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Fake/Irrelevent Product Review Monitoring

Meera Sawalkar[1]; T. M. Mane[2]; Rushikesh Kenjale[3]; Tushar Gadekar[4]; Jayprakash Jadhav[5]; Atharva More[6]; Atharva Phadatare[7]

[1,2]Deepartment of Computer Engineering JSPM's Rajarshi Shahu School of Engineering and Research, Pune, Maharashtra, India
[3,4,5,6,7]BE Students, Computer Engineering, JSPM's Rajarshi Shahu School of Engineering and Research, Pune, Maharashtra, India.

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Abstract: In the digital age, online reviews significantly influence consumer behavior and business reputation. However, the rise of fake and irrelevant reviews has become a growing concern, affecting the credibility of e-commerce platforms and misleading potential customers. This research presents a comprehensive AI/ML-based system designed to detect and filter out such deceptive content. The system leverages natural language processing (NLP) techniques and a Markov Chain Model to identify gibberish or contextually irrelevant text. It also integrates image verification by analyzing EXIF metadata to validate whether submitted review images are authentic and correspond to the product in question. By combining structured review analysis with machine learning models and metadata validation, the system enhances the reliability of online feedback. This solution not only helps e-commerce platforms maintain content integrity but also builds greater trust among users, ultimately supporting more informed purchasing decisions.

Keywords: *NLP, AI-ML, Review Monitoring, Fake Review Detection, Spam Review Detection, Markov Model.*

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I. INTRODUCTION

Online reviews have become a cornerstone of decision-making for consumers in the e-commerce landscape. Buyers often rely on product reviews and ratings to assess the quality, usability, and authenticity of items before making a purchase. However, the growing trend of fake and irrelevant reviews—often generated to manipulate product perception—poses a serious challenge to the credibility and trustworthiness of online platforms.

Fake reviews may be created by bots, incentivized users, or competitors aiming to distort public opinion. Irrelevant reviews, though not intentionally misleading, often contain off-topic, gibberish, or non-informative content, further deteriorating the quality of information available to end-users. Both types reduce user confidence and can lead to poor customer experiences and financial losses for businesses.

This paper presents a practical solution that combines Natural Language Processing (NLP), Machine Learning (ML), and image metadata verification techniques to identify and filter out such reviews. Our approach uses the Markov Chain Model to detect nonsensical or gibberish text, and a contextual classification algorithm to assess the relevance of the review with respect to the product category. Additionally, if a user includes an image in the review, the system validates the image's authenticity by extracting and analyzing its EXIF metadata. Reviews that lack credible metadata or textual coherence are flagged as spam and routed to the admin dashboard for further action.

By implementing this hybrid detection system, we aim to assist e-commerce platforms in maintaining genuine user feedback, improving product transparency, and enhancing the overall customer trust and experience.

II. METHODOLOGY

In this project we have used a markove chain model and other methodologies to detect the spam and irrelevant review on the product details page. The proposed system is developed to detect and filter fake or irrelevant reviews submitted on an e-commerce platform, using machine learning and natural language processing techniques. The primary objective of the project is to ensure that reviews genuinely reflect the customer's experience with the product, thereby increasing consumer trust and helping businesses maintain the credibility of user feedback.

The system is designed to analyze both textual and visual (image-based) components of reviews. Reviews that are irrelevant, gibberish, or accompanied by unauthenticated

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images are identified and flagged automatically. The model acts as an intelligent review moderator, filtering out misleading content before it affects potential buyers or the platform's reputation.

The methodology leverages machine learning algorithms to evaluate the coherence and authenticity of textual reviews using contextual language models. For instance, if a user writes a review for a mobile phone but the content mentions unrelated topics like food or movies, the system recognizes this mismatch and labels the review as irrelevant or spam. This detection process is based on semantic similarity analysis between the product metadata and the review content, utilizing vector-based NLP models like TF-IDF, Word2Vec, or BERT for better contextual understanding.

For gibberish detection, the system incorporates a Markov Chain model trained on a corpus of standard English to detect illogical or random character sequences in user-generated text. If a review exhibits abnormal character transition probabilities, it is flagged as gibberish.

