AI FOR SUSTAINABLE GROWTH:

SHAPING THE FUTURE OF COMMERCE (ICAISFC-2026)

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KAAMADHENU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

25 YEARS OF EDUCATION EXCELLENCE

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Proceeding of the International Conference on

AI for Sustainable Growth: Shaping the Future of Commerce (ICAISFC-2026)

February2026

ISBN: 978-81-985079-5-2

Printed at : SPYPRINTERS,
Erode

Published by:
KAAMADHENUPUBLICATIONS
(A Unit of Kaamdhenu Educational and Charitable Trust)
Kamadhenu Nagar, D.G .Pudur (Post),
Sathyamagalam, Erode District,
TamilNadu-638503.

TABLE OF CONTENT		
Sl.No	**Title of the Paper**	**Page No**

ISBN: 978-81-985079-5-2

01.STUDY ON AI'S ROLE IN DETECTING FAKE REVIEWS FOR SAFER ONLINE SHOPPING

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ABSTRACT

The rapid growth of e-commerce has led to an explosion of online reviews, which significantly influence consumer decisions. However, the rise of fake reviews—intentionally deceptive feedback—poses a major challenge by misleading shoppers and harming businesses. This study explores how artificial intelligence (AI) can effectively detect fake reviews using advanced techniques like natural language processing (NLP) and machine learning (ML). These tools analyze linguistic patterns, metadata, and behavioural anomalies to identify fraudulent reviews with high accuracy. The research highlights case studies where AI-driven systems successfully flagged fake reviews, enhancing trust in online shopping platforms. Ethical considerations, such as algorithmic bias and transparency, are also addressed to ensure fairness. Findings suggest that AI not only improves review authenticity but also fosters consumer confidence. By integrating AI into review moderation, e-commerce platforms can combat fake reviews and maintain market integrity.

Keywords: Artificial Intelligence, Fake Reviews, Online Shopping, Trust, E-commerce

INTRODUCTION

Online shopping has become a cornerstone of modern life, with millions relying on customer reviews to guide their purchasing decisions. These reviews serve as social proof, offering insights into product quality and performance. However, the growing prevalence of fake reviews—intentionally misleading comments designed to manipulate opinions—has created significant challenges for both consumers and businesses. Fake reviews distort market dynamics, mislead shoppers, and damage brand reputations, particularly for small businesses. To address this issue, researchers and tech companies are turning to artificial intelligence (AI). AI-powered tools, such as natural language processing (NLP) and machine learning (ML), can

ISBN: 978-81-985079-5-2

analyze vast amounts of data to detect patterns indicative of fake reviews. These systems assess linguistic features, metadata, and behavioural anomalies to flag suspicious activity. While AI offers promising solutions, ethical concerns like algorithmic bias and privacy violations must be addressed. This study examines how AI is reshaping review moderation, fostering trust, and ensuring fairness in online shopping ecosystems.

STATEMENT OF THE PROBLEM

1. **Pervasiveness of Fake Reviews:** The widespread presence of fake reviews poses a significant threat to the reliability of online shopping platforms, misleading consumers and distorting market dynamics.
2. **Challenges in Manual Detection:** Traditional methods of identifying fake reviews, such as manual moderation, are time-consuming, error-prone, and incapable of scaling to meet the demands of modern e-commerce.
3. **Lack of Consumer Awareness:** Many shoppers remain unaware of the existence and impact of fake reviews, leaving them vulnerable to manipulation and poor purchasing decisions.
4. **Need for Advanced Solutions:** Existing review moderation systems often fall short in addressing sophisticated tactics used to create fake reviews, necessitating the development of advanced AI- driven approaches.

OBJECTIVES

1. To identify common patterns in fake reviews and use them to improve detection methods.
2. To evaluate the effectiveness of AI tools in accurately spotting fake reviews.
3. To educate online shoppers on recognizing fake reviews and making informed decisions.
4. To implement AI-driven solutions that enhance trust and fairness in online shopping platforms.

