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CUSTOMER-TARGETED E-COMMERCE WEBSITEUSING WEB SCRAPING

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Abstract: Online shopping is the most common trend for obtaining products delivered to people's doorsteps. Consumers consistently strive to find the best products within their price range. Users browse numerous websites, which takes a high time, to look up product prices and offers. Products on e-commerce websites frequently alter in price. It becomes challenging for users to keep track of costs and choose the best online offer. So, we proposed a Customer Targeted E-Commerce application that uses a web scraping technique. It is a user-friendly e-commerce application designed in such a way that the application gathers all the required information, like names, features, prices, reviews, and ratings of particular products, from all the websites. Sentiment analysis done on reviews. A string-matching algorithm is applied to find the similarity in the features of those products, and among these similarly featured products, the best is figured out based on reviews, ratings, and price. The application includes a rule-based chatbot to interact with and help users with price analysis negotiation, commonly called "Price Negotiation." Customers can also provide feedback on our application either in the form of reviews or ratings. Our application prioritizes both customer and seller happiness.

Keywords: Web scraping, Rule-based chatbot, Review analysis, Electronic commerce, Selenium.

1 INTRODUCTION

The development of some of the most implausible technology ever imagined is a direct result of the internet, which is human's biggest revolution. The internet has revolutionized corporate processes by removing barriers in areas of social media, entertainment, and possibly e-commerce. Electronic commerce is called e-commerce. It refers to electronic media and the internet for trading goods and services. Electronic commerce includes business access to the internet and information technology, including electronic data interchange. E-commerce refers to websites of Internet Service Providers that sell goods and services directly from their platforms to users. To payments using a credit card, debit card, or wire transfer, the gateway utilizes a wireless shopping cart or basket. E-commerce stores are becoming more and more well-liked as a result of how the internet has updated and altered our way of existence.

1.1 Objective

When you decide to take your business online, you must be ready to face competition on a global level. So, one way we can improve our e-commerce activities and stay ahead of the competition is by gathering as much content as possible from the same online space. There are many online e-commerce websites in the present world, but users always try to get the best product for the best deal. In this process, users search for the product on all websites and select the best one, which leads to a highly time-consuming process, and users may not be satisfied with prices. The proposed application's primary goal is to offer a practical response to the problem statement. The application uses the web scraping technique that collects the user-required products from all the websites and displays the best product details on the website based on a string-matching algorithm and sentiment analysis. Hypertext Transfer Protocol or web browser are the two ways a web scraping software can access the internet. To retrieve specific data from web pages, web crawlers, and web scrapers collaborate. Users can bargain the product's price in our application.

1.2 Benefits Of Customer-Targeted E-Commerce Website Using WebScraping

Both customers and sellers benefited from this website. Customers will

get the best products for the best prices. Sellers will have a track of the details of any product in the market and fix the price of the product to have a profit. If customers are satisfied, sales also increase, which increases the benefits for the seller too. Like in the real world, customers can negotiate the price with the help of a chatbot.

2 RELATED WORK

For several years, major work has been done in electronic commerce to make it more user-friendly, typically involving many new technologies. The purpose of conducting a literature review is to examine the context of the current project. The following themes are part of our research work which helped us in the improvement of a project.

2.1 Social network web scraping

In work, data extraction isn't a straightforward process, claim Renita Crystal Pereira and Vanitha T [1]. They featured tools and approaches as well as an introduction to web scraping. Data collection using web scraping [9, 10] is precise and reliable. They investigated several methods and systems for obtaining information from social networks and concluded that the best technique is web scraping.

2.2 Overview of Web Scraping Methods and Tools

In their research, Anand V. Saurkar, Kedar G. Pathare, and Shweta A. Gode (2018) found the newest method called web scraping. Web scraping is a crucial approach for creating organized data from unstructured data available on the internet. Structured data produced via scraping is gathered, assessed, and stored in a central database spreadsheet. According to the publication [2], authors mainly focused on the web scraping data extraction process and various web scraping methodologies. The authors in their publications [7] and [8] discussed the fundamentals of web processing. The paper's conclusion lists the several technical tools available for efficient web scraping in the market.