Additionally, when a user includes an image with a review, the system extracts its EXIF metadata—such as date, GPS location, and device information—to validate its authenticity. If the image lacks essential metadata or if tampering is detected, the review submission is rejected, or the image is flagged for manual verification. This image authenticity check helps prevent users from uploading irrelevant or stock images to manipulate product perception.

An admin dashboard is also integrated into the platform, where flagged reviews can be reviewed, approved, or deleted. This enables human oversight for edge cases and ensures continuous learning for the system based on admin feedback.

The backend is developed using Node.js, and the database is built on MongoDB to store user information, reviews, and metadata. The frontend, designed using React.js, provides an interactive interface for both users and administrators. The ML models are either integrated as APIs or loaded into memory to allow real-time detection without performance bottlenecks.

By combining natural language processing, metadata validation, and contextual understanding, the proposed system provides a scalable and reliable solution for enhancing the quality of online reviews. This proactive approach helps e-commerce platforms minimize misinformation, improve product credibility, and ultimately support better customer decision-making.

III. MODELS AND ITS IMPLEMENTATION

➢ *System Operations*

The system operations module handles the core backend logic, integrating machine learning models, metadata analysis, and review management.

- *Review Analysis Engine*

This module processes user-submitted textual reviews using Natural Language Processing (NLP) techniques. It performs semantic matching between the product description and review content to detect irrelevant or spam reviews. Machine learning models such as TF-IDF and Markov Chains are used to detect gibberish or low-context reviews.

- *EXIF Metadata Validator*

When a user attaches an image to a review, this module extracts EXIF metadata including date, time, GPS location, and device model. Reviews containing images with missing or suspicious metadata are either rejected or flagged for admin verification.

- *Spam Classification Model*

This module is responsible for flagging reviews as legitimate or spam based on predefined thresholds from ML models. Spam reviews are stored in a separate section of the database for admin moderation.

- *Admin Dashboard Interface*

Enables administrators to view, or delete flagged reviews.

➢ *User Operations*

The user operations module facilitates user interaction with the e-commerce platform for review submission and browsing.

- *Product Review Submission Interface*

Allows users to write textual reviews and optionally upload images. Displays real-time validation results if the review is marked as potentially irrelevant or the image fails authenticity checks.

- *User Authentication Module*

Handles registration and login functionality. Ensures that only verified users can post reviews, reducing bot-generated spam.

- *Review Feedback and Transparency*

Users are informed whether their review has been accepted or flagged and can modify it accordingly. Promotes user trust by offering feedback on why a review was considered irrelevant.

