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A Unified Framework for Detecting Fake Reviews and Counterfeit Products in E-Commerce Platforms using Machine Learning

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Abstract- ***The growth of shopping has changed how people buy things, but it has also brought new problems with trusting online sellers. Fake reviews and fake products are two issues for online marketplaces. Fake products hurt customers and good companies by making it hard to tell if a product is real, while fake reviews trick people who are thinking of buying something by changing the product ratings[6],[9]. Some studies have looked at these problems separately. Product companies have suggested using things like blockchain-based authentication, QR codes and image analysis to check if a product is real[13],[14]. For reviews, companies have used machine learning and natural language processing methods have been utilized to analyse reviews and find fake ones[1],[2],[10]. There is still a problem. No system checks whether a product is real. If reviews are trustworthy at the same time[13]. This makes it hard for online shopping platforms to really know if customers can trust what they are buying. This study suggests a way to look at both problems together. It wants to use computer analysis of reviews and checks on products to help online shopping platforms find and stop products and reviews. This can help people trust shopping more and make online marketplaces more open and honest. When we find and stop products and reviews, online shopping becomes safer for everyone. This is the thing for customers and businesses. Customers can trust the things that they buy online. Businesses also benefit from this because online shopping becomes reliable. This means that customers and businesses both can feel good about shopping online***

Keywords: Fake Review Detection, Detecting Counterfeit Products, E-Commerce Security, Using Machine Learning, Understanding Natural Language Processing, Evaluating Trust, Fraud Detection

I. INTRODUCTION

1.1 Background of Study

Online shopping habits of the customers have evolved. E-commerce sites like Amazon, Myntra and Flipkart make it easy to buy many products. Online shopping is easy, as you can purchase anything from any available platform. You can sit at home.

When people want to purchase something, they check what others have to say about it first. They read reviews to decide if they should really purchase it. For a company like Amazon, reviews are important. Reviews help people trust the product and buy from these stores[6],[8].

Online shopping is very common nowadays. People use Amazon, Myntra and Flipkart every time, but there's a problem: Some people write fake reviews to trick customers into buying something[1],[9]. They also sell products that look real. This damages the reputation of companies like Amazon, Myntra and Flipkart and their customers start losing trust. When people buy something, they find the product not up to the mark or to be a fake product, and they get upset. They lose trust in Amazon, Myntra and Flipkart. Because of these problems, online shopping isn't the same anymore. People who shop on Amazon, Myntra and Flipkart need to be careful when they buy things.
As these problems hurt customer sentiments and company reputation, So it is very important to address these problems and reduce them, most importantly, to eliminate them. The retail sectors, online stores, need to find ways to deal with fake reviews and fake products. This study focuses on making online shopping safer

1.2 Problem Statement

Fake review detection and counterfeit product identification are looked at as two separate problems, even though there has been significant improvements in fraud detection algorithms[10],[11]. Researchers

have used machine learning and natural language processing to find fake reviews by looking at the words used by the reviewers and how they behave[1],[2],[9]. They have also come up with ways to spot products using things like QR codes, blockchain-based authentication and checking images to make sure they are real[13],[14].

But, we do not have a system that checks if a product is real and if a review about a product is trustworthy/real at the same time[13]. This makes it hard for online shopping platforms to provide a way to know if they can trust a review and a product. Without a system like this consumers might still see reviews and fake products which can be bad for them when they are trying to decide a genuine product and it can also be bad for the market as it is not transparent. Fake review detection and counterfeit product identification are important because they can help people make choices when they are shopping online.

1.3 Motivation

Trust is an important factor when consumers buy things online. We use web services to purchase things online. When we purchase, we want to know that what we are buying is good, so we look at what other people have to say about the product to see if it's good or bad[8]. This is called a review. Sometimes people write fake reviews, and the consumers are sometimes misdirected through this[1],[9], which is not fair. Some products displayed online are also fake; they look like originals[13],[14] from a well-known brand, termed as a first copy of the original product or a counterfeit product. Here, fake reviews can make consumers interpret wrong assumptions about the product.

Researchers have tried to figure out ways to spot fake reviews using machine learning and natural language processing methods[2],[10]; a few researchers have found ways to detect counterfeit products using different tools[13],[14]. These are studied as two different things. Which is why the e-commerce platforms are still facing issues in making sure that people trust them

The need for systems that can check if reviews are real and if products are real at the same time is necessary, this will help in stopping people from cheating and make the e-commerce websites a safer place to buy things. It will also help people trust the platforms more. Trust is important for online e-commerce businesses to grow. This makes sure that people can trust the websites they use. Online shopping will have a positive impact on consumers if the products and reviews are real.

