INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 06, June 2024, pp: 2234-2238

Impact Factor: 5.725

DETECTION OF FRAUDULENT SELLERS IN ONLINE MARKETPLACE

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DOI: https://www.doi.org/10.58257/IJPREMS35242

ABSTRACT

The article examines the advancements made in using online machine-learned models to detect auction frauds on e-commerce websites. As online shopping and auctions gain popularity, criminals are taking advantage of these platforms for fraudulent activities. To address this issue, proactive fraud-detection systems are commonly employed, with machine-learned models proving more effective than rule-based systems. The study presents a framework for an online profit model that incorporates online feature selection, coefficient bounds, and multiple instances learning. By conducting empirical experiments using real-world auction fraud data, the model demonstrates its potential in identifying a greater number of frauds and reducing customer complaints compared to baseline models and rule-based systems.

Keywords: Machine-learned models, onlinetrading, fraud-detection, human-tuned rule-based systems, coefficientbounds

1. INTRODUCTION

The expansion of the internet has created a demand for innovative approaches to creating online information services. As web structures become more intricate, users often struggle to navigate and may encounter unreliable websites and products. The e-commerce industry is evolving rapidly, emphasizing the importance of web platforms that can anticipate customer needs and establish trust in products. While online trading offers benefits, it also increases the risk of fraud, leading to financial losses for honest individuals. Therefore, there is a critical need for systems that can predict user preferences and assess product credibility to enhance website usability and retain users. Personalization and the integration of fraud detection systems are effective strategies to tackle these issues.

2. METHODOLOGY

2.1 Customer Module

The primary objective of this platform is to provide customers with a personalized and secure shopping experience. By registering and accepting the terms of service, customers can establish their own accounts and browse through a variety of products from various sellers. Each product listing contains essential details such as the product name, price, seller name, and other pertinent information. To assist customers in making informed choices, there is a reliability rating for each product based on feedback from other users. In the event of any issues post-purchase, customers can file complaints related to problems such as non-delivery, product inconsistencies, misleading descriptions, or offer general feedback.

2.2 Seller Module

The objective of this platform is to effectively handle product listings and ensure that product information remains current. Sellers must complete a registration process and await approval from the administrator. Once approved, sellers have the ability to make changes to their products, such as adding, removing, or editing details like prices and descriptions. Additionally, they can introduce new offers on products to ensure that customers have access to the most recent information and promotions.

2.3 Administrative Module

The main goal of this platform is to manage operations, ensure reliability, and improve communication between sellers and customers. The administrator evaluates customer complaints and decides whether to ban products depending on the severity of the issues. They also supervise sellers, removing any considered untrustworthy along with their products. Furthermore, the administrator guarantees the website operates smoothly, updates information frequently, and promotes a safe environment for all users.

2.4 Complaint Filing

The primary goal of this platform is to offer customers a way to report fraudulent activities and find solutions. Customers have the option to submit complaints about different issues such as non-delivery, product discrepancies, misleading

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descriptions, or provide general feedback. The administrator carefully examines these complaints, assessing their nature and frequency. If the number of complaints regarding a specific product surpasses a certain limit, the product is marked as untrustworthy or prohibited, rendering it invisible to users. This procedure guarantees swift action against fraudulent activities and upholds the platform's trustworthiness.

2.5 Fraud Churn

The primary objective of this platform is to establish a trustworthy environment for all users by identifying and eliminating dishonest sellers and products. The administrator has the authority to determine whether sellers can continue selling their products, and any products flagged as fraudulent by experts will result in the immediate removal of the seller and their items. To uphold trust, fraudulent sellers and products are promptly removed from the platform. User, product, and transaction data are securely stored using MySQL. User interfaces that are interactive and user-friendly for customers, sellers, and administrators are created using JSP technologies. The process involves customers registering, browsing products, checking trustworthiness indicators, making purchases, and lodging complaints if necessary. Sellers register, manage their product listings, and update product information. Administrators oversee customer and seller activities, address complaints, and maintain the platform's integrity by eliminating untrustworthy sellers and products.

