MULTIDISCIPLINARY RESEARCH INSTITUTE INDIA

Multidisciplinary Journal of Research in Engineering and Technology

ISSN: 2348-6953

Volume 13 Issue 02 (2026) | Pages: 456-461

A Result Paper On AICART- An Intelligent AI Powered E-Commerce Web Application

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Peer Review Information

***Type**: Article*
***Received**: 22 March 2026*
***Revised**: 06 April 2026*
***Accepted**: 24 May 2026*
***Published**: 05 June 2026*

Abstract

AICART is an intelligent AI-powered e-commerce web application designed to enhance user experience through personalized product recommendations, smart search, and automated customer assistance. The system integrates machine learning algorithms and large language models to analyze user behavior, preferences, and purchase patterns. It provides features such as recommendation systems, chatbot assistance, and dynamic pricing insights. The platform is built using modern web technologies and deployed as a scalable application. This project demonstrates how artificial intelligence can significantly improve online shopping efficiency, customer satisfaction, and business decision-making

Keywords: AICART; Artificial Intelligence; Machine Learning; Recommendation Systems; Natural Language Processing; Chatbots; Semantic Search; Personalization; Intelligent E-Commerce.

How to Cite This Article

Nalawade, V. S., Shinde, J., Shirkande, C., Dorale, S., & Gore, P. (2026). A result paper on AICART: An intelligent AI-powered e-commerce web application. *Multidisciplinary Journal of Research in Engineering and Technology*, 13(2), 456–461.

Introduction

E-commerce has rapidly evolved with increasing user expectations for personalized and efficient shopping experiences. Traditional systems rely on static product listings and basic filtering, which often fail to engage users effectively.[1]

AICART addresses these challenges by integrating artificial intelligence into the e-commerce ecosystem. The system leverages recommendation engines, NLP-based chatbots, and user behavior analytics to deliver personalized product suggestions and improve interaction.[2]

The rapid growth of the internet and digital technologies has significantly transformed the way businesses operate, especially in the field of e-commerce. Online shopping platforms have become an essential part of modern life, offering convenience, accessibility, and a wide range of product choices to users worldwide. However, despite these advancements, many traditional e-commerce systems still rely on static interfaces, basic filtering options, and keyword-based searches, which often fail to deliver a personalized and efficient shopping experience. In today's competitive market, users expect more than just product listings—they demand intelligent systems that understand their preferences, predict their needs, and provide relevant suggestions in real time. This has led to the increasing adoption of artificial intelligence (AI) technologies in e-commerce platforms. AI enables systems to analyze large volumes of user data, identify[3]

AICART is designed as an intelligent AI-powered e-commerce web application that addresses the limitations of traditional platforms by integrating advanced machine learning techniques and natural language processing capabilities. The system focuses on delivering a personalized shopping experience by utilizing recommendation algorithms that suggest products based on user preferences, browsing history, and purchase patterns. Unlike conventional systems, AICART dynamically adapts to user behavior, ensuring that recommendations become more accurate over time.[4]

Literature Survey

The evolution of e-commerce systems has been significantly influenced by advancements in data analytics, machine learning, and artificial intelligence. Early e-commerce platforms relied on keyword-based search and manual categorization, which limited personalization and user experience. As online platforms expanded, the need for intelligent systems capable of understanding user behavior became essential.

Smith et al. (2023) proposed AI-driven recommendation models that improve product suggestions using user behavior analysis [1]. Their approach enhanced recommendation accuracy but required large datasets for effective performance. Similarly, Singh et al. (2020) presented hybrid recommendation algorithms that combine collaborative and content-based filtering techniques, improving accuracy and reducing limitations such as data sparsity [11].

Banerjee and Kulkarni (2022) explored deep learning approaches for personalized product recommendations [15]. Their study demonstrated that neural networks such as DNNs, CNNs, and RNNs can capture complex user patterns and provide more accurate predictions compared to traditional methods. However, these models require high computational resources.

Chen and Li (2019) discussed cloud-based deployment and orchestration for scalable e-commerce platforms [14], highlighting the importance of cloud infrastructure in handling large-scale user data. Lee et al. (2020) further emphasized the use of MERN stack for building scalable and efficient web applications [9].

