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AI Shopper

E-Commerce App with AI Voice Assistant

Ms. Mansi Kore (Author)
Computer Engineering
SIES Graduate School of Technology
Nerul, Navi Mumbai, India.

Mr. Sahil Vangari (Author)
Computer Engineering
SIES Graduate School of Technology
Nerul, Navi Mumbai, India.

Mr. Hitesh Reddy (Author)
Computer Engineering
SIES Graduate School of Technology
Nerul, Navi Mumbai, India.

Mr. Ajinkya Patil (Author)
Computer Engineering
SIES Graduate School of Technology
Nerul, Navi Mumbai, India

Mrs. Rizwana Shaikh (Author)
Computer Engineering
SIES Graduate School of Technology
Nerul, Navi Mumbai, India

Abstract: Automatic voice-controlled systems have changed the way humans interact with a computer. Voice or speech recognition systems allow a user to make a hands-free request to the computer, which in turn processes the request and serves the user with appropriate responses. After years of research and developments in machine learning and artificial intelligence, today voice-controlled technologies have become more efficient and are widely applied in many domains to enable and improve human-to-human and human-to-computer interactions. The state-of-the-art e-commerce applications with the help of web technologies offer interactive and user-friendly interfaces. However, there are some instances where people, especially with visual disabilities, are not able to fully experience the serviceability of such applications. A voice-controlled system embedded in a web application can enhance user experience and can provide voice as a means to control the functionality of e-commerce websites. Here we are presenting such system for assisting user for shopping multiple items.

I.INTRODUCTION

1.1 Introduction

Nowadays virtual assistant is very useful to human. It makes human life easier like operate PC's or laptop on only voice command. Virtual assistant is a less time consuming. Virtual assistant is used to run machine like laptop or Pc's on your own command. Virtual assistant is an application program that understands natural language and voice commands to complete tasks for the users. Nowadays virtual assistant is very useful to human. It makes human life easier like operate PC's or laptop on only voice command. Virtual assistant is a less time consuming. Virtual assistant we save our time and contribute in other works. In our project Virtual Assistant is required since it helps the user to browse through his requirements within less time. We have used Flutter and Alan in our App.

1.2 MOTIVATION

In existing system there are only chat bot systems available and not AI Voice assistant features. The Chat bot assistant would only show the steps for the commands that we say and it does not have the feature of adding items to the cart directly through voice command. We have introduced an E-Commerce App which has the feature of AI voice assistant which would take command for the user and do the required search for the user. The rise in the usage of voice-enabled devices in the recent past has clearly shown how comfortable consumers are becoming when it comes to engaging with conversational assistants. We have introduced commands that are similar to the way user might use for searching and many more commands have been introduced. [1] For example: Show items, Add item to the cart by voice commands. [1]

1.3 Problem Statement

E-commerce provides an easy way to sell products to a large customer base. However, there is a lot of competition among multiple e-commerce sites. Many customers nowadays search for their products on Google rather than visiting specific e-commerce sites. They believe that Google will take them to the e-commerce sites that have their product. The purpose of any e-commerce website is to help customers narrow down their broad ideas and enable them to finalize the products.

1.4 OBJECTIVES

- Improve shopping satisfaction with a user-friendly voice assistant.
- To answer questions that users may have.
- To save time and rapidity.
- Customer-centric visual search.
- Boosting the sales by offering AI-driven product recommendations.
- Tailor product suggestions based on user behavior.
- Enable voice search for easy product discovery.
- Provide instant, round-the-clock customer support. [2]

1.5 Organization of the Report

The report is divided in specific sections. The abstract of the project is mentioned in the beginning of the report. We have also included the abbreviations used in the report. Coming to the further three sections, the first section contains introduction of the project, motivation to choose this topic, problem statement and objectives. The next section consists survey of the existing systems in a tabular form. We have also included the limitations of the existing systems. Contribution of each member in our team is mentioned. Further section gives details regarding our proposed system which includes framework of the project along with algorithm followed. Flowcharts are also added for better understanding. Software details and results of projects are displayed. The report is concluded with future work. Lastly, we have mentioned few references regarding our topic.

II. LITERATURE SURVEY

2.1 Survey of Existing System (Table No.1)

Sr No.	Author	Description
1	Mathew P. Aylett (2017)	Web design has evolved from static hypertext publishing in the early days to dynamic multimedia, Web database application servers. New business models that bring savings, revenues, and customer relationships are being incorporated into commercial Web site design. Two generic Web site design strategies; informational/communicational strategy and online/transactional strategy.
2	Cooper, (2015)	Model of Internet Commerce Adoption (MICA) proposes that in developing commercial Web sites, organizations typically start simply by establishing a 'presence' on the Web and build on functionality over time as the level of technical skill/expertise in the use of Internet technologies increases. In addition, as Web sites build on complexity, so will the number of the modules incorporated into the site increase. MICA was developed to explain how business's Web sites develop to incorporate aspects of Internet Commerce.