2.3 E-Negotiator Chatbot for E-commerce Websites

In their paper "E-Negotiator Chatbot for E-commerce Websites" published in 2019,

Rushikesh Khandal and Shashank Sombansi [3] stated that chatbots have established themselves as a powerful tool for enhancing customer satisfaction as well as an unrivaled resource for businesses that can help them save a time and money. Customer service will improve by implementing chatbots in the quickly expanding e-commerce sector. Both linguistic and logical challenges come up during negotiations. Chatbots are more user-friendly since sellers often negotiate a new discount price if an initial offer is rejected by the buyer.

2.4   Sentiment analysis using product evaluation data

When the subjective contents are retrieved, according to Xing Fang and Justin Zhan [4], they are composed of sentiment phrases at least contain one good or negative word. Each English word in these sentences has been tokenized. Tags are employed with the parts of speech included in the words. Sentiment tokens and scores are data that were taken from the original dataset during the feature vector creation process. They are referred to as features. The features must convert into vectors known as feature vectors to categorize them. The sentiment analysis [5, 12] methodology is also used in real-life applications like healthcare [11] and social media [6]. Sentiment analysis plays a key role in understanding user emotions, and many classification applications use sentiment analysis to estimate the user's opinions.

3   PROPOSED METHODOLOGY

Our project takes advantage of web scraping, price negotiator using a chatbot, and review analysis to provide a hands-free experience to the users by automating every task manually. By opening the application (Adite-Experience the difference), the customers can search for the list of products wishes to order, customer can negotiate the price. The name "Adite" means to encourage customers to add it to the e-commerce site where it refers to products. To implement this application flask framework is used as a backend framework. Web scraping technique used to collect the data. Our application used Hyper Text Markup Language code to structure web pages and their content. Review analysis plays a role by considering main factors such as ratings, reviews, and price. The main difference between the existing e-commerce websites and our application is the products displayed on the

website are highly filtered by considering several features and a user-friendly rule-based chatbot for price negotiation.
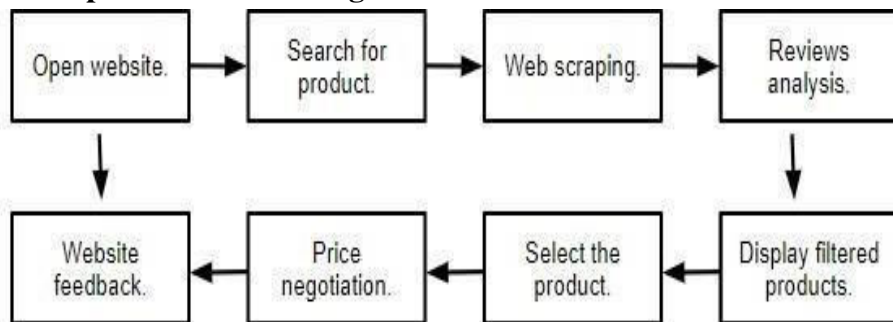
3.1   Description of a block diagram

Fig. 1 Processed block diagram

3.1.1   Open the website

Customers or administrators enter the world of online e-commerce by opening a website. The first web page on our website is the home page. It displays site information to users, provides the interface to other web pages, and performs several tasks.

3.1.2   Search for product

The majority of users are search-obsessed. The search bar is essential to the website because it allows visitors to quickly find what they are looking for. Customers can use the website's search bar to find the products they want.