1.4 Objectives of Study

This study aims to look at the studies on finding fake products and detecting fake reviews on online shopping platforms, and by studying that, we find out what is missing in the current study and which aspect requires more work to be done.

Objective 1: Check and assess research methods for detecting fake reviews on online e-commerce platforms[1],[10].

Objective 2: Check currently used or in-use methods for finding counterfeit products [13],14].

Objective 3: To find research gaps in previous studies and a missing unified framework[15].

Objective 4: We intend on creating a system that combines both fake review detection and counterfeit product detection to build trust.

1.5 Contributions of the paper

This paper contributes to the field of e-commerce fraud detection and trust evaluation in several ways

We begin by verifying what other people have found out about reviews and fake products[1],[2],[10],[13] so that the research is not repeated. The information is presented in a way that makes sense, so it is clear what methods researchers have used to get their results.

Next, it looks at what is missing from the existing research. For example, as per current research, there are no systems that can check if a product is real and if the reviews are honest at the time[15].

Third, the paper suggests a way of doing things that combines machine learning with ways to check if a product is real. This means that websites might get

better at catching people who try to cheat, and it could make people trust the sites more.
Finally, the study talks about how this new way of doing things could make shopping more transparent and reliable, which would be good for e-commerce and, for people who shop online.

1.6 Organisation of the Paper
This shows how the rest of the paper is structured.
We will take a look at what people have found out about identifying counterfeit goods and detecting fraudulent reviews in Section 5. We will use what other people have done before to group the studies we have chosen.

In Section 6, we will talk about the methods and ideas we think are best for combining review credibility analysis with product authentication.

We will discuss what we think will happen and how we will assess the framework we suggest in Section 7.

We will highlight the uses and practical effects of the suggested system in real e-commerce settings in Section 8.

We will sum up what we found out in Section 9 and also talk about what people could look into next.

II. LITERATURE REVIEW

People are shopping more and more. This has made a lot of people worried about things happening when they shop online. For example, some people write reviews to make a product look good. Also, some people sell products that are not real. The problem of reviews and fake products is a big issue for online shopping. To solve these problems, researchers have put forth a number of computational strategies utilising deep learning, machine learning, and authentication technologies. By examining textual trends, reviewer behaviour, and metadata related to online reviews, a number of studies have concentrated on identifying misleading reviews [1], [2]. Other studies have investigated supply chain verification systems and authentication techniques for detecting fake goods [3], [4].

The chosen literature evaluated in this study looks at several methods for recognising counterfeit goods and detecting fake reviews in online marketplaces. Methodological approaches such as machine learning models, deep learning architectures, behavioural analysis techniques, hybrid detection systems, and authentication-based counterfeit detection methods are used to classify the examined papers.

i. Hyder et al. (2024) – BERT-Based Deceptive Review Detection in Social Media: Introducing DeceptiveBERT
The main objective of this study is to develop a transformer-based model to detect fake reviews on social media and e-commerce platforms by leveraging contextual language understanding. Methods utilised in this study were based on the BERT transformer architecture; the researchers suggested the DeceptiveBERT model. Ott, YelpNYC, and YelpZip were the datasets used to train the model. For review type classification, the transformer produced contextual embeddings. As a result, the model showcases improved accuracy in detecting fake reviews compared with traditional machine learning models. It effectively captured contextual relationships within review text.. Towards the end, the study concludes that a transformer-based contextual embeddings model enhances the ability to identify fake reviews and reduces the need for human feature engineering.

ii. Shalini & Chandrika (2025) – Fake Product Review Prediction using BERT-Enabled Multi-attention CNN
The main objective of this study was to increase the accuracy of detecting fake reviews by joining deep convolutional neural networks with contextual language representations. A hybrid design was suggested that combines a multiattention convolutional neural network with BERT embeddings, along with behavioural patterns learned from user activity. The model examined the review text. As a result, by capturing the contextual and behavioural data, the hybrid model performed better than other machine learning models. Towards the end, the study concludes that the model performs better because BERT and multi-attention CNN layers work together.