In the area of security and transactions, Gupta and Rao (2022) studied secure payment processing using Razorpay [3], while Rao and Mehta (2019) explored blockchain-based secure transaction systems [12]. These studies highlight the importance of secure and reliable payment mechanisms in e-commerce platforms.

Kumar et al. (2021) analyzed authentication mechanisms in Firebase-based applications [5], suggesting secure login systems for modern web applications. Patel and Sinha (2021) further improved authentication using multi-factor biometric systems [16], enhancing user security.

Recent research has also focused on user data analysis and fraud detection. Chavan and Deshmukh (2024) proposed machine learning techniques for detecting fraudulent transactions in online payment systems [19]. Kaur and Sharma (2020) discussed challenges related to data privacy and security in cloud-based e-commerce systems [18].

Additionally, Wang et al. (2023) explored reinforcement learning techniques for decision-making systems [17], which can be applied in personalized recommendations and pricing strategies. Sharma and Patel (2021) highlighted the importance of real-time inventory management using NoSQL databases [8].

Despite these advancements, challenges such as data privacy, scalability, and high computational requirements remain significant. Existing systems often lack integration of multiple intelligent features into a single platform.

The proposed AICART system addresses these limitations by integrating recommendation systems, NLP-based chatbots, intelligent search

mechanisms, and secure transaction processing into a unified platform. This approach aims to provide a more personalized, efficient, and user-friendly e-commerce experience.

Proposed System

Problem Statement

In the current digital marketplace, traditional e-commerce platforms are unable to deliver intelligent, personalized, and efficient shopping experiences. Users often face difficulty in discovering relevant products due to inefficient search mechanisms and lack of adaptive recommendation systems. Additionally, the absence of real-time customer interaction and intelligent assistance results in poor user engagement and satisfaction. Existing systems also fail to effectively utilize user data for predictive analytics and decision-making. This leads to missed opportunities for improving customer retention and increasing sales. Therefore, there is a need for an intelligent e- commerce system that integrates artificial intelligence techniques to provide personalized recommendations, smart search capabilities, and automated customer support.

System Architecture

Here in this section we have cover the detailed information of proposed system. Here we will see objectives of proposed system along with architecture, hardware and software requirements, applications.

Architecture
Following Figure represents Architecture of our proposed system

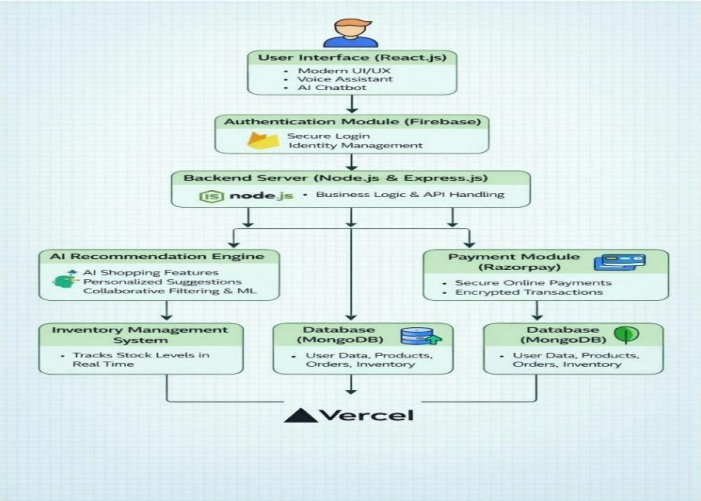

Fig. 1. *Architecture System*

Architecture Description
The AICART system is designed using a multi-tier architecture that ensures scalability, flexibility, and efficient processing of user data. The client layer consists of a user-friendly web interface that allows users to browse products, perform searches, and interact with the system. The application layer acts as the core processing unit and is responsible for handling user requests, executing recommendation algorithms, managing chatbot interactions, and analyzing user behavior. This layer integrates artificial intelligence components such as machine learning models and natural language processing techniques to deliver intelligent functionalities. The data layer stores all essential information, including user profiles, product details, and transaction records, enabling efficient data management and retrieval.

