

INTELLIGENT CHATBOT FOR PRICE NEGOTIATION IN E-COMMERCE USING MACHINE LEARNING

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Abstract

The rapid growth of online shopping has transformed the way consumers purchase products, offering convenience and a wide range of choices. However, unlike traditional offline markets, online platforms lack the ability for customers to negotiate prices directly with sellers. This limitation reduces user engagement and flexibility during purchasing. To address this gap, this work proposes an intelligent chatbot system designed to simulate real-time price negotiation between customers and sellers. The chatbot interacts with users, understands their budget preferences, and suggests optimized product prices through a data-driven approach. To ensure fair pricing, a predictive algorithm is integrated that analyzes historical transaction data and market trends. This helps balance both customer expectations and seller profitability. One of the major challenges in such systems is maintaining prediction accuracy, especially when dealing with irrelevant features, changing data patterns, or missing attributes over time. The proposed system incorporates adaptive learning techniques to handle such issues and improve reliability. By combining natural language processing with machine learning models, the chatbot enhances user experience while maintaining pricing efficiency. The overall system aims to bring the flexibility of offline bargaining into the online shopping environment, making e-commerce more interactive and customer-centric.

Keywords: price negotiation, e-commerce, chatbot, machine learning, natural language processing (NLP)

I INTRODUCTION

In the fast-paced world of e-commerce, where competition is fierce, and consumer expectations are ever-evolving, the ability to offer a personalized, engaging, and interactive shopping experience has become the holy grail of online retail. With this aim in mind, we introduce the "Price Negotiating Chatbot with Text & Voice on E-commerce website" project, a

groundbreaking initiative poised to redefine how customers shop and negotiate prices in the digital realm. E-commerce has transformed the way we buy products, providing unparalleled convenience and access to a vast array of goods. However, it has also presented new challenges, such as how to replicate the personalized and dynamic nature of in-store shopping online. The answer lies in the fusion of cutting-edge technologies: chatbots, natural language

processing (NLP), and voice recognition. Our project revolves around the development and integration of an advanced chatbot system into an e-commerce website, one that seamlessly converses with customers using both text and voice interfaces. This chatbot, armed with the power of AI-driven NLP, is not just a virtual assistant but a dynamic price negotiator. It engages customers in real-time dialogues, allowing them to negotiate product prices, request discounts, and seek personalized recommendations—all in a natural and conversational manner.

II LITERATURE SURVEY

Conversational Chatbots in E-commerce

- ❖ In recent years, e-commerce businesses have increasingly adopted conversational chatbots to enhance customer engagement and satisfaction.
- ❖ These chatbots, often powered by natural language processing (NLP) and machine learning, enable real-time interactions with customers, providing assistance, product information, and recommendations.
- ❖ Research indicates that such chatbots can significantly impact customer retention and sales conversion rates.
- ❖ Moreover, chatbots have evolved to handle price negotiations, a crucial aspect of the online shopping experience.
- ❖ This project aligns with a growing body of literature that explores the integration of AI-

driven chatbots into e-commerce platforms, offering customers the ability to negotiate prices and receive personalized discounts.

- ❖ Studies have demonstrated that customers appreciate the transparency and convenience offered by these chatbots, leading to increased customer loyalty and higher sales volumes.

Multimodal Conversational Interfaces

- ❖ The integration of voice and text-based chat interfaces in e-commerce is a trend that has gained momentum in recent years. While text-based chatbots have been prevalent, voice recognition technology has enabled a seamless transition between text and voice interactions. This multimodal approach caters to diverse customer preferences, providing a more natural and intuitive shopping experience.
- ❖ Existing literature highlights the importance of multimodal conversational interfaces in e-commerce, as they facilitate real-time communication; enable price negotiations, and offer personalized product recommendations. This project aligns with the findings of these studies, demonstrating how the integration of text and voice interfaces in an e-commerce chatbot can enhance user engagement and satisfaction. It also addresses the need for research on the effectiveness of such interfaces in improving sales and customer loyalty.