iii. Amin et al. (2025) – Boosting Arabic Fake Reviews Detection by Integrating Textual and Metadata Features
The main objective of this study was to look at the words used by people in the reviews and also who wrote the reviews. It focuses on reviews written in the Arabic language. An Arabic BERT model was introduced/suggested, which uses information on how many reviews a product got and how they are rated. It is a transformer-based model. As a result, the model shows that when the words and the information about them are combined, the model has high accuracy in figuring out the review. Towards the end, the study concludes that integrating textual and behavioural metadata significantly enhances fake review detection in multilingual environments.

iv. Sharma et al. (2025) – Revealing the Reliability of Amazon Products via Innovative Fake Review Detection using Machine Learning
The main objective of this study was to check how dependable Amazon product reviews are using machine learning Method of this study involved finding reviews in Amazon data. Researchers used several machine learning methods like SVM(Support Vector Machine), Random Forest and BERT-based models. As a result, the BERT-based model showcased better accuracy than any other machine learning model. Towards the end, the study concludes that combining deep learning and machine learning models can help figure out if a product is reliable or not.

v. Kumaragurubaran et al. (2025) – Psychological-Based Opinion Mining for Fake Review Detection
The main objective of the study was to detect fake reviews by analysing psychological and emotional characteristics present in review text. Methods utilised by the researchers used natural language processing techniques combined with machine learning algorithms to analyse emotional consistency, linguistic patterns, and psychological indicators in reviews. As a result, by looking at how people write and by analysing the emotions of the reviewer, the model helped to spot the fake reviews. Towards the end, this study concludes that when psychological analyses are combined with machine learning models, they can improve the accuracy of ML models and help them in finding fake reviews

vi. Abedin et al. (2024) – Predicting Credibility of Online Reviews: An Integrated Approach
The main objective of this study was to check the reliability of reviews using machine learning and artificial techniques. Researchers built a machine learning model using a multi–layer perceptron network and using SHAP techniques to get the insights. As a result, the model is trained to find fake reviews by looking at factors like how the review is, how subjective it is and if the ratings are consistent. Towards the end, the study concludes that machine learning techniques that are easy to understand can make review analysis more transparent for the users

vii. Singhal & Kashef (2024) – A Weighted Stacking Ensemble Model With Sampling for Fake Reviews Detection
The main objective of the study is to make a review detection by dealing with many real reviews and a few fake reviews in the dataset. The researchers suggested a weighted stacking ensemble model that uses multiple machine learning algorithms with sampling strategies like SMOTE and ADASYN. As a result, the weighted stacking ensemble model had F-1 scores and better detection accuracy than any other classifiers. Towards the end, the study concludes that combining classification models with ensemble learning models can help in identifying fake reviews.

viii. Zhang et al. (2023) – Building Fake Review Detection Model Based on Sentiment Intensity and PU Learning
The main objective of this study was to develop a fake review detection system that could handle datasets with partial labels. Researchers suggested a SIPUL framework to figure out how people feel about a product. It learns this by using a Positive Unlabelled learning method. As a result, using sentiment-based feature separation, the suggested system successfully categorises fake reviews and enhances detection performance in unbalanced datasets. Towards the end The study showcased that Positive-Unlabelled learning is useful for detecting fake reviews when labelled data is limited

ix. Jagadeeshwar et al. (2025) – Counterfeit Product Detection Using Algorand Blockchain
The main objective of this study was to develop a blockchain-based model to detect counterfeit

products. The researchers suggested system that used Algorand blockchain technology combined with QR code authentication to verify product authenticity. Smart contracts were used to store and validate product information. As a result, Reliable product authentication was made easy by systems' quick transaction verification and tamper-proof product data. Towards the end the study concludes that blockchain technology can prevent counterfeit products by providing transparency

x. Qazi et al. (2024) – Machine Learning-Based Opinion Spam Detection: A Systematic Literature Review

The main objective of this study was to evaluate current deep learning and machine learning techniques in opinion detection. Researchers utilised the PRISMA technique and performed a systematic evaluation of the literature and research papers using various datasets. As a result, the study identified datasets that are commonly used such as Amazon and yelp and showcased that SVM and deep learning models are widely used for spam detection. Towards the end the study concluded that for a fake review detection system in future, it should combine behavioural context and deep learning strategies and cross-domain detection methodologies

2.2 Comparative Analysis of Existing Methods

People have looked into ways to figure out if something is fake and to find fake reviews on the internet. These ways are different because they work better or worse, they use information, and they do things in different ways. Some ways use computer programs that can understand what people are saying in their reviews. Other ways just look at what people're saying and what they are doing. To catch people who are being dishonest, some computer programs look at what people're doing and how they are feeling. To make sure they catch everything, some systems use different ways of doing things. Some people have also thought of using codes and computer systems to make sure things are real.