3.1.3   Web Scraping

Web scraping involves extracting information from numerous websites. This process can be done either manually or through automated means such as software programs or scripts. Scraping is a great way to quickly and easily collect large amounts of data. Figure 2 is a flowchart of web scraping. When a user (customer or seller) searches for a product on our application, it will redirect to the Amazon and Flipkart e-commerce websites, and the web scraping process for that product the user is looking for begins. Selenium [13] is utilized to retrieve data from the Amazon website during Amazon web scraping. Beautiful soup extracts information such as name, price, features, reviews, ratings, and image

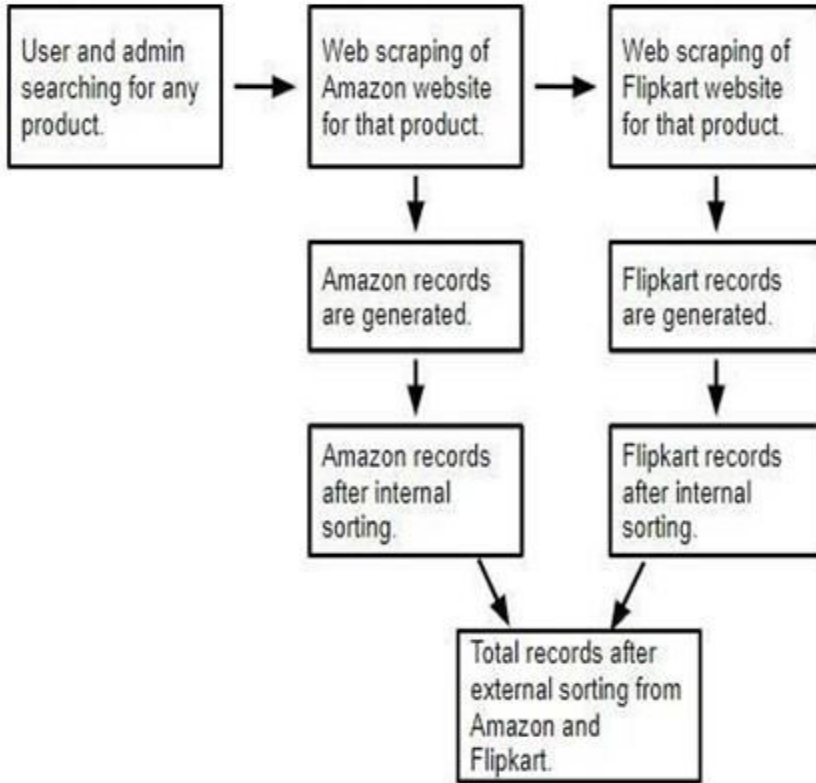links. Similarly, Flipkart web scraping is done.

Fig. 2 Flowchart of web scraping

1.1.1   Review Analysis

From the extracted data of each website, there may be a chance of duplication of data, so internal sorting is done, which includes removing duplicate records by considering features, reviews, ratings, and prices and also fixing the priority of products. If the names and features of products are similar, then the polarity obtained from sentiment analysis on reviews and ratings will be considered because while buying any product on an e-commerce website, we mainly focus on reviews and ratings by other customers and select products even though the price is high. As other customers' opinions matter a lot, more weightage is given to the reviews and ratings to filter and get the product list. If both the reviews and ratings are similar, then the price is taken into consideration. The similarity between the features found using

the tokenization method.

1.1.2 Display-Filtered Products

After performing the review analysis on extracted product data within the websites, the review analysis was performed again by combining the internally sorted data of each website. The final product data have displayed on the display page of the website.

1.1.3 Select the product

From the displayed filtered list of products, the user can select the desired product. Click on the selected product to view the product description including features and price.

1.1.4 Price Negotiator

To attract customers price negotiation plays a vital role. To serve this purpose on e- commerce websites chatbots can be used by customers. Especially in the industrial goods sector, price negotiations are often a fixed upstream component of the conclusion of a contract. By considering the seller's specific profit, the seller can set a profit margin for each available product. Up to this percentage, the customer can negotiate the price of the product. It benefits both customers and sellers. The chatbot here is the rule-based chatbot.

1.1.5 Website Feedback

Implementing user feedback is especially important to improve any website. It helps the admin to improve their business. Our website also provides a reviews webpage and rating page for customers who actively participate in writing reviews, tend to give star ratings, and build loyalty to the business. It gives customers the freedom to provide valuable feedback that helps a company improve its products and services. The reviews page often displays the top five reviews and the review analysis bar. The rating page also shows the overall rating of the website and the count of users for each star. The rating page and reviews page is updated after every customer rating and review submission. It permits the admin to understand the customer's opinions and make any modifications to the website. It is also beneficial for new customers to know about the website.

