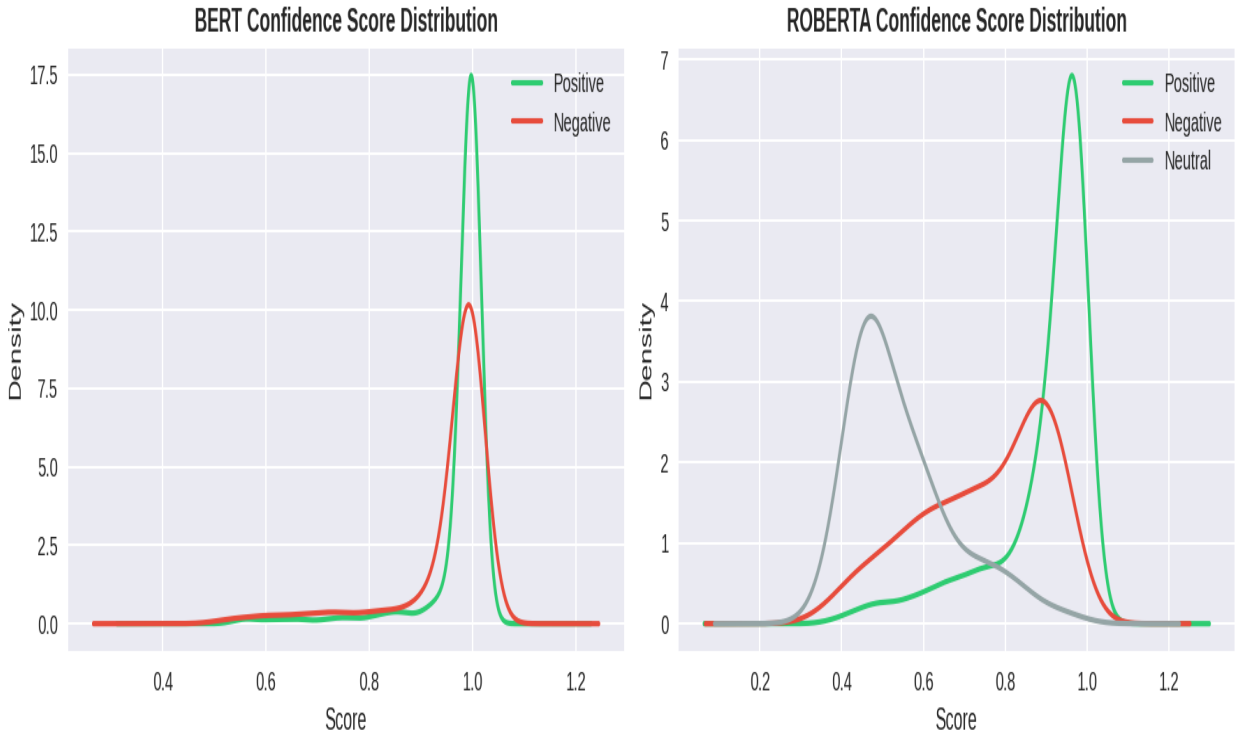
Confusion Matrix Vader



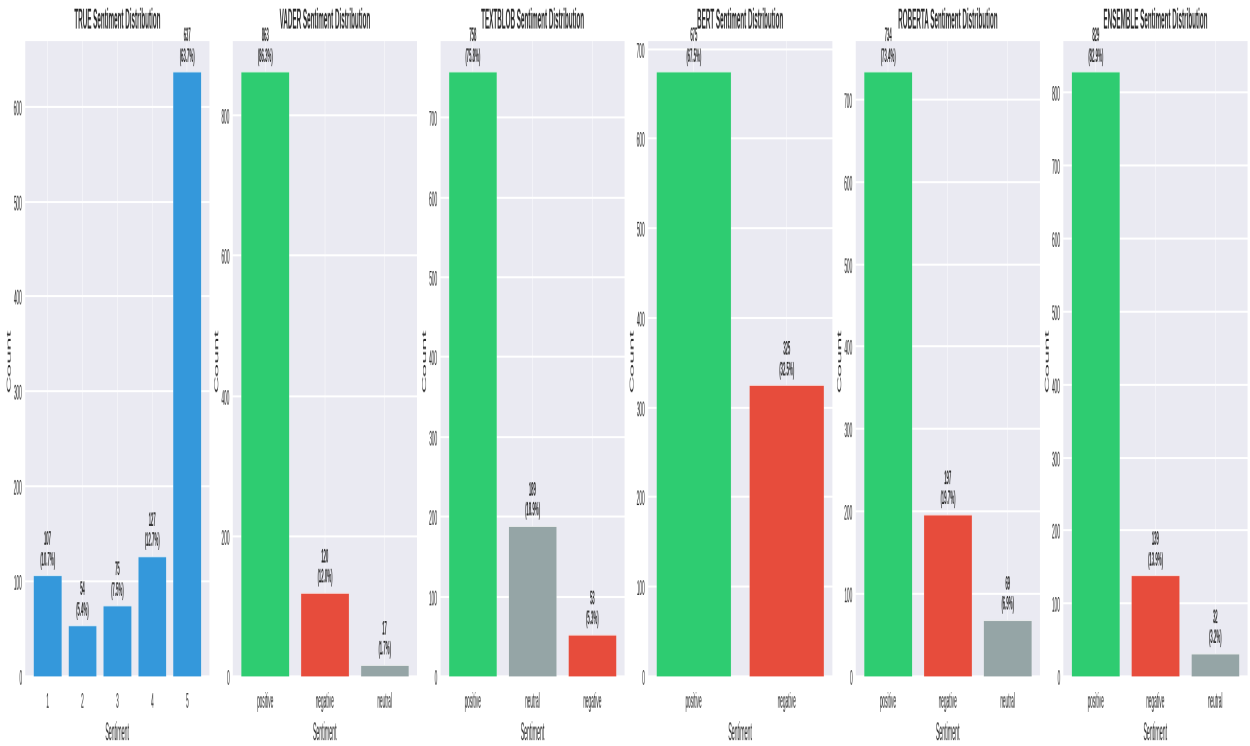
Model Comparison



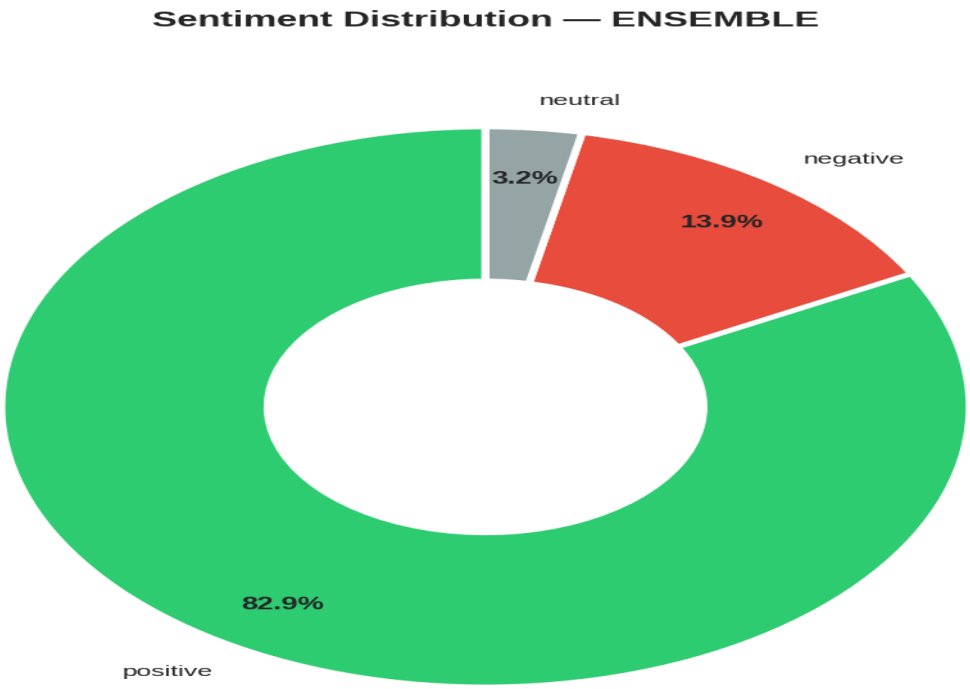
Score Distributions



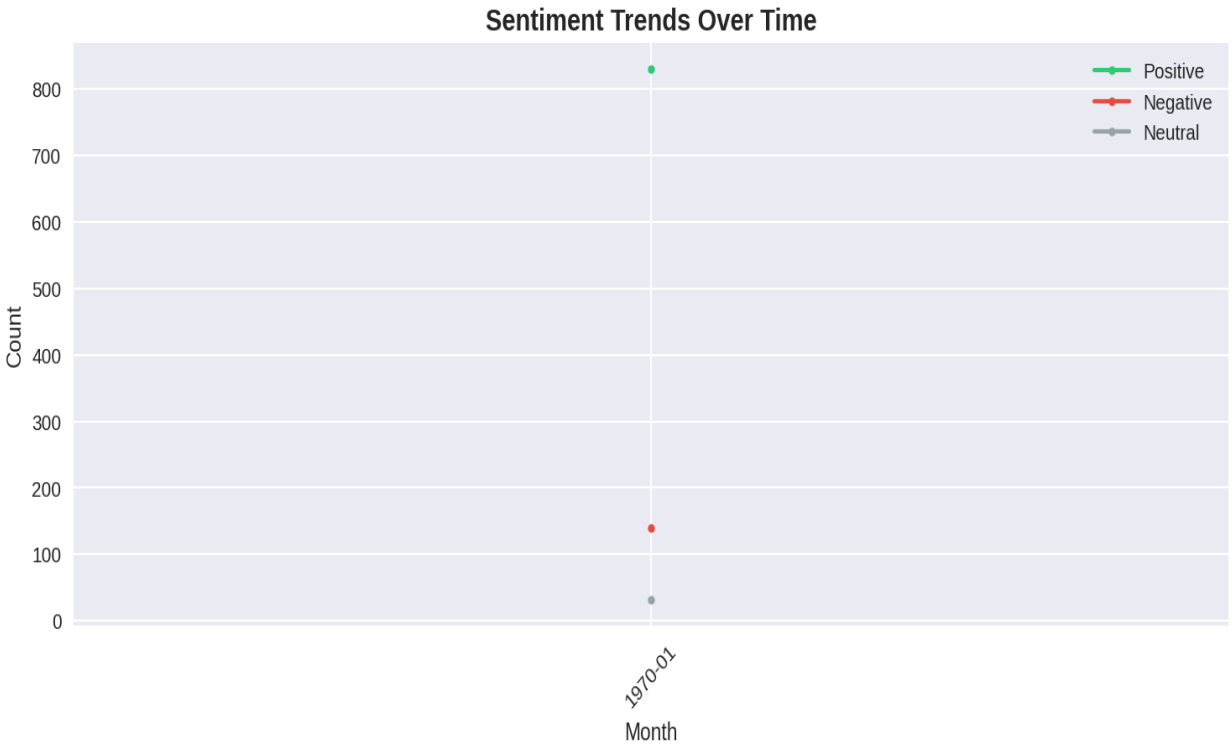
Sentiment Distribution



Sentiment Pie



Sentiment Timeline


Sentiment Trends Over Time
Positive
Negative
Neutral
800
700
600
500
400
300
200
100
0
Count
1970-01
Month

Word Clouds by Sentiment

Model Performance

Model	Accuracy	F1 Score
VADER	79.20%	0.7589
TEXTBLOB	68.90%	0.7018
BERT	77.50%	0.7642
ROBERTA	80.40%	0.8055
ENSEMBLE	81.10%	0.7900

VADER — Classification Report

```
precision recall f1-score support

negative 0.61 0.45 0.52 161
neutral 0.00 0.00 0.00 75
positive 0.83 0.94 0.88 764

accuracy 0.79 1000
macro avg 0.48 0.46 0.47 1000
weighted avg 0.73 0.79 0.76 1000
```

TEXTBLOB — Classification Report

```
precision recall f1-score support

negative 0.66 0.22 0.33 161
neutral 0.09 0.23 0.13 75
positive 0.84 0.83 0.84 764

accuracy 0.69 1000
macro avg 0.53 0.43 0.43 1000