A comparison of the studies that were chosen is shown in the table, and it looks at the way they did things, the information they used and what they were trying to do.

2.3 Critical Review

Significant progress has been made in finding activities on e-commerce sites, especially in spotting bogus reviews. Many studies have used machine learning, deep learning and transformer-based models to detect reviews[1],[2],[6],[10].

Machine learning approaches like Random Forest models and Support Vector Machines have been widely used because they are easy to use and can categorise review content based on behavioural characteristics[5],[6].

However, these methods may struggle to work across different datasets and platforms.

Recent developments in learning have improved the effectiveness of fake review detection systems.

Models like BERT have shown the ability to understand contextual relationships within review text[1],[2],[4].

These models are good at identifying patterns that other methods might not see.

Deep learning models need big labelled datasets and substantial processing resources[2],[6].

The use of psychological traits to spot misleading reviews is another area of study[7].

These methods look for suspect review behaviour by examining clues, sentiment intensity and reviewer activity patterns[7],[8].

Although these methods offer information on reviewer authenticity, they often rely on user activity data.

Hybrid and ensemble-based detection methods have also been suggested to increase classification accuracy[10].

These models combine predictions from classifiers to get more dependable results.

However, they still mostly concentrate on identifying reviews and frequently overlook other types of fraud[13].

Several studies have suggested techniques to detect counterfeit goods[13],[14].

Retailers and customers can confirm the legitimacy of products using authentication methods like blockchain-based supply chain tracking and QR code verification systems[14].

These methods usually function separately from review analysis systems.

The literature shows that research efforts have mostly concentrated on identifying products or detecting fake reviews, as distinct issues[15].

Few studies make an effort to address both problems at the same time[13].

This division hampers e-commerce platforms' capacity to thoroughly assess product credibility and marketplace trust.

Therefore, integrated solutions that can assess review authenticity and confirm product validity within a framework are required.

2.4 Identified Research Gaps

Researchers have made a lot of effort to figure out if reviews are fake using machine learning and other ways to analyse things[1],[2],[10]. On websites where people buy things, advanced tools like BERT are really good at finding reviews that are not honest[1],[2],[6].

When customers purchase products online, they need to be sure that the products are real. Some studies have focused on ways to verify if products are authentic[13],[14]. These ways often use things like codes on products, QR codes or systems that use pictures to check if a product is real[14]. This helps make sure that customers get products when they buy things online.

Most of the time, researchers look at two problems. Finding fake products and finding fake reviews. As separate issues[15]. So most systems usually check either if a product is real or if a review is honest, but not both at the same time[13]. This creates a problem because no system checks both the product and the review to make sure they are both real.

Another problem with systems is that they only look at one type of information. For example, some systems only look at what people write in reviews[5],[6], while others only look at how users behave[7],[9]. People who try to trick others use many different ways to do this. So, looking at one type of aspect, about these people who try to trick others, might not be enough to figure out. To solve these problems, we need a system that can check both products and reviews at the same time[13]. This system would help websites where people buy things to be more trustworthy and honest. It would also make it harder for bad sellers to sell products by writing fake reviews.

This study aims to create a system that combines machine learning to analyse reviews with ways to verify products[1],[10],[13],[14]. By combining these two things, the new system hopes to provide a better way to find fake products and fake reviews on websites where people buy things, which would make buying things online safer and more trustworthy. The new system will help marketplaces like these to maintain trust and transparency and it will also help to reduce the chances of fraudulent sellers promoting counterfeit products through misleading reviews, and ultimately the new system will help to make e-commerce a safer place for everyone

III. PROPOSED METHODOLOGY

This part talks about how to find activity on e-commerce sites. It does this by checking for reviews and making sure products are real at the same time. The goal is to make online shopping more trustworthy and open.

To find reviews that do not seem right and to make sure products on these sites are real, the suggested way uses computer models, ways to understand language and ways to check if products are genuine[1],[2],[13],[14].The system checks e-commerce platforms to find reviews and to make sure products are real, which helps to increase trust in online shopping and make e-commerce platforms more trustworthy.

