

AI-Generated Product Authentication System

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Abstract –

The growth of e-commerce platforms has significantly changed how people purchase products. Today, customers usually check product ratings and reviews before buying any item online. These ratings help them understand the quality and reliability of a product.

However, many online shopping platforms still rely on simple rating systems that mainly consider star ratings and customer reviews. Because of this limitation, some products may continue to show high ratings even when many customers return them due to quality issues or delivery problems. This can mislead new customers and reduce their trust in the platform.

To overcome this issue, this research proposes a dynamic product rating system for an e-commerce platform. Unlike traditional rating systems, the proposed system calculates product ratings by combining several factors such as customer reviews, delivery feedback, and product return information. If a product is returned frequently, the system automatically reduces its rating so that the displayed rating better reflects the actual product performance.

The system is developed using the MERN stack and also includes an AI chatbot that assists administrators in searching, monitoring, and managing products more efficiently. The main objective of this system is to improve transparency in product ratings and help customers make better purchasing decisions.

Key Words: E-commerce, Product Rating System, Dynamic Rating, product Return Analysis, MERN stack, Chatbot

1.INTRODUCTION

In recent years, online shopping has become very common, and many customers prefer to buy products through e-commerce websites. Before purchasing any item, customers usually check the ratings and reviews provided by other users. These ratings help them evaluate the quality and reliability of the product.

However, many e-commerce platforms still use basic rating systems that depend mainly on star ratings and written reviews. In some cases, a product may still show a high rating even when several customers experience problems related to product quality or delivery services. As a result, customers may trust the rating and purchase the product but later receive an unsatisfactory item. This can negatively affect customer confidence in the platform.

To solve this issue, this research proposes a dynamic product rating system for an e-commerce platform. The system calculates product ratings by considering not only customer

reviews but also delivery feedback and product return data. If a product is returned frequently, the system automatically decreases its rating.

The platform is built using the MERN stack, and an AI chatbot is integrated to help administrators manage and search products more effectively. The primary aim of this system is to make the product rating process more transparent and reliable.

2. Body of Paper

2.1 Problem Statement:

Online shopping platforms are widely used for purchasing different types of products. In such platforms, product ratings play an important role in helping customers decide whether a product is trustworthy or not.

However, many e-commerce platforms still use simple rating methods that mainly depend on customer reviews and star ratings. In many situations, a product may still maintain a high rating even when customers face issues such as poor product quality or delivery delays.

Customers may return the product due to these problems, but the return information is often not reflected in the product's rating. Because of this, new customers may rely on the rating and purchase products that do not meet their expectations.

Therefore, there is a need for a more reliable rating system that includes additional factors such as delivery experience and product return data.

2.2 Proposed System:

To solve this problem, this research introduces a dynamic product rating system for an e-commerce platform. In the proposed system, product ratings are calculated using multiple factors instead of relying only on customer reviews.

The system calculates the product rating by considering customer ratings, delivery feedback, and the number of returned products. If a product is frequently returned by customers, the rating of that product automatically decreases. This approach helps provide a more accurate representation of product quality.

The system also integrates an AI chatbot that assists administrators in searching and managing products efficiently.

2.3 System Architecture:

The system is developed using modern web technologies such as React.js, Node.js, and Express.js. The system consists of three main user roles: customer, seller, and administrator.

Customers can browse products, place orders, provide ratings, and request returns. Sellers can add and manage their products

on the platform. The administrator monitors the entire system and manages product information.

An AI chatbot is also integrated into the admin panel to help administrators search and manage product data more efficiently.