2 RESULTS AND DISCUSSIONS

2.1 Home page

The home page is the primary web page of our website and has many tasks to perform. It tells users what the site is about and provides an easy way for customers to find out why they came to the site.

Fig:3 Home Page

The search bar which is shown in figure 4 is essential to the website because it allows visitors to find what they are looking for faster. Customers can find the products they want by using the search bar. Our website search bar can be found on the home page.

Fig 4: Search bar

Display Page: On the display web page, all records for the product the user searched for are displayed. All this product data is collected using web scraping. All product records are displayed with the price and short description. Figures 5 and 6 are the results on the display page of our application for a user-searched item named fast track watches for woman

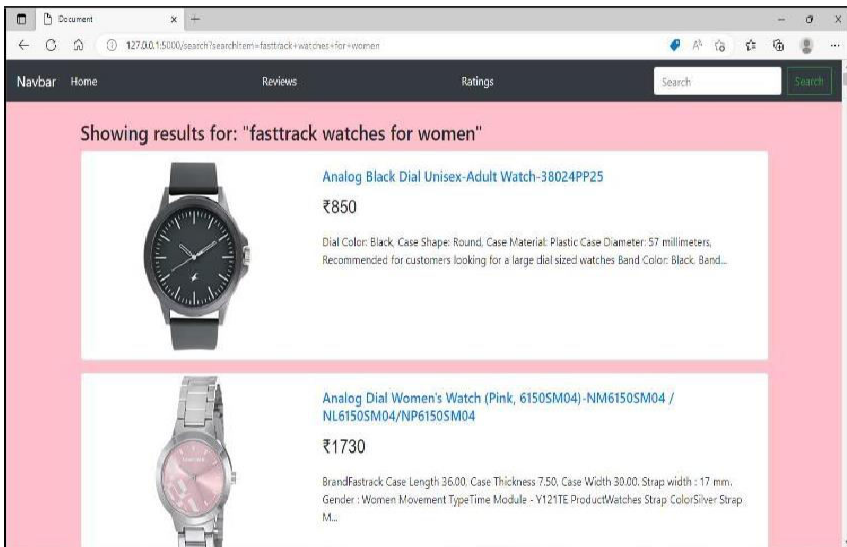**Fig. 5** Display page of Fastrack watches for women
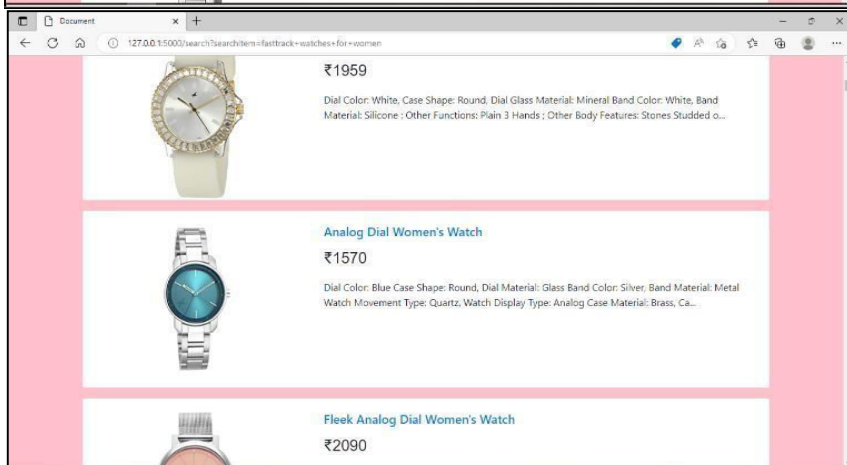
Fig. 6 Different sets of Fastrack watch on the display page

