

PRICE NEGOTIATING CHATBOT ON E -COMMERCE WEBSITE

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***Abstract:** In recent years, online shopping has gained a huge boom, but some features like negotiating with shopkeepers are not available. To avoid this, a chatbot has been implemented which interacts with customers and assists them to get a satisfactory price on product(s). To ensure accuracy, an algorithm has been developed which works along with prediction of old available data to provide a price. Price prediction has less accuracy at times due to either irrelevant features/attributes of data or some algorithms are not suitable for a particular dataset. Ecommerce business does not directly rely on price prediction systems since even a wrong prediction of a single product can result in business losses. Some models also fail when data scales or some feature is unavailable after time on which model prediction was dependent. The chatbot system has tried to resolve some of these issues.*

Keywords: Chatbot, e-commerce website, machine learning models.

I. INTRODUCTION

E-commerce websites today apply various AI techniques to determine most liked products or most sold products which eventually are calculated to provide an effortless search for customers shopping on their website. But at times when the best products are sold at high prices,

customers have to compromise on their product. There are also some other problems that customers may face on low-cost products. These problems can be eliminated by giving them an opportunity to negotiate on the products. Negotiation is a combination of both linguistic and reasoning problems. Negotiation is the

process of exchanging the highest likelihood of satisfying the needs of both parties [3]. The first party i.e., product seller will provide a minimum price along with the product data that he/she can afford to sell the product at. This price and the product price before negotiation (original price) are the limits for our algorithm. The chatbot is implemented on the website which uses flask APIs to connect to UI so that we can depict real life implementation of our model. A chat bot is an artificial intelligence (AI) software that can simulate a natural language conversation (or chat) with a user via messaging applications, websites, and mobile apps, or by telephone[1]. Chatbots can solve most of the customer queries without need for a customer executive. The chatbot uses NLP techniques to identify the user intent and replies accordingly. Besides all these practices, chatbot will also automate the process of negotiation on Ecommerce websites. Such a system will help the users to freely interact with the software and upload their product related queries and budget to get the response related to the query. Just like retail and logistics companies use data to plot the most efficient route to deliver goods [5]. It will bring a huge impact on

sales and number of customers on the website. The customers will most likely increase due to getting online products at their fair prices.

II. LITERATURE SURVEY

The features of online shopping are developed but some features like negotiating with shopkeepers are not available which is sometimes possible in offline purchasing. We have implemented a chatbot for negotiating on the products. The chatbot interacts with customers and assists them to get a satisfactory price on product(s). With such a system, which impacts on major areas of online shopping there are possibilities in which either the seller of the product or customer's budget gets compromised. To avoid such situations, we have developed an algorithm which works along with prediction of old available data to provide a price. Price prediction has less accuracy at times because either irrelevant features/attributes of data are used or some algorithms are not suitable for a particular dataset. Due to this, Ecommerce business does not directly rely on price prediction systems since even a wrong prediction of a single product can result in business losses.

Artificial intelligence (AI) has been used to develop and advance numerous fields and industries, including finance, healthcare, education, transportation and more. However, in the business negotiation field, such as bargain, the AI has not yet exerted its power. In order to explore the application of AI into business negotiation, we have built an intelligent robot that can help customers that lack negotiation skills when bargaining in their shopping sceneries. 3 This bot can make decision by itself via price prediction function implemented by machine learning algorithms and the tool of decision tree. As a result, our bot has got a positive performance during a used car trade. Although the algorithm of the project is relatively simple, its main contribution is to show the potential application of AI in the business negotiation. We believe that it can provide ideas and directions for the future development of business negotiation robot.