- ❖ These literature reviews provide a foundation for the "Price Negotiating Chatbot with Text & Voice on E-commerce website" project by highlighting the significance of conversational chatbots in e-commerce and the advantages of multimodal interfaces. They also underscore the potential benefits of incorporating price negotiation capabilities into such chatbots to optimize the online shopping experience and drive business growth.
- ❖ Ai Based Shopping System for Price Negotiation Using Chatbot System and Computer Science This paper contain the unreal intelligence based online shopping system. Around 80% of world consumers try online shopping, this is often the best opportunity for e-commerce companies is to make extended lasting and profitable relationship with this already existing audience.
- ❖ Such a powerful relationship requires utmost specialize in the customer as a full and making sense of a flood of real time information that goes well beyond demographics or shopping behaviour.
- ❖ There are two entities who will access the system. One is that the admin and another one are the registered user. User can select the specified product and consider its details and raise cart if he/she wishes to shop for the merchandise. User can even ask queries to AI Bot for bargaining associated with price and regarding any product details and bot will return the query lead to variety of text to speech.\
- ❖ GENIUS: An Integrated Environment for Supporting the planning of Generic Automated Negotiators
- ❖ We evaluated the method of the agents design by requiring engineering undergraduate and graduate students to style
- ❖ automated agents. These agents were matched twice during a tournament with all other agents.
- ❖ To validate the efficacy of the 2 different mechanisms available in GENIUS – the analytical toolbox and also the repositories of domains and agents – after each tournament, the scholars were exposed to only 1 of those mechanisms and were allowed to re-design their agent. Towards Automated Negotiation Agents that use Chat Interface This project aligns with the findings of these studies, demonstrating how the integration of text and voice interfaces in an e-commerce chatbot can enhance user engagement and satisfaction. It also addresses the need for research on the effectiveness of such interfaces in improving sales and customer loyalty.
- ❖ They also underscore the potential benefits of incorporating price negotiation capabilities into such chatbots to optimize the online shopping experience and drive business growth.

❖ Also point to the shortcomings identified in the relevant literature, particularly limitationstheblockchaintechologypresentsand howtheseliminationsspawnacross different sectors and industries. Building on these findings, identify various research gaps and future exploratory directions that are anticipated to be of significant value both for academics and practitioners.

III EXISTING SYSTEM

A. Parsing Data and Pattern Matching Data:

This is the process of taking data in one format and transforming it into another format. In this system the researchers use this as a process to determine whether a string that a user give as an input has been formulated, with respect to the syntax rule. Therefore, by using this the query input given by the user is converted to the format of questions data that is already stored in the base knowledge of the chatbot. After converting the query by data parsing the data pattern matching is used to analyse relevant text. This is done by forming a pattern to extract useful information for providing a required answer of the query and removing irrelevant details.

B. Artificial Intelligence Markup Language (AIML): In this system this is used by researchers as it helps to create human interfaces while keeping the implementation simple to

program which can easily be used by humans. This can also help Chat bot to provide the user with relevant answer irrespective to the programming language used, as this system contains a collection of pre-defined/stored patterns.

Disadvantages

Less Parsing Data and Pattern Matching Data

Manual Price Negotiation

Artificial Intelligence Markup Language

Communication Challenges

IV PROBLEM STATEMENT

In the ever-evolving landscape of e-commerce, providing customers with personalized and interactive experiences is crucial for enhancing user satisfaction and increasing sales. Our current challenge lies in the absence of a responsive system for negotiating product prices on our E-commerce website. To address this, we aim to develop a dynamic and versatile Price Negotiating Chatbot capable of handling both text and voice interactions seamlessly within our existing website infrastructure. The envisioned chatbot should empower users to initiate price negotiations for products of interest, presenting them with an engaging and interactive platform. Users should have the flexibility to negotiate through conventional text input or voice commands. Furthermore, the chatbot needs to be

integrated with our E-commerce website to fetch product details, process negotiations,

and update prices accordingly. The key features include supporting both text and voice interactions, integrating with the E-commerce website, providing dynamic responses to user inputs, ensuring secure authentication, and scalability to handle concurrent negotiations.

V PROPOSED SYSTEM

User select the product that he/she wants to buy, and get some doubts related to the product and as well as feels that the price of the product is out of their budget. User than select the option to negotiate and clarify the queries related to the product with the AI chat-bot of that e-commerce site. The user can chat with the e-commerce bot and input the queries they have without concerning or involvement of any customer executive.