2.2 Product page

The product webpage displays information about the individual product and provides a button to activate the chatbot for that specific product. The product page consists of a brief description of the product details. It also has the option of a chatbot to negotiate the price. If the users want to negotiate the price, they can click the chatbot button. Figure 7 shows Analog Dial Women's Watch features details with a price of Rs. 1570 on the product page of our application and also consists of a chatbot button.
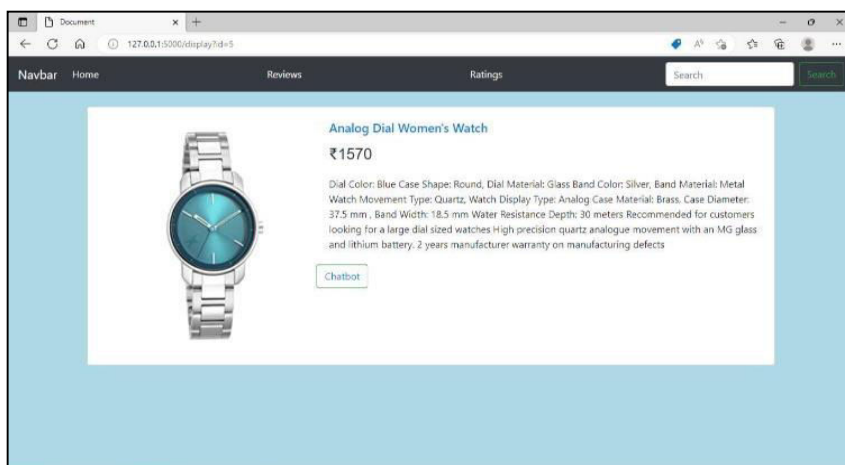
Fig. 7 Product page

2.3 Chatbot page

The chatbot webpage was extremely designed for customers. A chatbot page is a user interface where customers can negotiate the product price. Here we have considered five percent as the maximum profit margin for the seller. Customers can negotiate the price any number of times, which makes them feel more user-friendly. A rule-based chatbot designed for our application. Figure 8 depicts the original price information of the item, and the textbox is displayed. Figure 9 was the updated chatbot page when the user entered yes as the input in the textbox, and another text box was displayed to enter the user's wished price of the product.
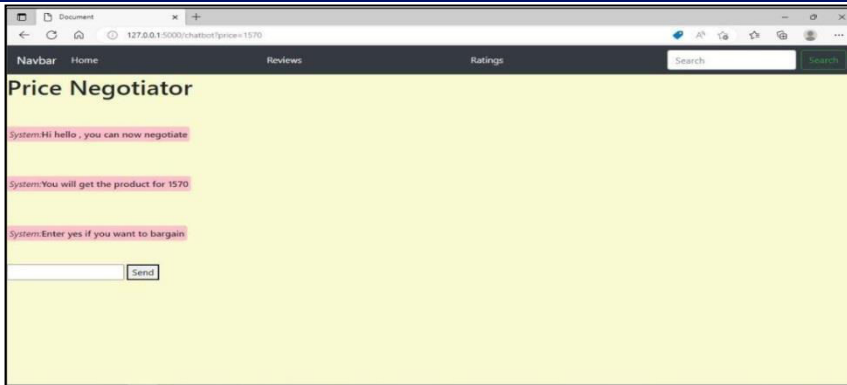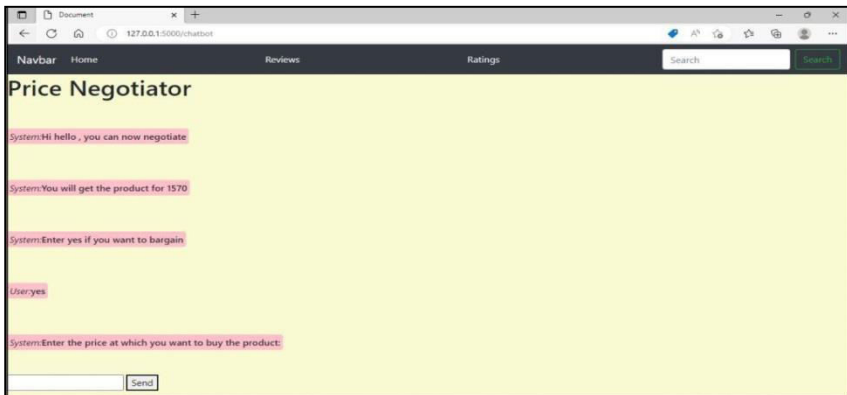
Fig. 8 Chatbot page

