AMERICAN JOURNAL OF MANAGEMENT AND IOT MEDICAL COMPUTING
Peer Reviewed, Referred & Indexed Journal
E-ISSN: 3069-0110
Vol.5, No.2(1) (2026)
www.ajmimc.com

AI CHATBOARD FOR E-COMMERCE WEBSITE

[1]Mr. J.Santhosh Kumar,[2]Erukonda Gayathri,[3]Bandari Ramya,[4]Kunta Apoorva,[5]Ireni Nandini, [6]Soorna Divya

[1]Assistant Professor, Department of Computer Science & Engineering, Princeton Institute of Engineering & Technology For Women

[2,3,4,5,6]B. Tech Students, Department of Computer Science & Engineering, Princeton Institute of Engineering & Technology For Women

ABSTRACT

The AI Chatbot for E-Commerce Support is designed to enhance customer service in online shopping platforms by providing automated, intelligent, and real-time responses to user queries. The system is developed using Python and Flask, integrating a machine learning–based chatbot model to understand customer messages and provide appropriate responses based on predefined intents. The chatbot processes user input through natural language preprocessing techniques such as tokenization and bag-of-words representation, enabling the model to classify user queries and return relevant responses stored in the intent dataset. The application also includes a user authentication and management system implemented using SQLite database, allowing users to register, log in, and manage their profiles securely. Once authenticated, users can access a dashboard and interact with the chatbot through a chat interface designed to assist with common e-commerce queries such as product information, order assistance, and general support. The system maintains session management to ensure secure access and smooth navigation across different pages including dashboard, profile, and chatbot interface. By automating customer interaction, the proposed system reduces the need for continuous human support, improves response time, and enhances the overall customer experience. The integration of machine learning with a web-based framework makes the chatbot scalable and efficient for handling multiple user queries simultaneously. This solution demonstrates how intelligent conversational agents can significantly improve support services in modern e-commerce platforms.

Keywords: Artificial Intelligence (AI), Machine Learning, Chatbot, E-Commerce Support, Natural Language Processing (NLP), Flask Framework, Python, Tokenization, Bag-of-Words, Intent Classification, Customer Support Automation, Web Application, User Authentication, SQLite Database, Session Management, Conversational AI, Real-time Response System, Intelligent Systems, Query Processing, Customer Experience Enhancement.

I. INTRODUCTION

The rapid growth of e-commerce platforms has significantly increased the demand for efficient and responsive customer support systems. Customers frequently require assistance regarding product information, order status, return policies, payment methods, and other service-related queries. Traditional customer support systems rely heavily on human agents, which can lead to delays in response time, increased operational costs, and limited availability. To overcome these challenges, many organizations are adopting Artificial Intelligence (AI) based chatbot systems to provide automated and continuous support to customers.

An AI chatbot is an intelligent software application that simulates human conversation using Natural Language Processing (NLP) and machine learning techniques. These chatbots can understand user queries, analyze the intent behind the message, and provide appropriate responses in real time. By integrating chatbots into e-commerce platforms, businesses can ensure that customers receive immediate assistance without waiting for human intervention. This improves customer satisfaction and enhances the overall shopping experience.

The proposed AI Chatbot for E-Commerce Support is developed using the Flask web framework in Python and integrates a trained chatbot model to process user queries. The system uses NLP preprocessing techniques such as tokenization and bag-of-words representation to convert user input into a machine-understandable format. The trained model predicts the intent of the user's message and retrieves a suitable response from a predefined dataset of intents stored in a JSON file.

In addition to the chatbot functionality, the system includes user authentication features such as registration and login, implemented using a SQLite database. This allows users to securely access the platform, interact with the chatbot, and manage their profiles through a structured dashboard interface. Session management is implemented to ensure secure access control and maintain user activity during interactions.

Overall, the system aims to provide an intelligent, scalable, and user-friendly customer support solution for e-commerce platforms. By automating responses to frequently asked questions and providing instant assistance, the chatbot helps reduce the workload on human support teams while improving service efficiency and customer engagement.

II. LITERATURE SURVEY

1. Title: Chatbots in Customer Service: Applications and Challenges
Author: Adam Miner, Arnold Milstein, and Jeff Hancock
Abstract:
This study explores the application of chatbot technologies in customer service systems and analyzes their effectiveness in handling user queries. The authors discuss how conversational agents use Natural Language Processing (NLP) and machine learning techniques to simulate human-like communication. The research highlights the advantages of chatbots in providing quick responses, reducing workload for human agents, and improving customer engagement. It also addresses the challenges related to understanding complex user inputs and maintaining conversational accuracy. The study concludes that chatbot systems can significantly improve service efficiency when properly integrated with intelligent algorithms.