3. MODELING AND ANALYSIS

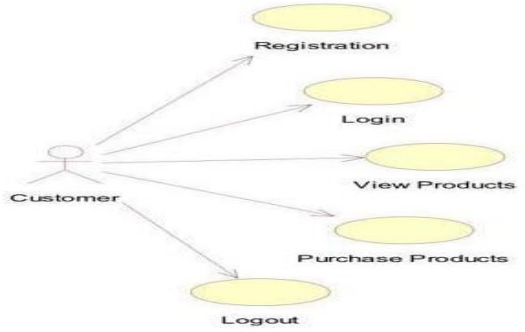

Figure 1: Use case diagram for customer purchase

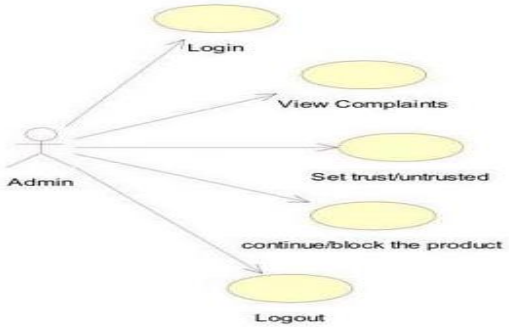

Figure 2: Use case diagram for admin

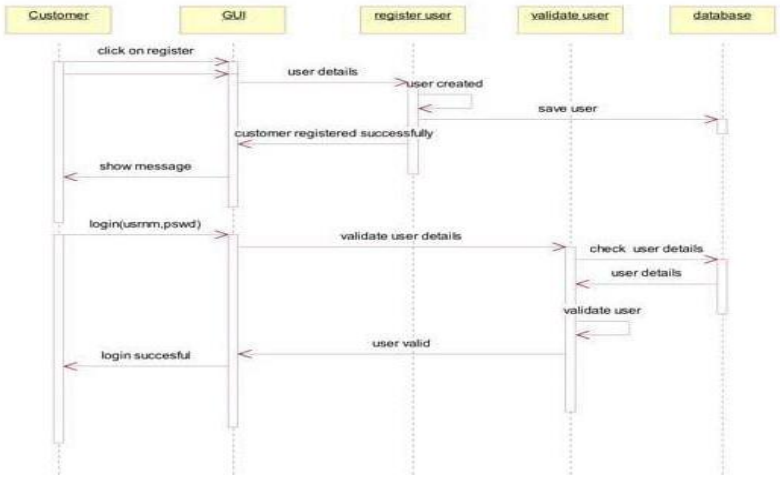

Figure 3: Sequence diagram for customer login

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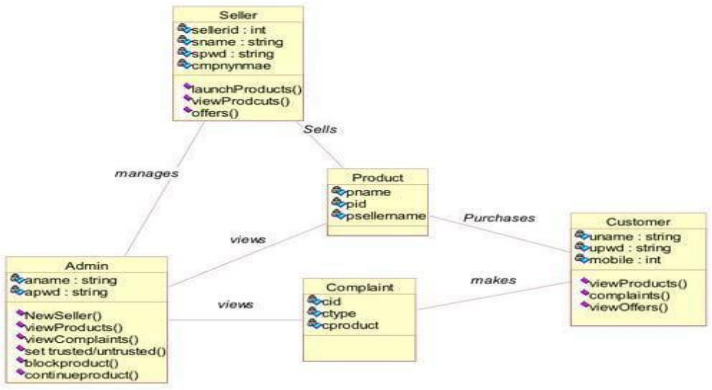