Fig. 9 Chatbot page after customer input as yes

Fig. 10 Negotiating the price for the product by a customer on the chatbot page

Figure 10 displays the information when the user entered a price of Rs. 1500 in the text box and presses the submit button, the end of price negotiation can be seen in figure 11 and the final price of the product is Rs. 1500.
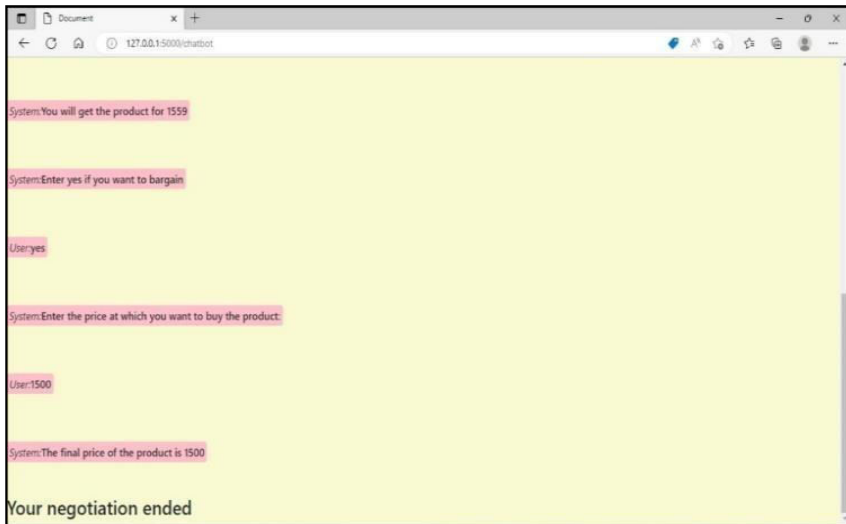