2. Title: A Survey of Chatbot Systems through a Loebner Prize Competition
Author: Robert Epstein
Abstract:

This paper presents an analysis of chatbot systems developed for the Loebner Prize competition, which evaluates conversational agents based on their ability to simulate human conversation. The study reviews several chatbot architectures and discusses the techniques used to process and respond to natural language queries. It highlights the importance of knowledge bases, pattern matching, and artificial intelligence in chatbot design. The research emphasizes that modern chatbot systems require advanced learning mechanisms to improve response quality and adaptability.

3. Title: Neural Network-Based Chatbots for Customer Support

Author: Iulian Vasile Popescu

Abstract:

This research focuses on the development of neural network-based chatbot systems designed to provide automated customer support. The study explains how machine learning models can classify user queries into predefined categories and generate relevant responses. The chatbot system uses training datasets and NLP techniques such as tokenization and word vectorization to interpret user messages. The results demonstrate that machine learning–based chatbots can significantly reduce response time and improve service efficiency in online platforms.

4. Title: Conversational Artificial Intelligence for E-Commerce Applications

Author: Daniel Jurafsky and James H. Martin

Abstract:

This research examines the role of conversational artificial intelligence in modern e-commerce systems. The authors discuss how chatbots and virtual assistants help customers interact with online platforms through natural language interfaces. The paper explains the use of NLP techniques, intent classification, and response generation to create effective conversational agents. The study highlights that AI chatbots can enhance user engagement, improve shopping experiences, and automate common support tasks in e-commerce environments.

5. Title: Intelligent Chatbots for Customer Service Automation

Author: Ashish Sharma and Amit Kumar

Abstract:

This study proposes an intelligent chatbot framework designed to automate customer service interactions. The chatbot uses machine learning algorithms to analyze user input and provide context-aware responses. The system integrates a database-driven knowledge base and NLP processing modules to understand user queries. Experimental results show that chatbot-based customer support systems can reduce operational costs while improving the speed and accuracy of responses. The research suggests that chatbots will play a major role in the future of digital customer service systems.

III. EXISTING SYSTEM

In the existing e-commerce customer support system, most platforms rely on manual customer service handled by human support agents through emails, phone calls, or live chat services. Customers who need assistance regarding product details, order tracking, payment issues, return policies, or general inquiries must contact customer support and wait for a response from a representative. Although some websites provide Frequently Asked Questions (FAQ) sections, these are static and cannot dynamically understand or respond to specific user queries. As the number of customers increases, handling a large volume of repetitive queries becomes difficult for support teams.

This often leads to delays in response time and reduced efficiency in customer service operations.

IV. PROPOSED SYSTEM

The proposed system introduces an AI Chatbot for E-Commerce Support that automates customer interaction using Artificial Intelligence and Natural Language Processing (NLP) techniques. The system is developed using the Flask web framework in Python and integrates a trained chatbot model capable of understanding user queries and generating appropriate responses. User messages are processed using preprocessing techniques such as tokenization and bag-of-words, which convert text input into a format suitable for machine learning prediction. The trained model then identifies the intent of the user query and retrieves the most relevant response from a predefined intent dataset.

The system also includes user registration, login authentication, session management, and profile management using an SQLite database. Once logged in, users can access a dashboard and communicate with the chatbot through a chat interface. The chatbot provides instant responses to common e-commerce queries such as product information, order assistance, and general support. This automated approach improves efficiency, reduces the workload on customer support teams, and enhances the overall customer experience.

V. SYSTEM ARCHITECTURE

The Chatbot System Architecture illustrates how different components work together to process user messages and generate intelligent responses. The system follows a modular structure consisting of communication interfaces, processing servers, data storage components, and artificial intelligence modules that collectively enable the chatbot to function efficiently.

At the user interaction level, the system connects with external communication platforms such as Facebook Messenger. Users send their queries through this interface, which acts as the entry point to the chatbot system. The message is forwarded to the API Gateway, which serves as the central access point for all incoming requests. The API Gateway manages authentication, request routing, and communication between external platforms and internal chatbot services. It ensures that user messages are properly directed to the appropriate backend services.

The Chatbot Server is the core component responsible for processing user queries. Once the API Gateway forwards a request, the chatbot server handles the conversation logic and coordinates with other modules to generate a response. It processes the input message, communicates with the NLP engine, and integrates responses from various services. Multiple chatbot server instances can run simultaneously to improve scalability and handle large numbers of user requests efficiently.

Finally, the Administrator Dashboard provides a management interface for system administrators. Through this dashboard, administrators can monitor chatbot performance, review conversation logs, update chatbot responses, and manage system settings. This allows continuous improvement and maintenance of the chatbot system.

Overall, the architecture demonstrates how user communication channels, server infrastructure, NLP processing, data storage, and administrative tools are integrated to create a scalable and efficient chatbot system capable of providing automated support services.