III. PROPOSED SYSTEM

We have used the dataset of e-commerce items containing the price of products and their minimum prices i.e min price which will be used for negotiating. The website for demonstrating the working is made upon HTML, CSS, JavaScript for front

end while the backend uses Flask. Database is made by MySQL. In an E-commerce website the customers select the product(s) that they wish to buy, then they proceed with ordering the product(s). On our website we have added the chatbot where they purchase the product by placing a button to negotiate. 5 The offer price will be then stored when they are satisfied. They can select whether they want to buy that product or add the product to cart and see for another product(s). Customers judge the products on E-commerce websites by various factors such as ratings, price, reviews, etc. But for some customers, price plays a crucial role in the decision for purchasing a product.

SYSTEM ARCHITECTURE

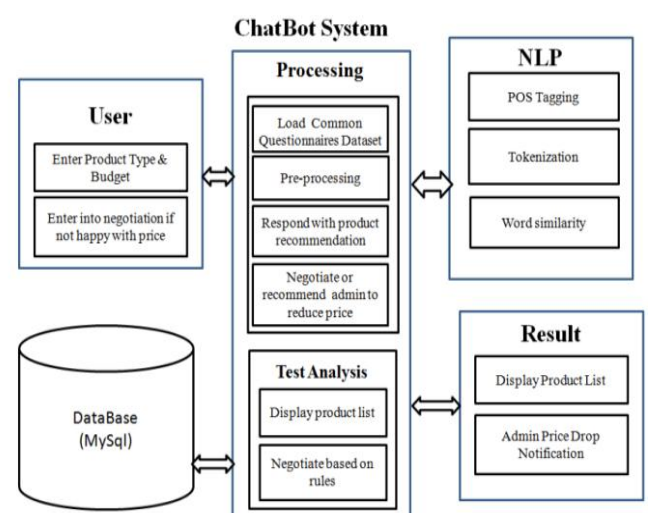


Fig.1 System architecture

Modules:

The modules and their descriptions that are used in the project are:

- **Signup-** This module is used to generate the signup page for the website we are creating. This includes basic details such as username, password, phone number, email id, address, and gender. After filling these details, the user can register and create an account in the website.

- **Login**

After the user registers with the website, the user now goes to the login page. Where the user can log in to the website using the username and password that were used at the time of registration. These details are stored in the backend, i.e., database. When the user logs in with their details, the details are matched with the ones in the database. If they are matched, the user can log in to the website. If not, they will get an error message that the details are mismatched. If there are no details of the user in the database, the user will be prompted to sign up.

- **Browse Products**

When the user logs in successfully he can now see this module which displays the list of the available products that are for sale on the website.

- **View Order**

This module helps the user to view all the orders that are placed by him in the past

- **Chatbot**

This module contains two parts: text-based and voice-based. In every product description, the user can find these two options. A text-based chatbot works on the input text that it takes from the user, and a voice-based chatbot uses the user's voice as input. Both chatbots are used to negotiate for the best price.

- **Post Review-** This module helps the user post a review about any product he buys or chooses to post a review about. The sentiment of the review can be seen as positive or negative after posting the review successfully.

- **View Reviews-** This module helps the user view all the reviews and their sentiments that are available.

- **Logout –** This module helps the user to logout from the website

Support Vector Machine(SVM)

Support Vector Machine or SVM is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems. However, primarily, it is used for Classification problems in Machine

Learning. The goal of the SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. This best decision boundary is called a hyperplane.

SVM can be of two types:

Linear SVM: Linear SVM is used for linearly separable data, which means if a dataset can be classified into two classes by using a single straight line, then such data is termed as linearly separable data, and classifier is used called as Linear SVM classifier.