Fig. 11 End of negotiation on the chatbot page

2.4 Reviews page

The reviews webpage is for customers willing to write reviews and tends to increase loyalty to the enterprise. It allows users to feel they have the freedom to provide precious remarks to assist a company in enhancing its products or services. The reviews page also displays the top five reviews frequently and the review analysis bar. The reviews play an essential function to enhance the business. Adjustments are made basedon the user's suggestions to draw a great range of customers which in, flip increase thesales of products.
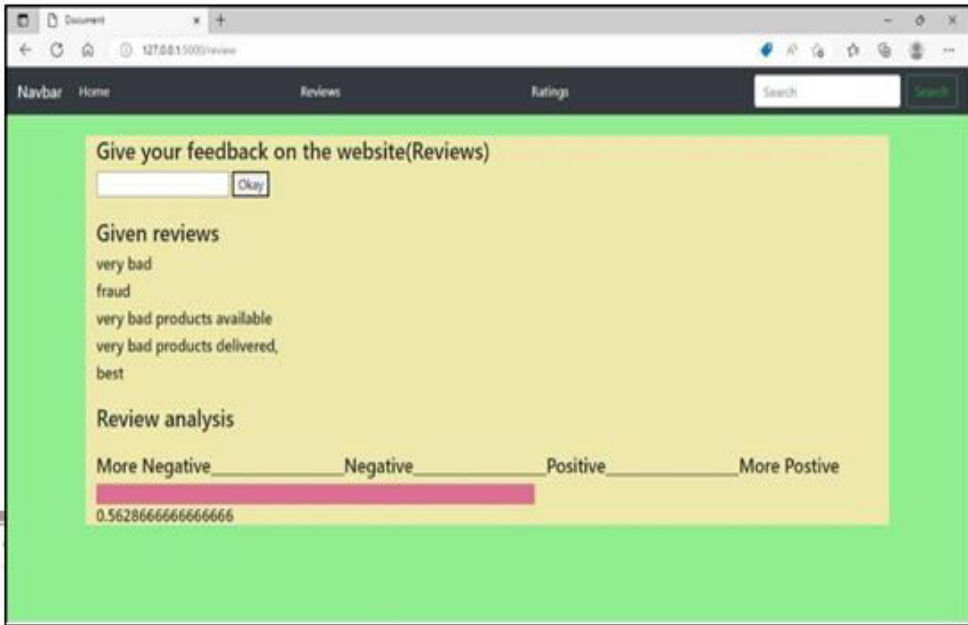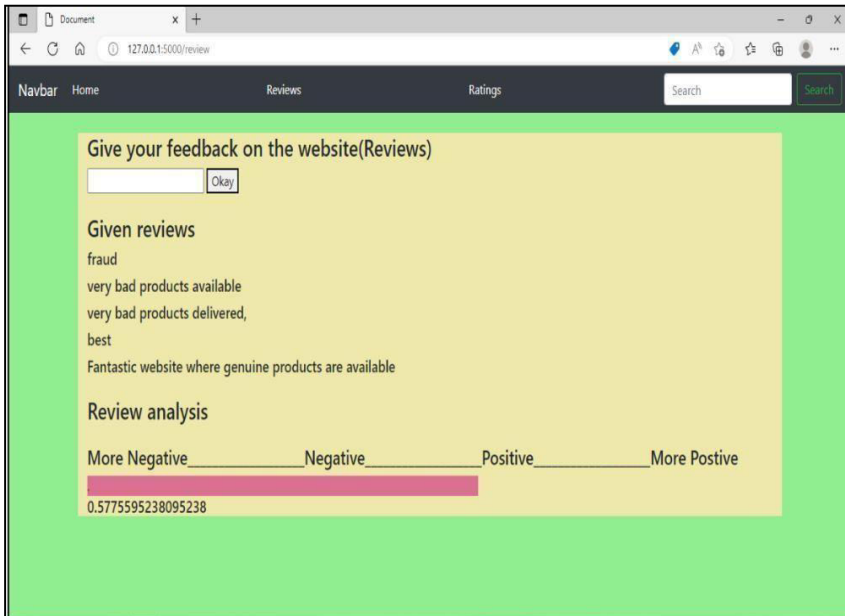
Fig. 12 Reviews page

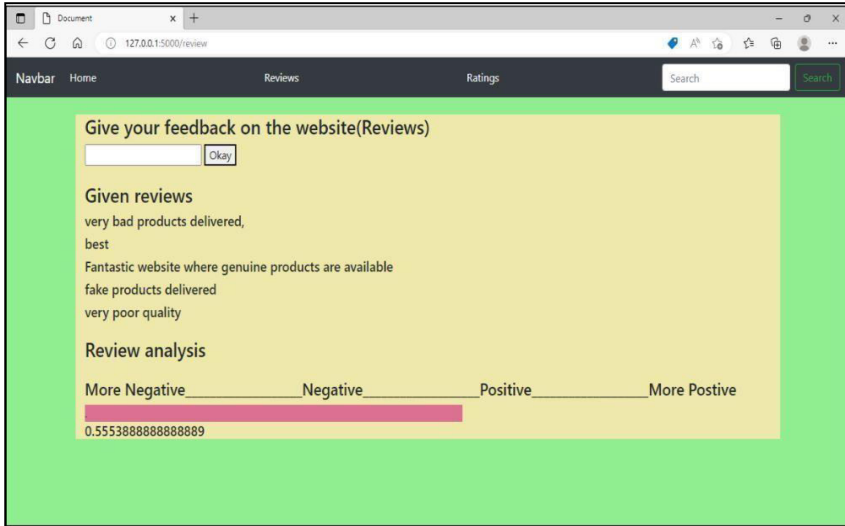**Fig. 13** Reviews page after submitting a positive comment