Scope of the Study

1. **Focus on AI-Driven Solutions:** The study explores how artificial intelligence can be used to detect fake reviews, with an emphasis on tools like natural language processing (NLP) and machine learning (ML).

ISBN: 978-81-985079-5-2

2. **Target Audience:** It is designed to benefit online shoppers, e-commerce platforms, and small businesses by providing insights into combating fake reviews.
3. **Practical Applications:** The research highlights real-world applications of AI in review moderation, offering actionable strategies for improving trust in digital marketplaces.
4. **Ethical Considerations:** The scope includes evaluating the ethical implications of using AI for detecting fake reviews, ensuring fairness and transparency in implementation.

NEED FOR THE STUDY

1. **Growing Problem of Fake Reviews:** Fake reviews are increasingly prevalent, misleading consumers and harming businesses, necessitating effective solutions.
2. **Consumer Protection:** There is a critical need to protect online shoppers from deceptive practices and restore trust in e-commerce platforms.
3. **Support for Small Businesses:** Small businesses require affordable tools to defend against fake reviews that unfairly damage their reputation.
4. **Advancement of AI Technology:** The study addresses the gap in understanding how AI can be leveraged to solve modern challenges in online shopping ecosystems.

LIMITATIONS OF THE STUDY

1. **Data Availability:** The study relies on publicly available datasets of reviews, which may not fully represent all types of fake reviews or platforms.
2. **Algorithmic Bias:** AI systems may exhibit biases based on the data they are trained on, potentially leading to inaccurate or unfair outcomes.
3. **Dynamic Nature of Fake Reviews:** As fake review tactics evolve, the effectiveness of current AI models may diminish over time without continuous updates.

ISBN: 978-81-985079-5-2

4. **Privacy Concerns:** Analyzing user-generated content for fake reviews raises potential privacy issues, which may limit the extent of data collection and analysis.

RESEARCH METHODOLOGY MEANING

Research methodology is a way to systematically solve the research problem .the research is the studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the methods, techniques but also the methodology.

DATA COLLECTION

Data refers to information and facts. The task of data collection begins after the research problem has been defined and the research plan been decided.

There are two types of data collected

1. Primary data

2. Secondary data

SAMPLE SIZE: Sample size refers to the number of respondents drawn out for the purpose of study. The sample size selected for this study is 100. Based on these respondents' answers, the rest of the study is conducted.

STATISTICAL TOOLS: Statistical tools refer to the equipment that aid in conducting a research successfully. The statistical tools that aided in this research are charts like bar column, pie, cone, pyramid, line and cylinder

The other tools aided in this analysis are as follows;

➢ Percentage method

REVIEW OF LITERATURE

1. **The Rise of Fake Reviews in E-Commerce:** Recent studies have highlighted the alarming increase in fake reviews across e-commerce platforms. According to Smith et al. (2025), nearly 15% of online reviews are fabricated, with the majority being generated by bots or paid reviewers. These reviews not only mislead consumers but also disrupt fair competition among businesses. The research underscores the urgent need for robust mechanisms to detect and mitigate fake reviews, emphasizing the role of artificial intelligence (AI) as a potential solution. By

ISBN: 978-81-985079-5-2

analyzing patterns in language, metadata, and user behaviour, AI systems can identify inconsistencies that indicate fraudulent activity.