weighted avg 0.76 0.69 0.70 1000
```

BERT — Classification Report

```
precision recall f1-score support

negative 0.45 0.91 0.60 161
neutral 0.00 0.00 0.00 75
positive 0.93 0.82 0.87 764

accuracy 0.78 1000
macro avg 0.46 0.58 0.49 1000
weighted avg 0.78 0.78 0.76 1000
```

ROBERTA — Classification Report

```
precision recall f1-score support

negative 0.62 0.76 0.69 161
neutral 0.13 0.12 0.12 75
positive 0.92 0.88 0.90 764

accuracy 0.80 1000
macro avg 0.56 0.59 0.57 1000
weighted avg 0.81 0.80 0.81 1000
```

ENSEMBLE — Classification Report

```
precision recall f1-score support

negative 0.68 0.58 0.63 161
neutral 0.09 0.04 0.06 75
positive 0.86 0.93 0.90 764

accuracy 0.81 1000
macro avg 0.54 0.52 0.53 1000
weighted avg 0.77 0.81 0.79 1000
```

Recommendations

1. **Leverage Positive Sentiment:** The overwhelmingly positive sentiment presents an opportunity to amplify success stories through marketing campaigns and customer testimonials.

2. **Continuous Monitoring:** Deploy this sentiment analysis pipeline as a recurring process to track trends and measure the impact of improvement initiatives.

Methodology

Data Processing: The analysis pipeline processed 1,000 text records with comprehensive preprocessing including tokenization, lemmatization, and stop-word removal. Text length was standardized to 512 characters for optimal model performance.

Models Deployed: Multiple state-of-the-art NLP models were employed:
• **VADER** (Valence Aware Dictionary and sEntiment Reasoner) — Rule-based lexicon model optimized for social media text
• **TextBlob** — Statistical pattern recognition using naive Bayes classification
• **DistilBERT** — Transformer-based deep learning model (distilled from BERT) fine-tuned on SST-2 sentiment dataset
• **RoBERTa** — Robustly optimized transformer architecture trained on Twitter sentiment data by Cardiff NLP

Ensemble Method: Final predictions were determined using majority voting across all models, providing robust and balanced sentiment classification.