Fig. 14 Reviews page after submitting negative comments

2.5 Rating page

The rating webpage is for the customers to provide feedback on the website. Feedback can either be in the form of textual reviews or star ratings. The rating page shows an overall rating of the application and the count of users for each star shown in figure 15. Ratings are more likely used by customers. The rating page is updated after every customer rating submission.
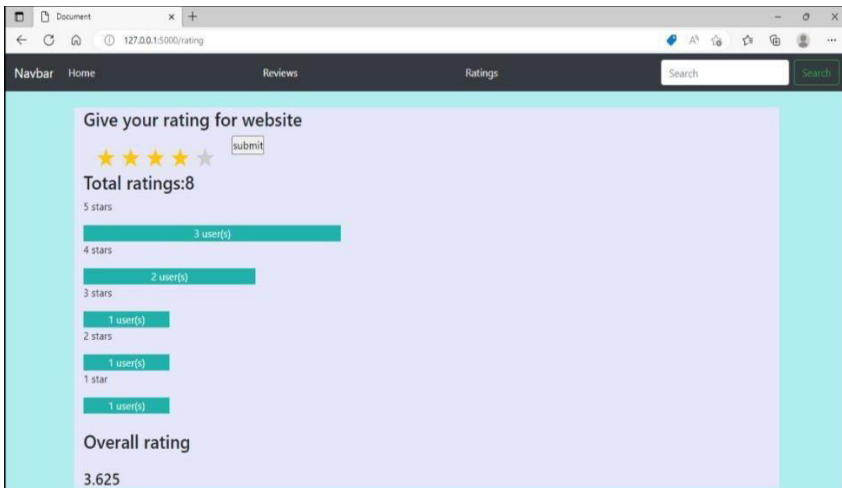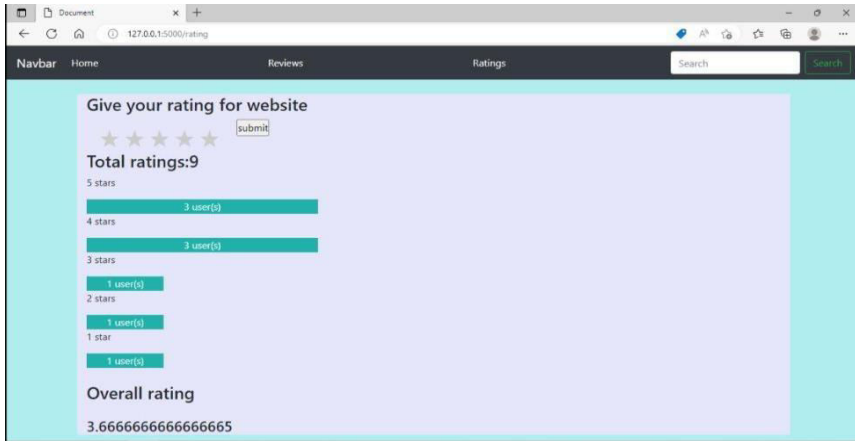

Fig. 15 Rating page

Fig. 16 Rating page after updating

3   FUTURE SCOPE

In the future, the project will expand by adding a login page for admins and registered customers using artificial intelligence privacy algorithms. The products' names, descriptions, features, warranties, add-on products, delivery dates, and other information can add by the admins so that the product data is available for admins to see and modify as necessary. Administrators can also check sales statistics and order data. For customers to create a legitimate username and password, they must first register with basic registration information. The product recommendation features will be added to make it more user-friendly.

4   CONCLUSION

E-commerce has become popular and evolved after many years of development. But to meet new problems, the e-commerce system of the future must advance beyond the fundamental features such as a static website with an electronic catalog and/or a shopping cart towards an intelligent, dynamic, and secure commerce system. The designed application seeks to save time searching for a one-stop e-commerce website that is friendly to customers and users. In this web scraping project, data from the websites on Amazon and Flipkart are collected and sorted internally and externally to show the best results for the products customers are looking for. We added an innovative feature for

our application named rule-based chatbot with a price negotiator, so if the price is satisfied by the customers, the demand for sales increases which internally increases the seller's profit.

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