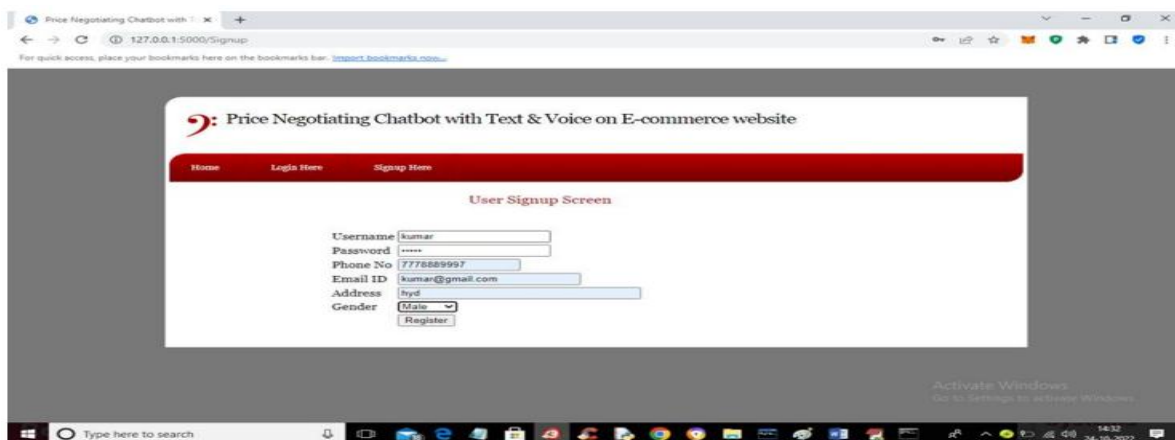
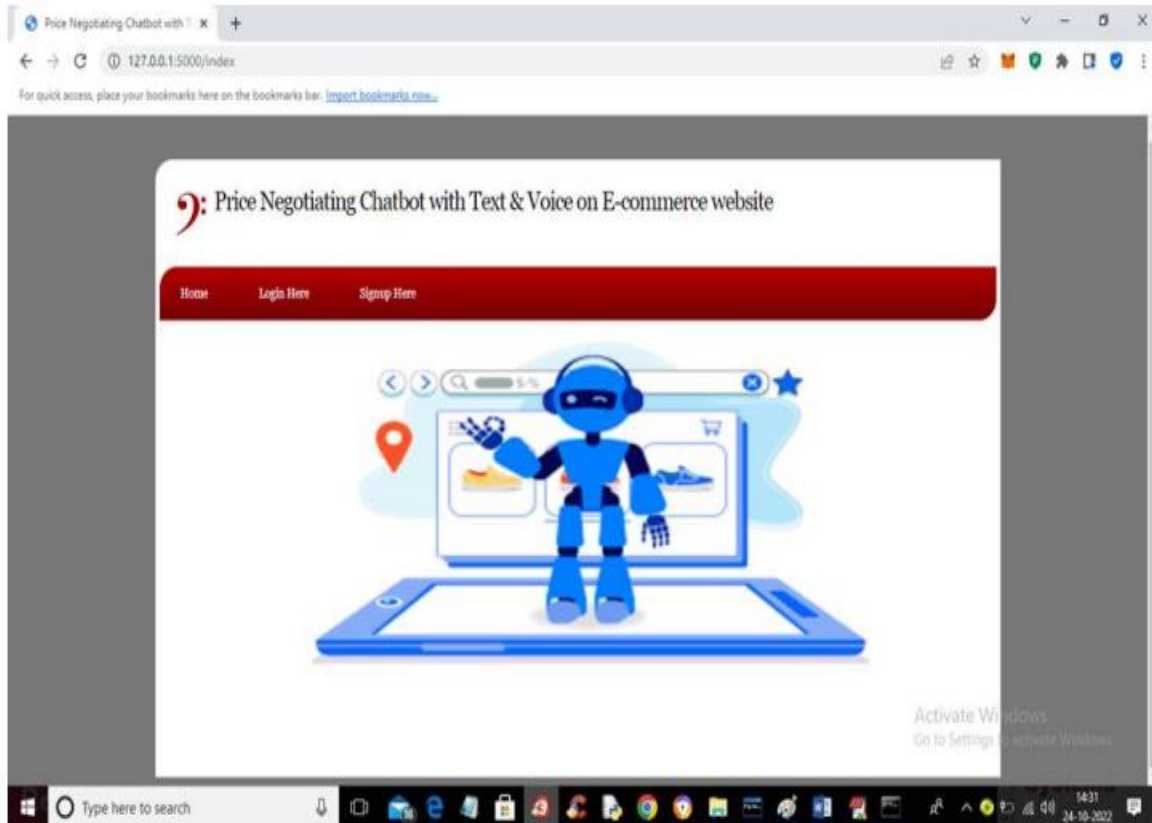
Non-linear SVM: Non-Linear SVM is used for non-linearly separated data, which means if a dataset cannot be classified by using a straight line, then such data is termed as non-linear data and classifier used is called as Non-linear SVM classifier.