The workflow of the system begins when a user accesses the platform and interacts with it by browsing or searching for products. The system continuously collects user interaction data such as clicks, views, and purchase history. This data is processed by the recommendation engine to generate personalized product suggestions. At the same time, the chatbot provides real-time assistance by understanding user queries and offering relevant responses. Once the user selects a product and completes a transaction, the system updates the user profile and improves future recommendations through continuous learning. This integrated workflow ensures a seamless and intelligent shopping experience.

Work Flow of System

The AICART system follows a simple and efficient workflow to provide a personalized and intelligent shopping experience. First, the user creates an account and securely logs into the platform. After login, the user browses products or searches using keywords or visual

search features. The system collects user interaction data such as clicks, views, and purchase history.

Next, the data is processed and analyzed using machine learning models to understand user preferences. Based on this analysis, the recommendation system suggests relevant products tailored to the user. At the same time, the NLP-based chatbot assists users by answering queries and guiding them through the platform.

When the user selects a product, they can add it to the cart and proceed to checkout. The system provides multiple secure payment options for completing the transaction. Finally, the order is confirmed, and the system updates user data to improve future recommendations and overall user experience.

Result Discussion

Here this section covers the result of implemented project.

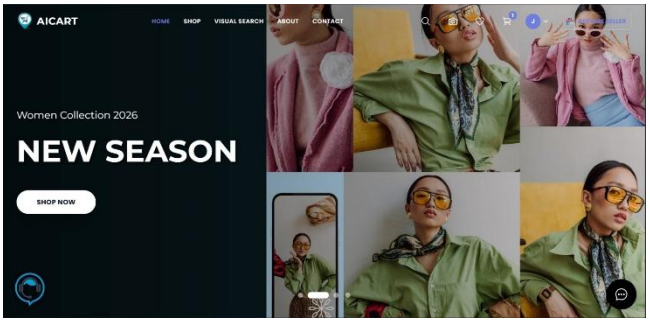

Fig. 2. *Home Page*

The page provides easy navigation options such as Home, Shop, and Visual Search, helping users explore products and enhance their shopping experience.

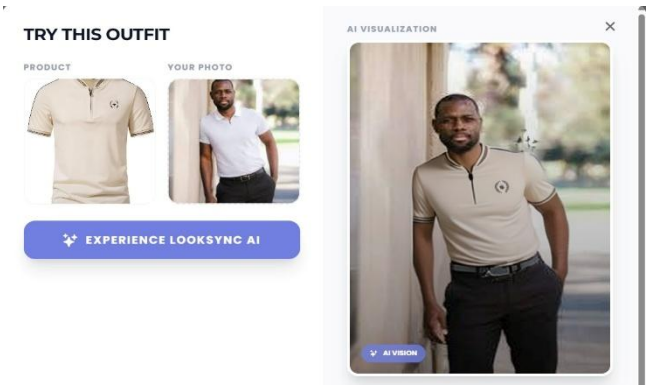

Fig. 3. *Look sync AI Page*

It allows users to visualize outfits by combining product images with user photos using AI. The page enhances user experience by providing a realistic preview of how the selected outfit will look.

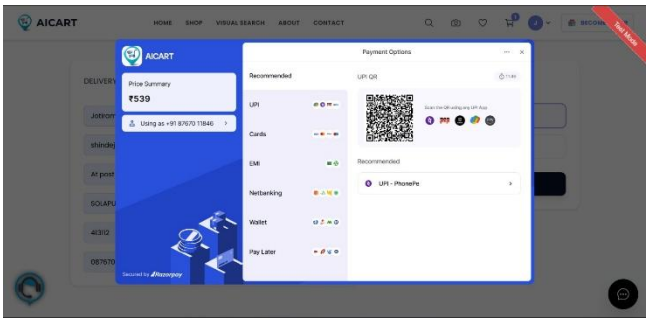

Fig. 4. *Payment Page*

It provides multiple secure payment options such as UPI, cards, net banking, and wallets. The page ensures a smooth and reliable transaction process for users.