3.1 System Overview

The idea is to use a method that does things in steps to find activity in online markets. This system looks at information about products. What people say about them on e-commerce websites, and it checks this information to see what is important. Then it uses machine learning that can learn to find reviews that're not true[1],[6],[10]. At the time, the system uses ways to check if a product is real, like using a special kind of computer record called blockchain to track products or checking a special code called a QR code[13],[14].

We can trust that a product is real and that what people say about it is true when we combine what we find out from looking at reviews and from checking if the product is real. The product and its reviews are checked to make sure they are real by using these two methods, which are the review analysis and the product authentication methods, to get a complete picture of the product.

3.2 Framework Architecture

This section contains the major parts required for the suggested framework

3.2.1 Data Collection

This part of the system gets information from e-commerce platforms, such as:

- Details about the product
- Reviews from people who bought the product
- Information about the people who wrote the reviews
- Data to check if the product is real

The information that the system collects is used to research the product.

3.2.2 Data Preprocessing

The preparation phase does a lot of work to get the data we have collected ready for analysis. This includes some tasks like:

- Eliminating redundant reviews
- Removing stop words
- Breaking down the review text into parts
- Making sure the text data is consistent

The preparation phase procedures really help make the data we put into machine learning models better[1],[6].

3.2.3 Feature Extraction

We look at the data we have collected and find insights. The insights we find can be, like the language people use when they write a review[1],[2]. They can also be how people feel about something, which we call sentiment ratings[11].

We look at what people do when they write reviews, like how they write them, which is called patterns of reviewer activity[7],[9].

These things help us see what is going on with reviews that are not honest.

The characteristics of the review text, sentiment ratings, patterns of reviewer activity and behavioural markers are all things that help us spot trends linked to misleading reviews[7],[8],[9].

3.2.4 Fake Review Detection

We use machine learning and deep learning models to look at the review data we have processed [1],[2],[6],[10].

These include things like

- BERT-based review categorisation[1],[2]

- Models of learning[5],[6],[10]
- Models of behavioural analysis[7],[9]

Machine learning models and deep learning models use the information we have extracted to decide if a review is authentic or if it is a review.[1],[2],[10]

3.2.5 Counterfeit Product Authentication
This module uses some tech methods to check if a product is real or not[13],[14].
Here is how it works:

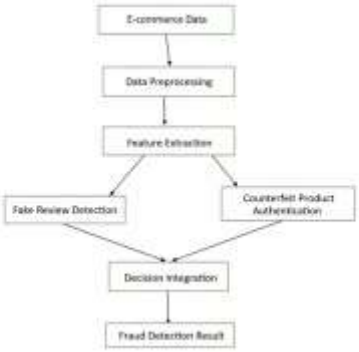
- It checks the QR code on the product[14].
- It keeps an eye on the supply chain using blockchain technology[14].
- It also looks at pictures of the product[13].

3.2.6 Decision Integration
The product listing gets a trust score. This score is figured out by putting together information from two parts[13]. The system looks at a things.

It checks to see if the product listing is believable.
It checks if the product is real.

The system uses these things to decide if a product listing is good or maybe not true.

3.3 Workflow Diagram



IV. EXPECTED RESULTS AND DISCUSSION

This part is about how we will check if the system works compared to what we do now, and what we think will happen if we use the new system. We want to see if people will trust shopping more and if we can get better at finding fake products. The system is special because it can find reviews and check if products are real at the same time, so we will look at how well it does these two things, especially for online shopping platforms and finding fraud.

4.1 Expected Outcomes
When we look at reviews and products at the time the new way of doing things should help us find fake stuff in online stores.

i. Performance Improvements
We think we can find reviews better with new computer programs that understand language. These programs can look at how people behave and what they say to find reviews. This is better than ways that just look at what people write.

ii. Robustness
The new system is made to deal with kinds of fake things online. It can find products and reviews by looking at both at the same time. This makes the system better, at finding stuff.

iii. Scalability
We think the new system will work well for online stores with millions of products and reviews. We can use sets of data to help find fake stuff in real time with computer programs and special techniques to check if things are real or not. The new system should be able to handle a lot of data and help online stores be safer for people to buy things.

4.2 Comparative Evaluation Plan
The system will be compared to fake review detection techniques to see how well it works. We will look at how accurate it is, how precise it is and how well it can recall fake reviews. We will also look at the F1-score of the system.

We will test the system using reviews from Amazon and Yelp to see what it can do. We will compare the results to models like the ones that use machine learning and transformer-based models.