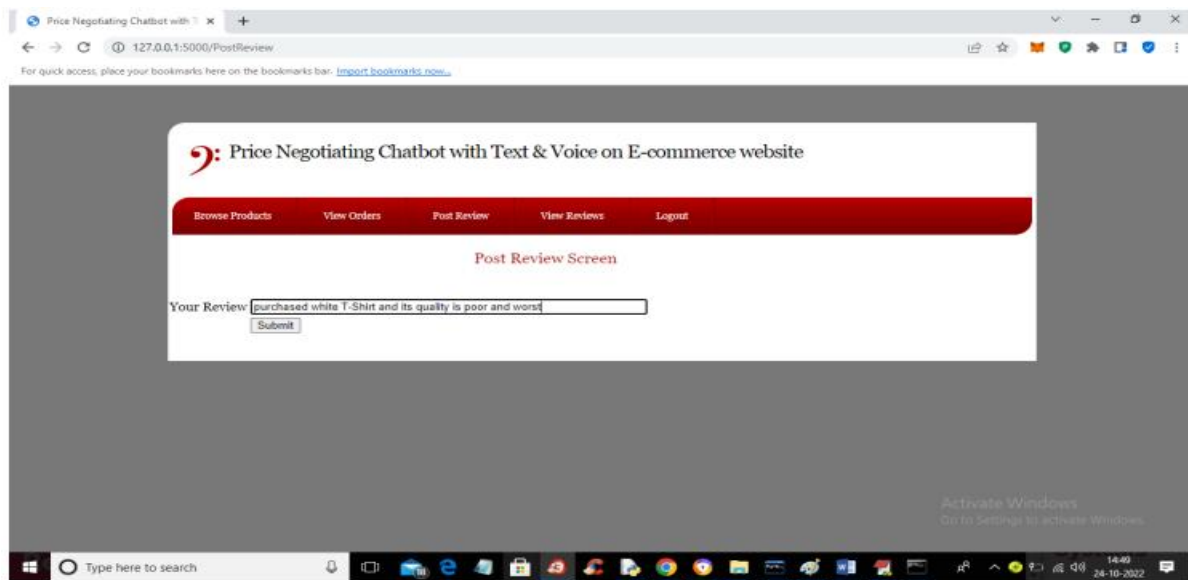
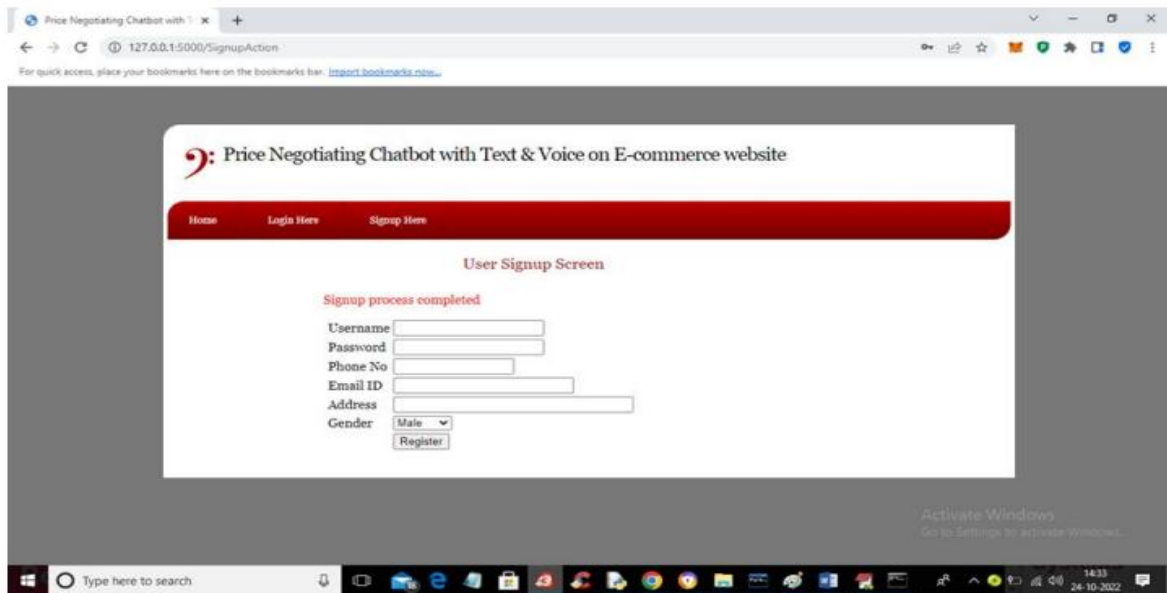
K-Nearest Neighbors (KNN)