Figure 4: Class diagram for application

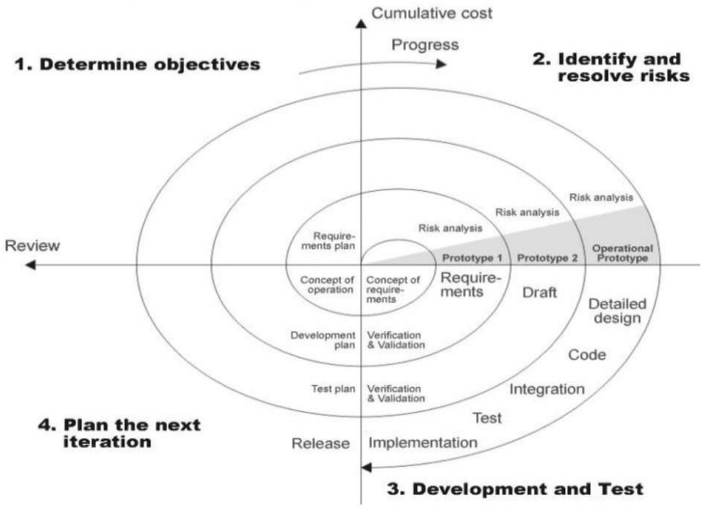

Figure 5: Spiral Model

4. RESULTS AND DISCUSSION

The World Wide Web (WWW) has led to the popularity of electronic commerce, or e-commerce. Websites have made shopping convenient and profitable for all. While traditional online shopping allows sellers to set prices and buyers to make purchases, our innovative online model focuses on detecting fraudulent products and prioritizing customer satisfaction. In our system, the website, managed by the admin, sells only trustworthy products. Customers can assess product reliability and report any issues, helping to identify sellers of fraudulent products. True online shopping goes further by understanding each customer's unique interests and needs, allowing for personalized content and offers that build brand loyalty over time.

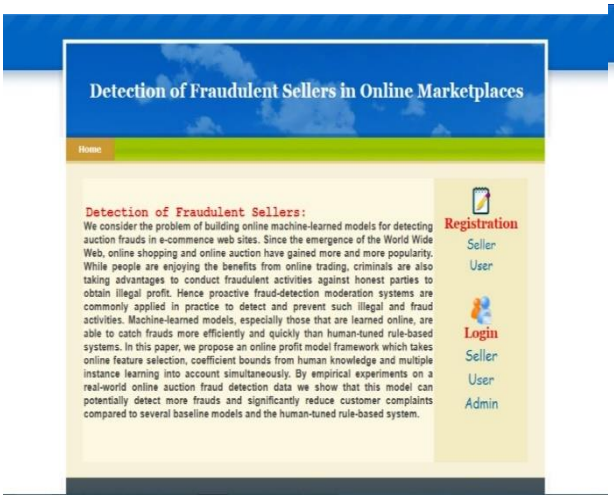

Figure 6: Front Page

Figure 7: Admin login page

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Figure 8: Seller's login page

