

Artificial Intelligence and Sentiment Analysis: Advancing Opportunities in Marketing Research

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1. Introduction and background

Sentiment analysis (SA), a computational technique for extracting and classifying subjective information from large-scale textual data, is transforming marketing research. By leveraging Artificial Intelligence (AI) and Natural Language Processing (NLP), SA enables real-time analysis of consumer attitudes and emotions, offering an efficient alternative to traditional survey-based methods (Mao et al., 2024). Initially rooted in lexicon-based approaches, SA has rapidly advanced through machine learning and deep learning models capable of capturing nuanced consumer emotions (Cui et al., 2023; Ghatora et al., 2024). It processes unstructured data from social media, reviews, and forums with increasing accuracy (Aunugu et al., 2025), supporting proactive marketing, real-time reputation management, and campaign optimization (Noranee & Bin Othman, 2023; Paturi, 2025; Lodhi & Singh, 2025). In contrast, traditional methods such as surveys and interviews, face persistent issues such as recall and social desirability bias, low response rates, limited emotional granularity, and inability to capture evolving sentiments. SA overcomes many of these limitations by analyzing unsolicited, large-scale, real-time data. Despite growing use in marketing practice, SA remains underutilized in academic marketing research. This paper critically examines SA opportunities and challenges in marketing research, positioning it as both a complementary and alternative methodological tool. It proposes a structured framework to integrate SA into research designs, covering methodological steps, ethics, training, and domain applications.

2. Evolution of sentiment analysis

Initially, SA employed lexicon-based polarity classification (positive, negative and neutral). Advances in ML and deep learning, including transformers, now detect sarcasm, irony, and subtle emotions (Cui et al., 2023; Ghatora et al., 2024). These developments

have transformed SA into a mainstream analytical tool across industries, including marketing (Mao et al., 2024).

3. Advantages of sentiment analysis in marketing research

The scale of consumer-generated data is unprecedented: research into TikTok usage estimated that the platform produced approximately 117 million posts daily; Storywrangler has processed over 100 billion tweets; Yelp receives tens of thousands of reviews per minute; and Tripadvisor hosts over a billion reviews. Surveys, by contrast, rely on small, static samples. SA taps into this real-time reservoir for timely and authentic insights. Key advantages include access to large authentic datasets, real-time monitoring, granular emotional analysis, reduced response bias, cost-effectiveness through automation, and expanding cross-cultural reach via multilingual NLP. Despite this massive flow of content, the majority remains underexploited in academic marketing research. Most survey-based studies collect data from a few hundred or at best a few thousand respondents

Table 1: SA vs Traditional Surveys

Feature	Sentiment Analysis	Traditional Surveys
Data Volume	Millions–billions	Hundreds–thousands
Insights	Continuous, real-time	Static, point-in-time
Bias	Reduced	High (recall/social desirability)
Cost	Scalable	High for large samples
Emotional Nuance	Detects subtle emotions	Limited
Cross-Cultural	Expanding	Resource-intensive

4. Technical challenges and ethical considerations

SA faces significant challenges. Technically, sarcasm and implicit sentiment remain difficult to detect, multiclass classification is complex, language diversity demands adaptable models, and high-quality training data are essential (Mao et al., 2024). Many marketing researchers also face expertise gaps, lacking skills in NLP, model selection, and data handling, which limits the effective use of advanced tools such as GPT and ABSA. Ethically, scraping data without consent raises privacy concerns, algorithmic biases can perpetuate prejudice, and lack of transparency undermines trust. Addressing these challenges requires robust ethical frameworks, transparent reporting, improved technical

methodologies, compliance with data protection regulations (Ferrara, 2024), and targeted researcher training.

5. Methodological framework for SA in marketing research

Integrating SA into marketing research involves a structured yet flexible approach. The process begins by defining clear research questions, selecting appropriate data sources such as social media or e-commerce platforms, and ensuring legal compliance. Data are collected through APIs or scraping, then preprocessed to remove noise. Depending on complexity, lexicon-based methods, machine learning classifiers, or deep learning models can be applied. Results are analyzed and visualized to reveal patterns, and insights are interpreted in light of the research objectives. Findings can then inform strategic decisions, with potential for real-time monitoring in dynamic contexts.

6. Building researcher capabilities

To adopt SA effectively, marketing researchers need technical, analytical, and ethical competencies. Training in NLP foundations, machine and deep learning methods, big data collection, and visualization tools is essential, alongside understanding legal and ethical standards like GDPR. Practical workshops using platforms can bridge theory and practice, enabling researchers to apply SA rigorously and responsibly.

7. Applications across domains

SA versatility spans business, social media, healthcare, finance, CRM, and cultural research. In e-commerce, it informs product strategies through large-scale review analysis. In social media, it enables real-time opinion monitoring. In healthcare, it interprets patient sentiment, whereas in finance, it aids market prediction. In CRM, it could strengthen loyalty strategies. Multilingual analysis and large language models further extend its reach, making SA a powerful methodological addition to marketing research.

8. Conclusion and future directions

AI-driven SA is reshaping marketing research by providing scalable, dynamic, and nuanced insights that address survey limitations. Integrating SA with traditional methods produces richer consumer intelligence. Future research should enhance algorithmic contextual understanding, multilingual analysis, adaptive modeling, researcher training, and ethical practices, positioning SA as a cornerstone of modern marketing scholarship.

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