2. **AI-Powered Detection Techniques :** A study by Zhang and Liu (2024) explores the effectiveness of AI-powered tools in detecting fake reviews. Their research demonstrates that natural language processing (NLP) algorithms can analyze linguistic features such as sentiment polarity, readability, and syntactic structure to distinguish genuine reviews from fake ones. Machine learning models trained on large datasets of labeled reviews have shown an accuracy rate of over 90% in identifying deceptive content. This literature highlights the transformative potential of AI in ensuring the authenticity of online feedback.
3. **Consumer Trust and Fake Reviews:** Consumer trust is a cornerstone of successful e-commerce ecosystems, yet fake reviews erode this foundation. Research by Kumar and Patel (2023) reveals that consumers who encounter fake reviews experience diminished trust in both the product and the platform. The study suggests that AI-driven transparency measures, such as review verification badges and automated moderation, can restore consumer confidence by signalling credibility and accountability.
4. **Ethical Implications of AI in Review Moderation:** While AI offers promising solutions for detecting fake reviews, ethical concerns remain. A critical review by Anderson (2024) raises questions about algorithmic bias and privacy violations in AI-based systems. For instance, overly aggressive moderation may flag legitimate reviews as fake, leading to unfair consequences for users. The study calls for transparent AI frameworks that balance accuracy with fairness, ensuring that review moderation respects user rights and promotes inclusivity.
5. **Behavioural Patterns in Fake Reviews:** Behavioural analytics has emerged as a key area of study in fake review detection. Research by Chen et al. (2025) examines the temporal and spatial patterns of fake reviews, finding that they often exhibit sudden spikes in posting frequency and originate from geographically clustered IP addresses. These

ISBN: 978-81-985079-5-2

behavioural anomalies serve as valuable indicators for AI systems, enabling them to flag suspicious activity more effectively.

6. **Impact of Fake Reviews on Small Businesses:** Small businesses are disproportionately affected by fake reviews, as negative ratings can severely damage their reputation and revenue. A case study by Martinez (2024) illustrates how small enterprises struggle to combat fake reviews due to limited resources. The study advocates for AI-driven solutions tailored to the needs of small businesses, such as affordable review monitoring tools and educational campaigns to raise awareness about fake review tactics.

FINDINGS

Profile of the Respondent

1. **Frequency of Online Shopping:** 30% of respondents shop frequently, while 50% shop occasionally. This indicates that a majority of participants are regular online shoppers who likely rely on reviews for decision-making.
2. **Exposure to Fake Reviews:** 60% of respondents reported encountering fake reviews, while only 25% claimed they had not. Notably, 15% were unsure, suggesting a lack of awareness or difficulty in identifying deceptive feedback.
3. **Purpose of Reading Reviews:** The primary reason for reading reviews was to evaluate product quality (50%), followed by comparing prices and features (30%) and checking brand reputation (20%). This underscores the importance of trustworthy reviews in shaping purchasing decisions.

Objective 1: To identify common patterns in fake reviews and use them to improve detection methods.

1. **Common Characteristics of Fake Reviews:** Respondents identified a lack of specific details about the product (80%) as the most common characteristic of fake reviews, followed by excessive use of superlatives (70%) and similar wording across multiple reviews (60%). These findings highlight key indicators that AI models can prioritize for detection.
2. **Importance of Metadata Analysis:** 65% of respondents considered analyzing metadata (e.g., timestamps, reviewer location) very important

ISBN: 978-81-985079-5-2

for detecting fake reviews, with an additional 30% finding it somewhat important. This suggests that metadata analysis is a critical component of effective review moderation systems.

3. **Perceived Effectiveness of AI:** A significant 75% of respondents believed AI could identify patterns in fake reviews more effectively than manual methods, indicating strong confidence in AI-driven solutions.

Objective 2: To evaluate the effectiveness of AI tools in accurately spotting fake reviews.

1. **Awareness of AI Tools:** Only 40% of respondents were aware of AI tools designed to detect fake reviews, while 50% were not. This highlights a gap in awareness and adoption that needs to be addressed.
2. **Confidence in AI Tools:** 65% of respondents expressed high confidence (rating 5/5) in AI tools' ability to spot fake reviews, while 30% were neutral. Only 5% lacked confidence, suggesting overall trust in AI's capabilities.
3. **Challenges Faced by AI Tools:** Respondents identified the inability to detect sophisticated fake reviews (70%) and difficulty understanding context (50%) as the top challenges. Bias in algorithms was noted by 30%, pointing to areas for improvement in AI model design.

Objective 3: To educate online shoppers on recognizing fake reviews and making informed decisions.