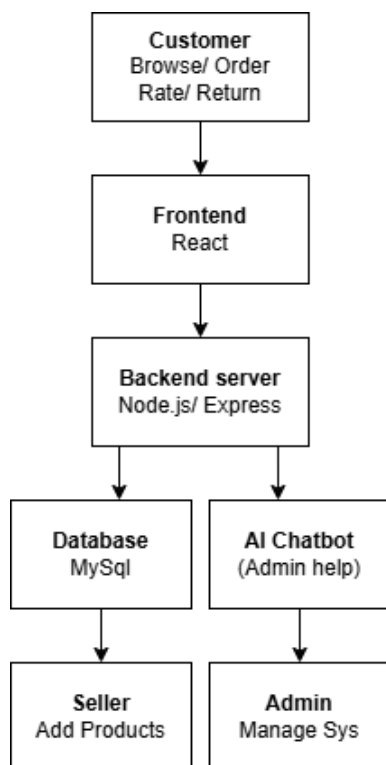


Fig-1: System Architecture of Dynamic Product Rating System

The Dynamic Product Rating System connects customers, sellers, admins, and AI components to ensure product authenticity and trustworthy ratings. Customers browse, order, rate, and return products, while the React frontend communicates with the Node.js backend, which manages orders, ratings, and returns. The MySQL database stores all product and customer data, supporting AI analysis. The AI chatbot assists admins, sellers, and customers, while admins monitor the system and assign badges based on product quality. Overall, the system enables dynamic rating updates, AI-driven authenticity checks, and improved customer trust.

2.4 Implementation

The system is developed as a web application where users can browse products, place orders, and give ratings. React.js is used to design the user interface, while Node.js and Express.js handle backend operations. MySQL is used as the database to store product information, user details, orders, and ratings. The system collects delivery feedback and product return data from customers. Using this information, the system automatically updates the product rating.

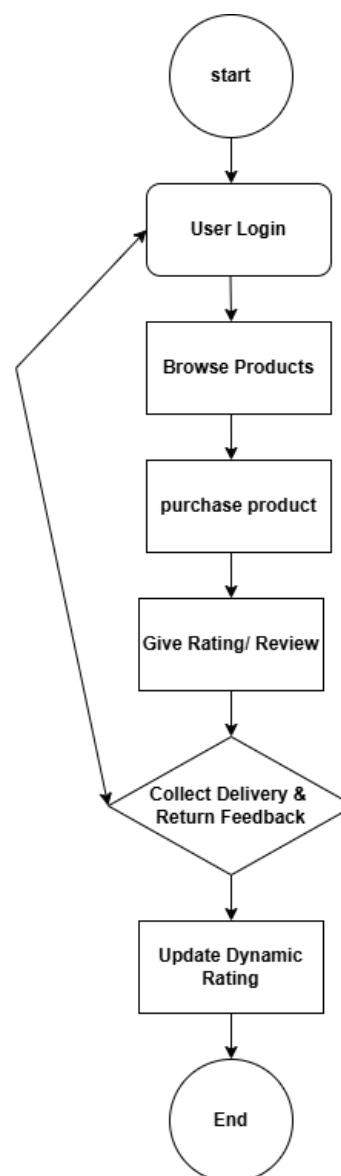


Fig -2: Implementation Flow of the Proposed System

2.5 Results and Discussion:

The proposed system provides more reliable product ratings compared to the traditional rating method. By considering delivery rating and return rating, the system can better represent the real quality of product.

Product	Delivery Rating	Return Rating	Badge	Dynamic Rating
Product A	2	2	Low	2.5
Product B	4	5	High	4.0

Product C	5	5	High	4.7
Product D	3	3	Medium	3.5

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The table presents the product ratings in numeric form for both delivery and return experiences. The system calculates the overall dynamic rating based on these two values and assigns a badge (High, Medium, or Low) to indicate the product's overall quality. This combined approach allows users to see both the numeric rating and an easy-to-understand badge.

3. CONCLUSIONS

This research presents a dynamic product rating system designed for e-commerce platforms.

Unlike traditional rating systems that depend only on star ratings and reviews, the proposed system also considers delivery feedback and product return history when calculating product ratings.

By combining these factors and displaying both numerical ratings and quality badges (High, Medium, Low), the system helps customers quickly understand the actual quality of products. This improves transparency in the rating system and helps customers make better purchasing decisions.

Overall, the proposed system enhances trust in e-commerce platforms by providing more accurate and reliable product ratings.

4. ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my guide Mr. H. K. Patil for his valuable guidance, support, and encouragement throughout the development of this project. His suggestions and continuous motivation played an important role in completing this research successfully.

I also thank the Department of Computer Technology, AITRC Vita, for providing the necessary resources and support for this work. Finally, I would like to thank my family and friends for their encouragement and support during the completion of this research paper.

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