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REVIEWER'S REPORT

Manuscript No.: **IJAR-54888** **Date**: 21-11-2025

Title: Comparing Sentiment Analysis Methods Flipkart Reviews

Recommendation:
Accept as it is .....
Accept after minor revision ...✓.....
Accept after major revision.....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	✓			
Techn. Quality		✓		
Clarity		✓		
Significance		✓		

Reviewer Name: **Sudhanshu Sekhar Tripathy**

Reviewer's Comment for Publication.

(*To be published with the manuscript in the journal*)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewer's name.

Reviewer's Comment for Publication

The manuscript presents a comprehensive comparative analysis of sentiment analysis techniques using machine learning, lexicon-based models, and large language models on Flipkart product reviews. The study is relevant to NLP, e-commerce analytics, and AI-based customer insight generation. The paper is well-written and offers valuable observations on the performance gaps between traditional models and LLMs. However, methodological clarity, statistical justification, and structural refinement are needed to improve scientific rigour.

Reviewer's Comment for Publication

Detailed Reviewer's Report

1. Scope & Relevance

The study addresses a timely and relevant problem in Natural Language Processing—sentiment analysis of e-commerce reviews using machine learning, lexicon-based methods, and Large Language Models (LLMs). The topic is highly relevant to the fields of artificial intelligence, data mining, and

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consumer behavior analytics. The comparison of traditional ML approaches with LLM-based sentiment classification strengthens the practical significance of the work. Overall, the scope aligns well with journal aims and current research trends.

2. Structure & Technical Presentation

The manuscript follows a logical structure with clear sections: Introduction, Literature Review, Methodology, Results, Discussion, and Conclusion. Tables and graphs are appropriately used to support findings. However, the introduction and related works contain redundancies, and some figures lack uniform formatting. The flow is good, but certain sections would benefit from tighter organization and concise presentation. Technical explanations are adequate but can be further streamlined for clarity.

3. Methodological / Analytical Details

The methodology is well-defined and demonstrates substantial implementation effort. Machine learning models are correctly applied using TF–IDF features, and evaluation metrics are appropriate. However:

- The use of TextBlob-generated labels requires stronger justification.
- Dataset imbalance is not handled statistically.
- Hyperparameters and training configurations for ML and LLM models are not fully detailed.
- No statistical significance testing is included for performance comparison.

  Despite these issues, the core analytical approach remains valid.

4. References & Citations

The references are relevant and cover traditional ML, NLP, and LLM studies. Citation density is good, but formatting inconsistencies are present. Some newer works (2022–2024) could be incorporated to strengthen academic rigor. A few references could be condensed or replaced with more recent research.

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5. Language & Style

The manuscript is written in generally clear and understandable English. Minor grammatical errors and stylistic inconsistencies appear throughout. Some sentences are lengthy and overly descriptive, affecting readability. Improving academic tone and proofreading the text would enhance clarity and professionalism.

6. Key Strengths

- Strong practical relevance with real-world e-commerce data.
- Comprehensive comparison across ML, lexicon-based, and LLM approaches.
- Clear visualization of results (confusion matrices, performance tables).
- Valuable observation on LLM underperformance without fine-tuning.
- Well-defined workflow demonstrating understanding of NLP processes.

7. Areas for Improvement

- Streamline introduction and literature review to avoid repetition.
- Provide stronger rationale for automatic labeling with TextBlob.
- Address dataset imbalance or justify its impact.
- Add detailed hyper parameter descriptions for reproducibility.
- Improve visual consistency in figures and tables.
- Include statistical validation of performance differences.
- Enhance language accuracy and conciseness.

8. Final Feedback

The paper presents a meaningful and well-executed comparison of sentiment analysis techniques using real e-commerce data. The results provide practical insights into the strengths and limitations of traditional ML approaches versus modern LLMs. With improvements in methodological clarity, structural refinement, and language polishing, the manuscript can achieve strong publication quality.