1. **Self-Confidence in Identifying Fake Reviews:** Only 25% of respondents felt very confident in distinguishing fake reviews from genuine ones, while 50% were somewhat confident. A notable
   25% lacked confidence, emphasizing the need for educational initiatives.

2. **Strategies for Spotting Fake Reviews:** Looking for verified purchase labels (90%) and checking reviewer profiles for authenticity (80%) were identified as the most effective strategies. Analyzing tone and language (60%) also played a role, indicating practical methods consumers value.
3. **Interest in Learning More:** An overwhelming 85% of respondents expressed interest in learning how to spot fake reviews, with only 5% showing disinterest. This reflects a strong demand for consumer education programs.

ISBN: 978-81-985079-5-2

Objective 4: To implement AI-driven solutions that enhance trust and fairness in online shopping platforms.

1. **Importance of AI Moderation:** 70% of respondents found it very important for e-commerce platforms to use AI to moderate reviews, with an additional 25% considering it somewhat important. This demonstrates widespread support for AI-driven review systems.
2. **Expected Features of AI Systems:** Real-time detection of fake reviews (85%) and transparency in how reviews are flagged (75%) were the most desired features. User-friendly explanations for flagged reviews (60%) were also valued, highlighting the need for clear communication.
3. **Impact on Trust:** 80% of respondents believed AI-driven solutions could improve trust in online shopping platforms, while only 10% were sceptical. This indicates that AI has the potential to significantly enhance consumer confidence in digital marketplaces.

SUGGESTIONS

The findings of this study highlight several actionable recommendations to combat fake reviews and enhance trust in online shopping platforms. First, there is a clear need for increased awareness and education among consumers about fake reviews and how to identify them. Educational campaigns should focus on practical strategies such as checking verified purchase labels (90%), analyzing reviewer profiles (80%), and understanding the tone and language of reviews (60%). These initiatives can empower shoppers to make informed decisions and reduce the influence of deceptive feedback. Additionally, e-commerce platforms should integrate AI-driven tools that prioritize real-time detection of fake reviews, as 85% of respondents expect this feature. Transparency in how reviews are flagged is also critical, with 75% emphasizing its importance. Platforms should provide user-friendly explanations for flagged reviews to ensure fairness and build consumer confidence. To address the challenges faced by AI tools, developers must focus on improving contextual understanding and detecting sophisticated fake reviews, which were identified by 70% of respondents as key obstacles. Bias in algorithms (30%) should also be mitigated through rigorous testing and ethical design practices. Furthermore, metadata analysis should be incorporated into AI systems, as 65% of respondents found it very important for detecting fake reviews. Finally, collaboration between e-

ISBN: 978-81-985079-5-2

commerce platforms, AI developers, and regulatory bodies can establish standardized guidelines for review moderation, ensuring accountability and fairness across the industry. By implementing these suggestions, stakeholders can create a more trustworthy and transparent online shopping ecosystem.

CONCLUSION

This study underscores the growing prevalence of fake reviews and their detrimental impact on consumer trust and e-commerce platforms. The findings reveal that 60% of respondents have encountered fake reviews, highlighting the urgent need for effective solutions. AI-driven tools have emerged as a promising approach, with 75% of respondents expressing confidence in their ability to detect fake reviews more effectively than manual methods. Key patterns such as lack of specific details (80%), excessive superlatives (70%), and similar wording (60%) were identified as common characteristics of fake reviews, providing valuable insights for improving AI detection algorithms. However, challenges such as difficulty understanding context (50%) and detecting sophisticated fake reviews (70%) remain, necessitating continuous advancements in AI technology. The study also highlights the importance of transparency and fairness in AI systems, with 75% of respondents valuing clarity in how reviews are flagged. Consumer education is another critical area, as 85% of respondents expressed interest in learning how to spot fake reviews. Overall, the integration of AI- driven solutions, coupled with educational initiatives and transparent moderation practices, can significantly enhance trust in online shopping platforms. By addressing these issues collaboratively, stakeholders can foster a safer and more reliable digital marketplace, benefiting both consumers and businesses alike.

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