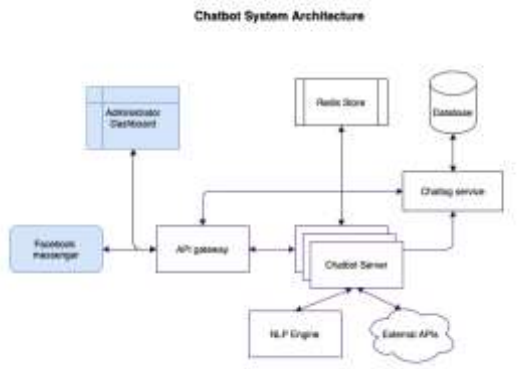


Fig 5.1: System Architecture

VI. IMPLEMENTATION



Fig 6.1: Home Page



Fig 6.2: Ai Shopping Assistant



Fig 6.3: User Profile



Fig 6.4: Project Overview

VII. CONCLUSION

The AI Chatbot for E-Commerce Support system provides an efficient solution for automating customer service in online shopping platforms. The system integrates Artificial Intelligence, Natural Language Processing, and a web-based framework using Flask to create an interactive chatbot capable of understanding and responding to user queries. By applying NLP techniques such as tokenization and bag-of-words, the chatbot converts user input into a structured format that can be analyzed by the trained machine learning model to identify the user's intent.

The developed system also includes user authentication, session management, and database storage using SQLite, ensuring secure user access and data management. Through the chatbot interface, users can easily interact with the system and receive instant responses to their queries. This significantly reduces response time compared to traditional customer support methods.

Overall, the proposed system demonstrates how AI-based chatbot technology can improve customer service efficiency, reduce operational costs, and provide continuous support to users. The system is scalable and can be further enhanced by integrating more advanced machine learning models and expanding the knowledge base to handle a wider range of customer queries in e-commerce applications.

VIII. FUTURE SCOPE

The AI Chatbot for E-Commerce Support system can be further enhanced by integrating more advanced technologies and expanding its capabilities to improve performance and user experience. In the future, the chatbot can be upgraded with more sophisticated Natural Language Processing and deep learning models that allow it to understand complex user queries and provide more accurate and context-aware responses. This would enable the chatbot to handle a wider range of customer interactions beyond simple predefined intents.

The system can also be integrated with real-time e-commerce services such as product recommendation systems, order tracking, payment support, and inventory management. By connecting the chatbot with external APIs and online databases, users could receive detailed product information, personalized shopping suggestions, and updates on their orders directly through the chatbot interface.

Another possible enhancement is the addition of voice-based interaction using speech recognition and text-to-speech technologies. This would allow users to communicate with the chatbot through voice commands, making the system more accessible and user-friendly. The chatbot could also be deployed on multiple platforms such as mobile applications, social media platforms, and messaging services to provide wider accessibility.

Furthermore, the system can incorporate analytics and learning capabilities to continuously improve chatbot performance. By analyzing conversation logs and user feedback, the chatbot can learn from previous interactions and enhance its response accuracy over time. These improvements will make the chatbot more intelligent, scalable, and capable of providing highly personalized customer support in future e-commerce environments.

IX. REFERENCES

[1] TA. M. Turing, “Computing Machinery and Intelligence,” Mind, vol. 59, no. 236, pp. 433–460, 1950.

[2] D. Jurafsky and J. H. Martin, Speech and Language Processing, 3rd ed., Pearson Education, 2021.

[3] A. Shawar and E. Atwell, “Chatbots: Are they really useful?” Journal for Language Technology and Computational Linguistics, vol. 22, no. 1, pp. 29–49, 2007.

[4] J. Weizenbaum, “ELIZA—A Computer Program for the Study of Natural Language Communication Between Man and Machine,” Communications of the ACM, vol. 9, no. 1, pp. 36–45, 1966.

[5] T. Mikolov, K. Chen, G. Corrado, and J. Dean, “Efficient Estimation of Word Representations in Vector Space,” Proceedings of the International Conference on Learning Representations (ICLR), 2013.

[6] S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 4th ed., Pearson, 2020.

[7] I. Goodfellow, Y. Bengio, and A. Courville, Deep Learning, MIT Press, 2016.

[8] G. Hinton, L. Deng, D. Yu, et al., “Deep Neural Networks for Acoustic Modeling in Speech Recognition,” IEEE Signal Processing Magazine, vol. 29, no. 6, pp. 82–97, 2012.

[9] T. Chen and C. Guestrin, “XGBoost: A Scalable Tree Boosting System,” Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, pp. 785–794, 2016.

[10] P. Jackson and I. Moulinier, Natural Language Processing for Online Applications, John Benjamins Publishing Company, 2007.