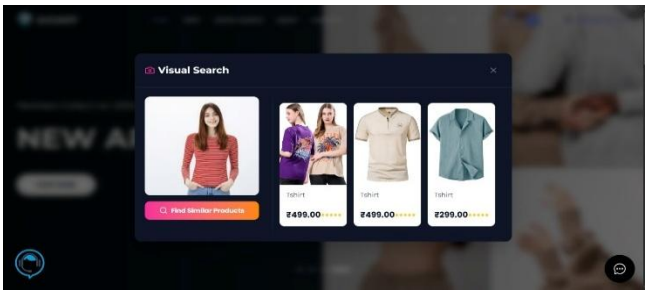

Fig. 5. *Visual Search Page*

It allows users to upload or select an image to find similar products using AI. The page improves product discovery by providing accurate and relevant search results.

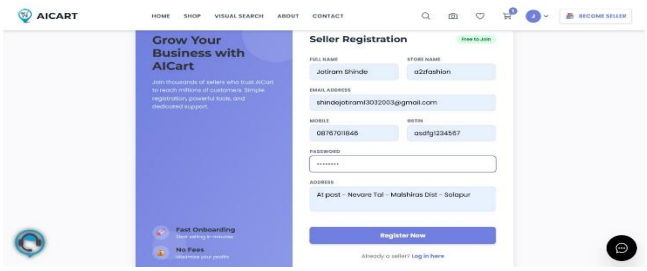

Fig. 6. *Seller Registration Page*

It allows sellers to register by providing necessary details such as name, email, and store information. The page enables easy onboarding for sellers to start listing and managing their products.

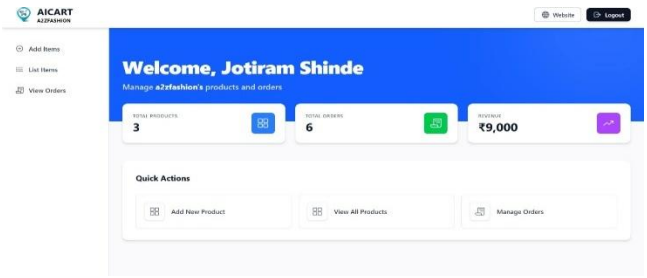

Fig. 7. *Seller Dashboard Page*

It provides an overview of seller activities including total products, orders, and revenue. The page allows sellers to manage products and orders efficiently through quick action options.

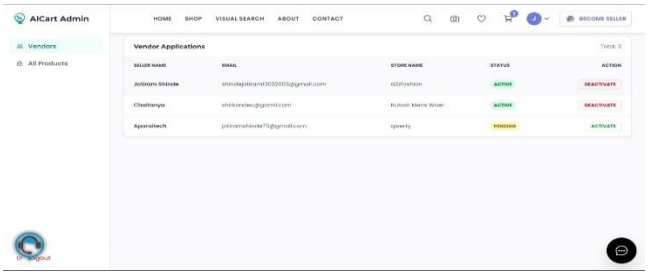

Fig. 8. *Super Admin Page*

It allows the admin to manage vendor applications, view seller details, and control account status. The page helps in monitoring and managing platform activities efficiently.

Conclusion

The AICART system presents an innovative approach to enhancing e-commerce platforms through the integration of artificial intelligence technologies. By combining recommendation systems, natural language processing, and intelligent search mechanisms, the system successfully addresses the limitations of traditional e-commerce platforms. It provides a personalized and efficient shopping experience that

improves user engagement and satisfaction.

The implementation demonstrates that AI-driven solutions can significantly reduce search time, improve product discovery, and enhance customer interaction. Additionally, the ability to analyze user data enables businesses to make informed decisions and optimize their strategies. The system is designed to be scalable and adaptable, making it suitable for real-world applications.

In conclusion, AICART highlights the potential of artificial intelligence in transforming the e commerce industry. Future enhancements may include the integration of advanced deep learning models, voice-based shopping assistants, and real-time personalization techniques. These improvements can further strengthen the system.

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