The system has a part that checks if a product is real or not. We will see if this part can confirm if a product is authentic by using methods, such as blockchain or QR codes. The counterfeit product detection part of the system is very important. We

will make sure it works well with the fake review detection part of the system. The system and the counterfeit product detection component will be evaluated together to see how well they work.

4.3 Discussion

The new framework is better than what we have. Most research uses deep learning or machine learning to find fake reviews. These methods often miss fake products being sold online.

The new method is more complete because it checks for reviews and makes sure products are real. This means that people can trust what they buy online more. E-commerce platforms can now look at both reviews and products to make sure they are okay.

This is good for stores, shops and customers. Businesses can protect their name by stopping products from being sold. Customers decide if they want to purchase because they will know if the product is real or not.

The main goal of the framework is to make online stores safer and more trustworthy.

V. APPLICATIONS AND USE CASES

The approach to spot reviews and counterfeit products is really helpful in real online shopping situations. It can make online marketplaces safer and more trustworthy by using computer programs to check reviews and verify products. This solution helps to make things clear and transparent. The machine learning review analysis and product authentication methods are key to achieving this. By using these methods, online marketplaces can increase security, trust and transparency. The approach can enhance security, trust and transparency in marketplaces.

5.1 Industry Use

The suggested framework is really useful for e-commerce businesses like retail platforms. It helps them figure out which products are fake and which reviews are not real. It does this by looking at reviews that seem suspicious and checking if products are genuine using things like QR codes or special tracking systems that use blockchain. This helps the people in charge of marketplaces keep an eye on whether products are trustworthy or not. Using the suggested framework can make people trust product listings more. There will be fewer merchants who try to cheat.

5.2 Social Impact

People do not like to buy things that're not real. Fake things and fake reviews can make people not want to buy things. They might even lose money if they buy something that's not what they thought it was. The new plan helps people make choices when they buy things online. It makes sure that the things people review are really what they say they are. It makes sure that the things people buy online are the real. This makes the internet a safer place in which to shop. It helps stop people from selling things on the internet. The internet marketplace is a place where people can trust what they are buying.

5.3 Policy Relevance

Technologies that help us find goods and false reviews can be really helpful to people who make rules and groups that look out for consumers. The system that is being suggested can help make laws better so that people who buy things online are protected, and the things they buy are real. This system can assist in making sure that laws about products and honest online markets are followed by using computers to automatically find cheating and fraud. The system can help with this by using computers to find goods and false reviews.

5.4 Academic Value

The thing about this way of doing things is that it helps us learn more about cybersecurity, machine learning, and natural language processing. We can now look at fraud detection in marketplaces in a new light. This is because we can use review detection and counterfeit product authentication together. This method can be used in the future to look at advanced ways to check if things are real and to use bigger sets of data and better models to make e-commerce systems more trustworthy. We can use this method to make e-commerce systems by using cybersecurity and machine learning and natural language processing research.

VI. CONCLUSION

This study looked at fifteen research works to understand the problems of fake reviews and counterfeit goods on e-commerce platforms. It found ways to identify fake reviews, such as using ensemble learning techniques, transformer-based architectures, deep learning models and behavioural analysis techniques. Some research also looked at ways to identify goods, such as using blockchain and QR-based identification systems.

The study found that even though there has been progress in these areas, there is still a gap in research. Most current research looks at reviews and counterfeit goods as separate issues. While authentication technologies detect counterfeit goods, language usage and reviewer behaviour are used to detect fake reviews, which makes it difficult for e-commerce sites to show the originality of a product
This study suggested a way of doing things that combines checking counterfeit goods with identifying fake reviews. The new method uses product verification technology and machine learning to analyse reviews and identify activity. It has parts, including data preparation, feature extraction, classifying fake reviews, verifying counterfeit goods and making a final decision. By putting all these parts the system tries to give a complete trust assessment for products listed online.

The main thing this study adds is a method that checks both product legitimacy and review authenticity at the same time. It connects two areas of fraud detection in e-commerce systems and shows how natural language processing and authentication technologies can be used together to make online marketplaces more reliable and transparent.

In short the new framework can make e-commerce systems more secure, open and trustworthy. It can help businesses make sure products are genuine and help customers make purchasing decisions by identifying counterfeit goods and fake reviews in one system. Future research will focus on using the framework testing it with real data and looking at new machine learning approaches to improve fraud detection, in online marketplaces.

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