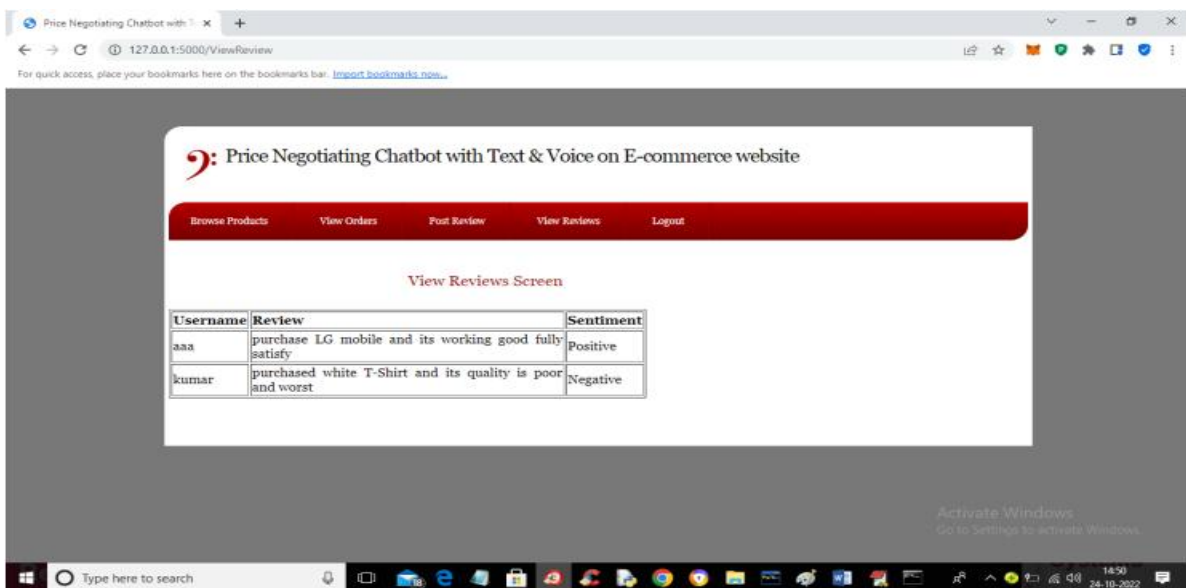
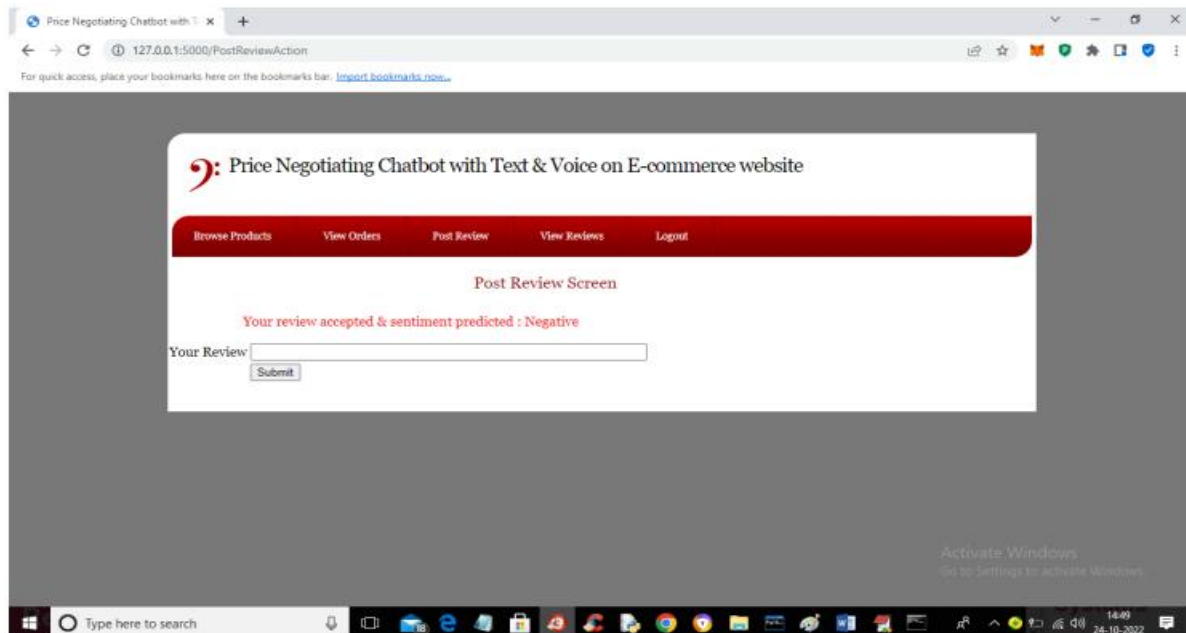
The k-nearest neighbors (k-NN) algorithm is a simple, non-parametric supervised learning algorithm that can be used for both classification and regression problems. It works by finding the k most similar training examples to a new data point, and then predicting the label of the new data point based on the labels of the k nearest