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IV. GUI IMPLEMENTATION

➢ *Login Page*

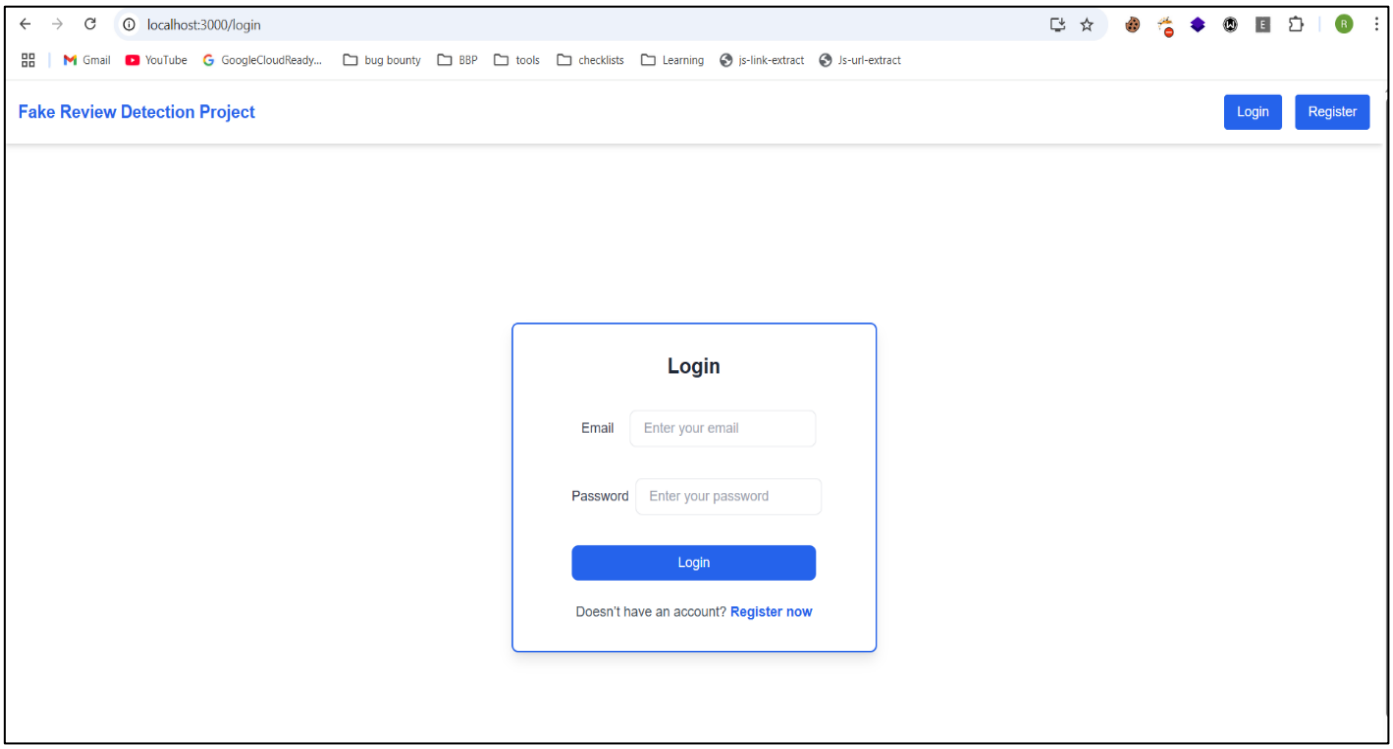

Fig 1 Login Page

➢ *Product Details and Review Submit Page*

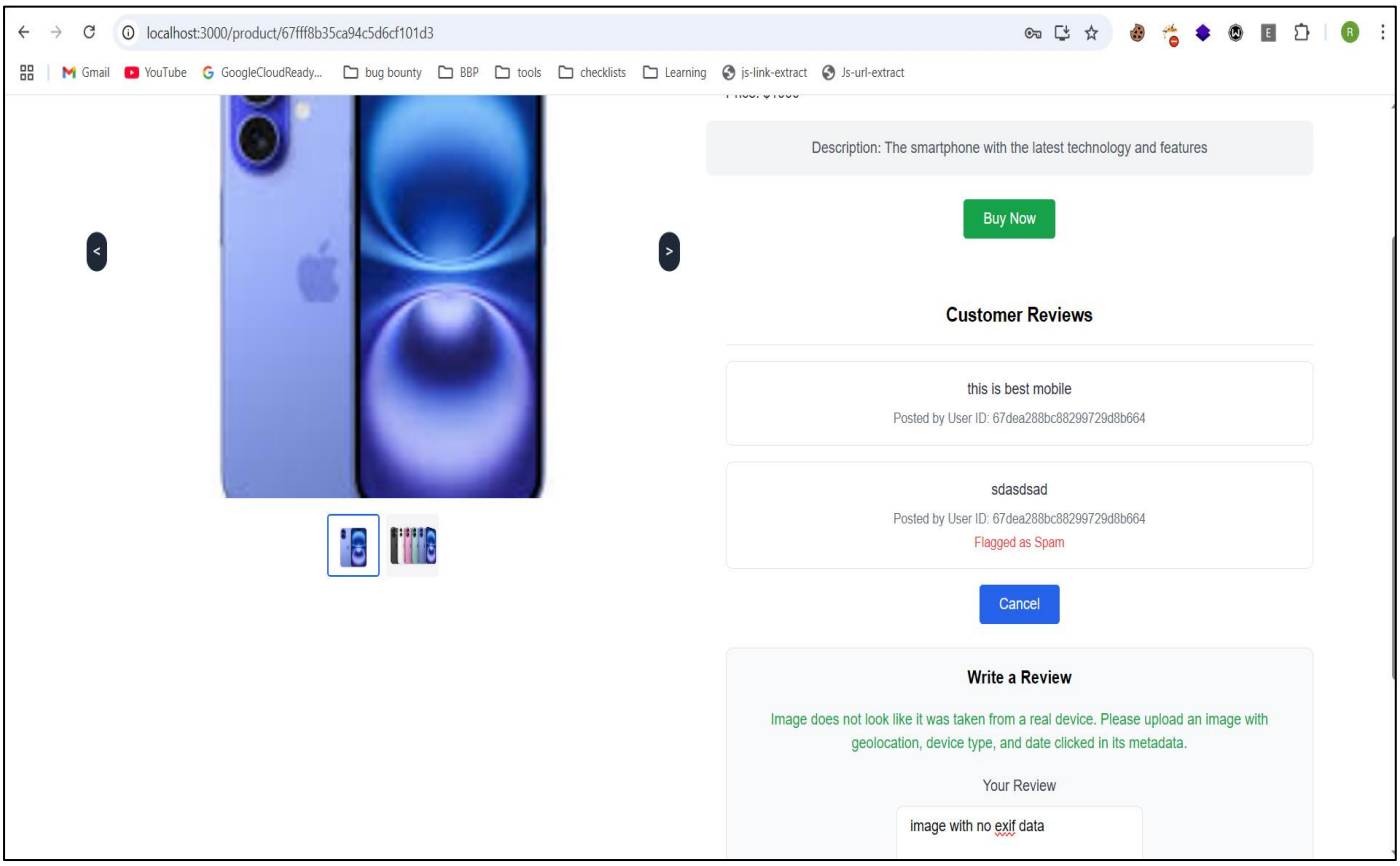

Fig 2 Product Details and Review Submit Page

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➢ *Admin Dashboard*

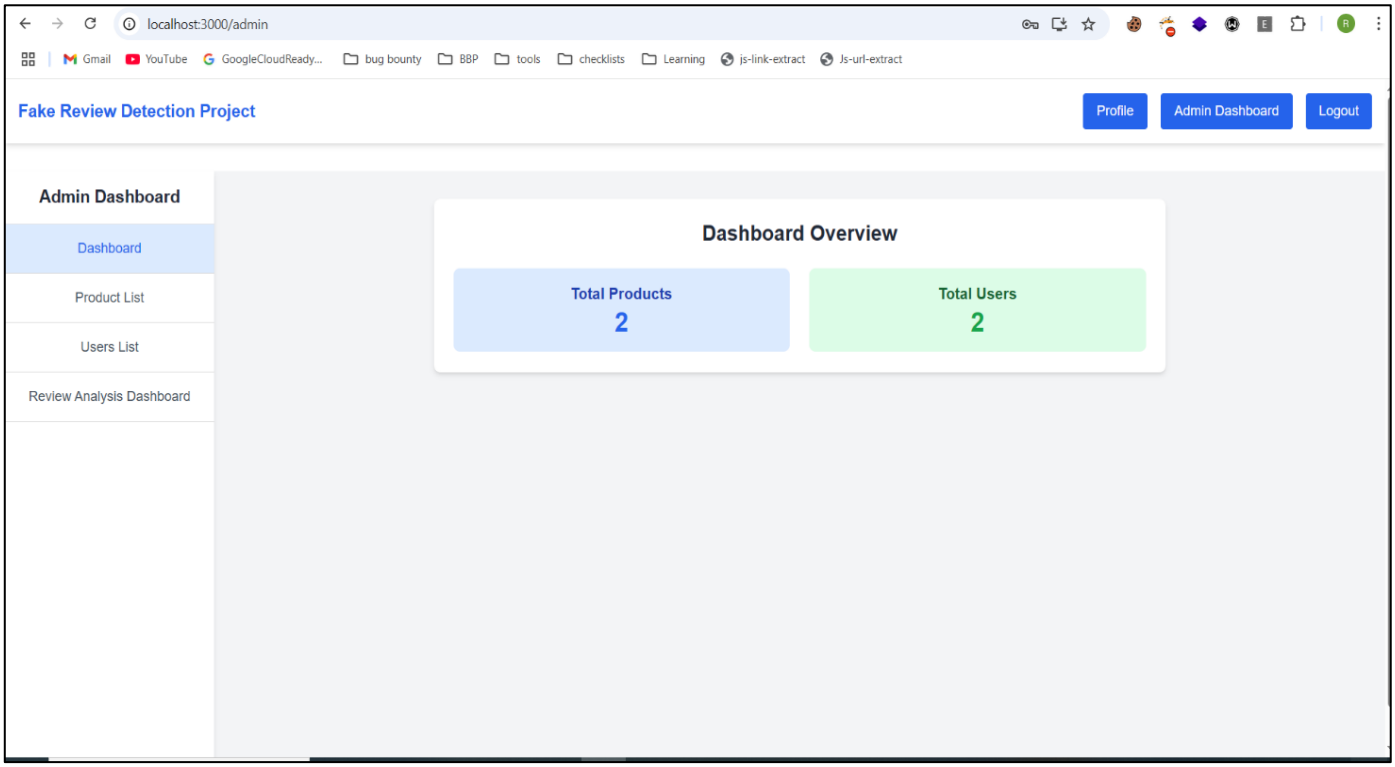

Fig 3 Admin Dashboard

➢ *Review Dashboard*

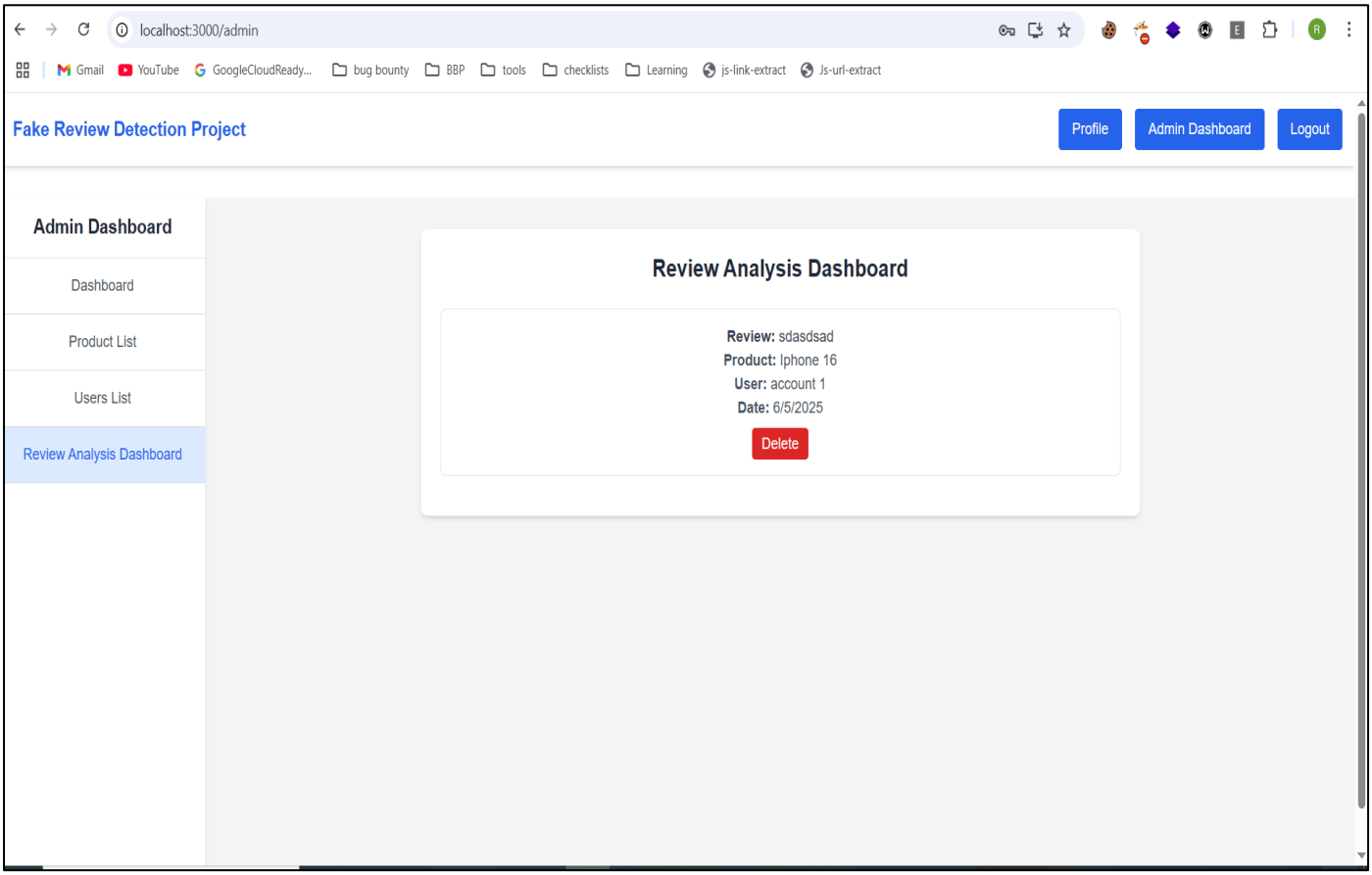

Fig 4 Review Dashboard

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V. CONCLUSION

The proposed system for Fake/Irrelevant Review Detection Using AI/ML presents an effective and intelligent solution to a growing problem in modern e-commerce platforms—misleading or irrelevant customer reviews. These reviews can significantly distort buyer perceptions, reduce trust, and ultimately affect purchasing decisions and business credibility. By integrating Natural Language Processing (NLP), Machine Learning (ML) models like Markov Chains for gibberish detection, and EXIF metadata validation for image authenticity, the system goes beyond conventional