Chat-bots can solve most of the customer queries without the interference of customer executives. Since it is a combination of both linguistic and reasoning problems hence it requires an intention for something which needs to be verbalized. Dialogue roll-out is a concept for developing long term planning dialogue agents. This will aim to make a conversation between both human and machine and as well as design and development of e-commerce site. It will help to create a link between the user and

the bot and also a dialogue performs a task that can represent part of or a complete conversational thread.

Advantages:

- Getting the query from the user
- Dialogue roll-out
- Sentiment Analyzer & Real time price Adjustments
- Natural Language Processing (NLP)

VI IMPLEMENTATION

Service Provider: In this module, the Service Provider has to login by using valid user name and password. After login successful he can do some operations such as Login, Browse Data Sets and Train & Test, View Trained and Tested Accuracy in Bar Chart, View Trained and Tested Accuracy Results. And view All Remote Users.

View and Authorize Users: In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

Remote User: In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password. Once login is successful user will do

some operations like register and login, predict.

The implementation of Price Negotiating Chatbot with Text & Voice on E-commerce website is done using both frontend and backend with the use of NLP algorithms.

Voice Input/Output: Voice Recognition: Used Web Speech API or a similar library for voice recognition on the frontend.

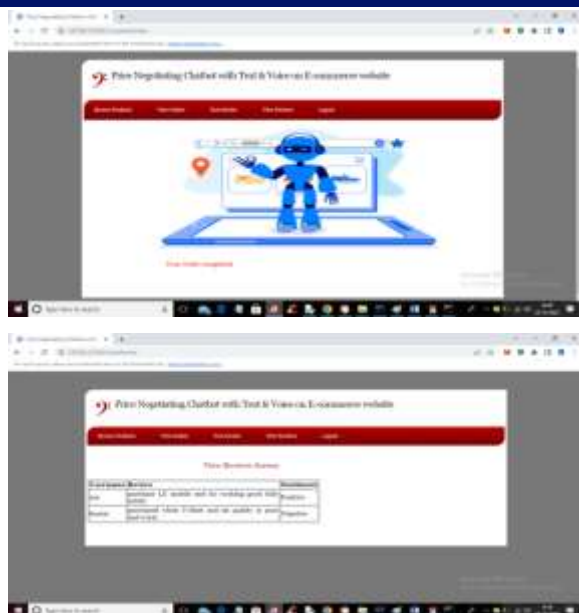
Text-to-Speech: Implementing text-to-speech NLP functionalities to allow the chatbot to respond with voice on supported browsers.

VII RESULTS



Product Name	Product Price	Product Image	Product Description	Product Category
10000	10000		10000	10000
10000	10000		10000	10000
10000	10000		10000	10000





VIII CONCLUSION

The negotiation on products is a challenging task when it comes to e-commerce systems. We tried a primary chatbot. The chatbot which we created sometimes falls to the price customers ask for though it is always greater than minimum price but may result in loss for seller if it goes the same for many customers. Such situations have to be handled. We used various algorithms such as KNN but in future there may be some better price prediction algorithms which can be used. The ways in which a user can better negotiate with chatbot and get cheaper prices. Such cases should be handled. KBAgent is considered to be better when it comes to negotiation, this can be added to our application. An example can be Apple's Siri which has huge knowledge base to provide satisfactory outcomes. Here we

represent a Negotiator chatbot for E-commercial websites which might help the users to urge the merchandise online consistent with their budget.

Here user can directly interact with the system and acquire the response associated with the query. We are using NLP to know the user query and provides appropriate answer. In future this chatbot may be integrated with major websites with a bit modification. More language processing can be implemented to extend the efficiency of chatbot. Flexible service based architecture are going to be highly desirable for future extension. The chatbot which we created sometimes falls to the price customers ask for though it is always greater than minimum price but may result in loss for seller if it goes the same for many customers. Such situations have to be handled. we used various algorithms such as SVM, KNN but in future there may be some better price prediction algorithms which can be used the ways in which a user can better negotiate with chatbot and get cheaper prices. such cases should be handled.

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