neighbors. The k value is a hyperparameter that must be chosen by the user. A small k value will result in a more complex model that is more likely to overfit the training data, while a large k value will result in a simpler model that is more likely to underfit the training data. The optimal k value will depend on the specific dataset and the desired trade-off between bias and variance. k-NN is a lazy learning algorithm, which means that it does not build a model during the training phase. Instead, it stores the entire training dataset and then uses it to make predictions during the testing phase. This makes k-NN a very fast algorithm, but it can also make it more computationally expensive to train.

IV. RESULTS







V. CONCLUSION

The negotiation on products is a challenging task when it comes to e-commerce systems. We tried a primary chatbot that covers many

aspects and cases for negotiation but is not evident to provide the best results. We created a website in order to implement the chatbot. The website we built offers basic

functionalities like sign-up, login, and logout. The website also offers other functionalities like Browse products, view orders, post reviews, and view reviews. The user can negotiate with the chatbot for a price reduction on the selected product. The user can negotiate up to a certain extent and can directly purchase the product at the minimum price the chatbot can offer. Then the user can post and view the reviews. A survey of e-commerce customers found that a majority of customers would be interested in using a price-negotiating chatbot. A number of existing systems and opensource projects can be used to implement price-negotiating chatbots. These systems and projects offer a variety of features and capabilities, and businesses can choose the system or project that best meets their needs. The project has the potential to increase sales by helping customers find the best possible prices on the products they want. The project can also improve customer satisfaction by providing a convenient and easy way to negotiate prices. Finally, the project can reduce costs by freeing up customer service representatives to focus on other tasks.

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