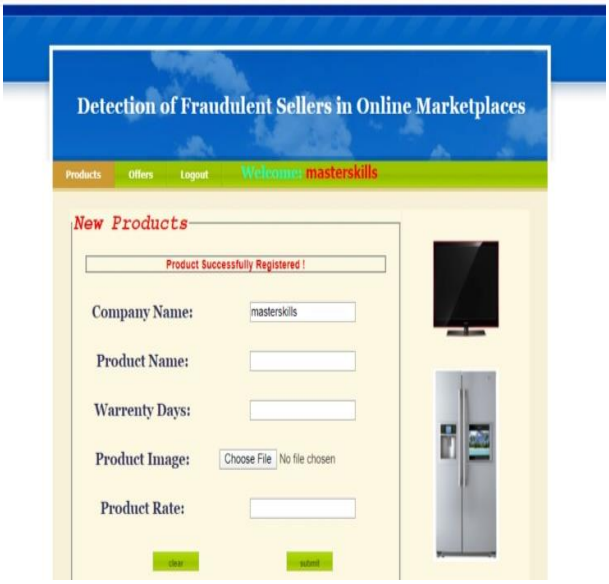

Figure 9: Seller's product regestration page

Figure 10: Product review page

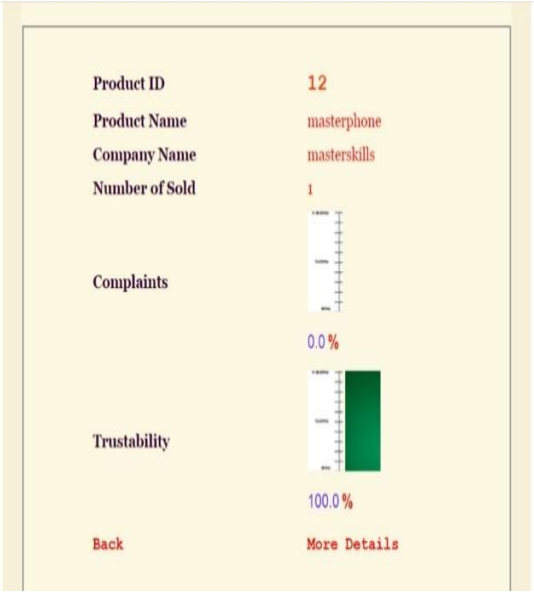

Figure 11: Product genuity page

Figure 12: Complaint submission page

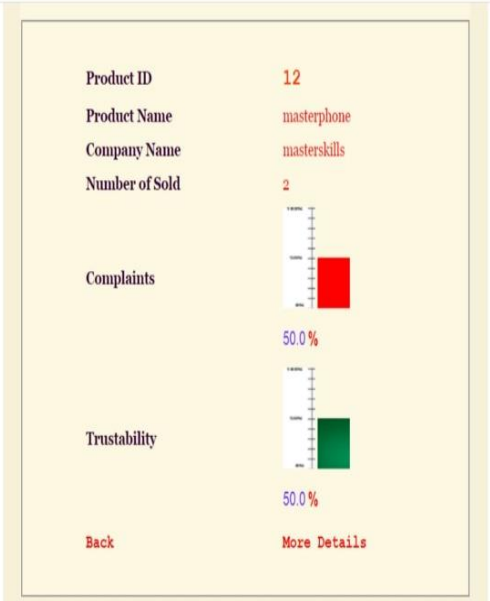

Figure 13: Genuity output page

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Figure 14: Fradulent product banded output page

In future research, it is crucial to incorporate the adjustment of selection bias into the online model training process. This successful method used for offline models involves assuming that all unlabeled samples have a response of 0 with minimal weight, sourced from a reliable moderation system. This approach can be applied to various applications like web spam detection and content optimization, essential for websites aiming to provide personalized and trustworthy experiences to users worldwide. The issue of web spam has been a concern for consumers and web service providers since the early days of the World Wide Web. One potential solution is to develop a system that can detect spam and categorize websites as spam or non-spam by analyzing patterns in website links and content. By utilizing features based on the link graph or host page content, a more comprehensive model can be created for a broader coverage of websites. The term "spamicity" is introduced to indicate the likelihood of a page being classified as spam.

5. CONCLUSION

Since the internet was first introduced, e-commerce has seen a rapid increase, offering many advantages in terms of convenience and cost savings. Typically, online shopping involves sellers listing products at set prices, allowing buyers to make purchases if they meet their needs.

Our innovative approach focuses on detecting fraudulent products while also meeting consumer needs. In this system, the website, managed by an administrator, ensures the reliability of products. Consumers can assess the credibility of items before buying and report any issues to warn others. While this system may not completely eliminate fraud, it greatly improves the ability to identify dishonest sellers.

Successful online shopping should cater to the unique preferences and demands of each user, creating a dynamic platform that enhances content and offerings. This level of personalization is essential for building long-term brand loyalty and engaging customers.

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