review moderation techniques. It not only filters out nonsensical and irrelevant text reviews but also ensures the integrity of images submitted alongside the reviews. The use of MongoDB as a backend storage solution ensures scalability, performance, and efficient querying of user, product, and review data. The application also features a responsive admin dashboard that empowers moderators with insights into flagged content, offering a balance between automation and human oversight. This hybrid approach makes the system practical for real-world use in large-scale e-commerce environments. Overall, this project enhances the quality and trustworthiness of user-generated content on e-commerce platforms. It benefits both users, by providing genuine feedback to base their decisions on, and businesses, by protecting their reputation and promoting fair product evaluation.

FUTURE SCOPE

The proposed system lays a strong foundation for automated fake and irrelevant review detection, but there are several avenues for future enhancements and broader applicability:

- *Multilingual Review Detection*

Currently, the system processes English-language reviews. Future work can extend detection capabilities to include multiple languages using advanced multilingual NLP models such as XLM-RoBERTa or mBERT, enabling broader usage across global platforms.

- *Deeper Semantic Analysis*

The current models primarily detect gibberish or context mismatch. Future upgrades can incorporate semantic similarity algorithms and sentiment consistency checks between the review text and the product category to capture subtle cases of review irrelevance or deception.

- *Image Content Verification using AI*

While EXIF metadata validation is effective for identifying basic image authenticity, integrating image classification or object detection models (e.g., YOLO, CLIP) can allow the system to visually verify whether the uploaded image matches the product being reviewed.

- *User Behavior-Based Anomaly Detection*

Future versions can incorporate behavioral analytics to detect patterns in suspicious user activity—such as mass reviewing, duplicate content, or time-based anomalies—using unsupervised anomaly detection techniques.

- *Crowdsourced Validation Layer*

A user feedback mechanism can be introduced, allowing other users to upvote or downvote the helpfulness of reviews. This feedback can be used to further train the system and enhance accuracy over time.

- *Real-Time Feedback & Notifications*

The system can be enhanced to provide real-time warnings to users while writing reviews if potential issues are detected, helping educate users and reduce accidental misuse.

- *Integration with Third-Party Review Platforms*

Beyond e-commerce, this system can be adapted and integrated with review aggregators like Google Reviews, Yelp, or TripAdvisor, making it more versatile and impactful across industries such as hospitality, education, and healthcare.

REFERENCES

[1]. Abhijeet A Rathore, “Fake Reviews Detection Using NLP Model and Neural Network Model” (IJERT 2023)
[2]. Cheolgi Kim, “Efficient Detection of Irrelevant User Reviews Using Machine Learning” (MDPI 2024)
[3]. Rami Mohawesh, “Fake Reviews Detection: A Survey”, (IEEE 2021)
[4]. Wesam Hameed Asaad, “Fake Review Detection Using Machine Learning” (IIETA 2023)
[5]. Miroslav Ölvecký, “Digital image forensics using EXIF data of digital evidence” (ICETA 2021)