3	Li Deng, (2013)	Automatic Speech Recognition (ASR) has historically been a driving force behind many machine learning (ML) techniques, including the ubiquitously used hidden Markov model, discriminative learning, structured sequence learning, Bayesian learning, and adaptive learning.
4	Davidson, (2010)	The development of this framework is part of a larger project that aims to survey a large sample of Australian wine industry Web sites. A search of the literature has uncovered three main ways of classifying Web sites. The first classification schemes are called Web typology, or more commonly electronic or digital business models.
5	Boon,Hewett (2009)	To examine the use of the Internet, a survey of 222 local government Web sites located on the Australian Local Government Associations (ALGA) Web page was undertaken. The full scaled local government Web site evaluation revealed that the MICA was too simplistic, especially in stage 2 (Consolidation). Stage 2 of MICA incorporating additional functionality such as technical information, FAQs, Email, on-line inquiry, value-added links and value-added information.

2.2 Limitation Existing system or research gap

Voice commerce allows customers to purchase products or services through a voice-enabled smart device, such as Google Home or Amazon Echo. Using this technology, ecommerce businesses can provide their customers with a unique purchasing experience. [3]

Advantages of voice commerce for business:

- Purchasing convenience
- Review convenience
- Customer data
- Efficiency
- Data Insights
- Accessibility
- Opportunities for growth

Disadvantages of voice commerce for business:

- Lack of visuals
- Limited Product Information
- Privacy and security concerns
- Pre-existing connection is required
- Specific items for specific queries
- Market Saturation

III. Proposed System

3.1 Introduction

In an era defined by technological innovation, the convergence of e-commerce and artificial intelligence (AI) is poised to revolutionize the way we shop and interact with online stores. Our suggested system, an E-Commerce App supported by a cutting-edge AI Voice Assistant, is an ambitious foray into this fascinating field. The goal of this combination of e-commerce and AI-driven intelligence is to completely redefine the online shopping experience. [4]

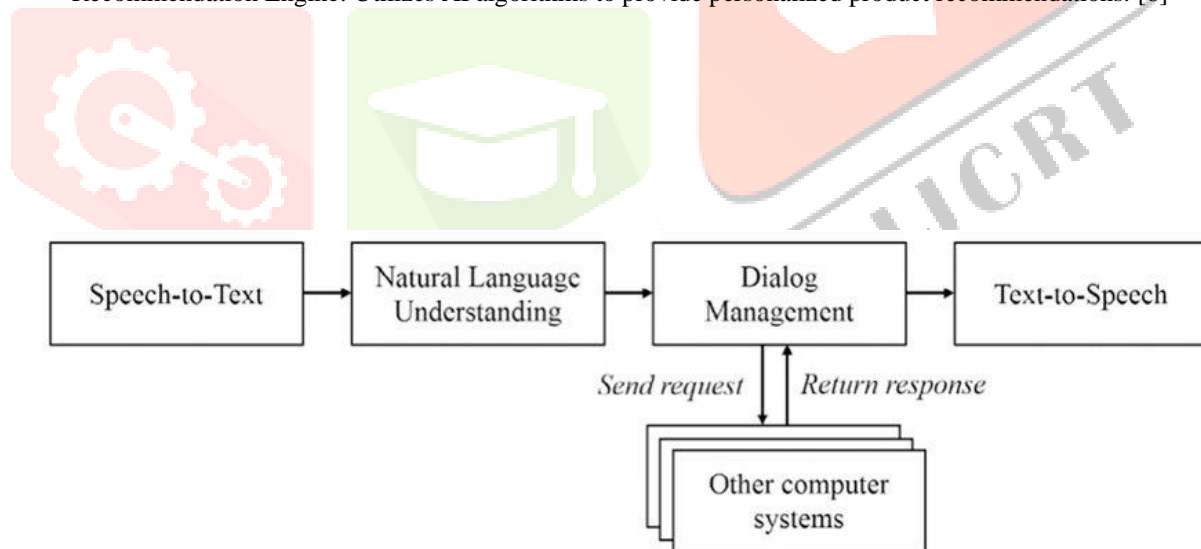
Key Features and Functionalities: voice-activated shopping, data security, personalized recommendation, voice research optimization, 24/7 customer support, seamless integration. Benefits for customers: Accessibility, Convenience, Personalization. Benefits for Business: Competitive edge, cost efficiency, increased sales.

In summary, our suggested E-Commerce App with AI Voice Assistant would be a revolutionary step forward for online buying. We seek to provide users with a more engaging, effective, and customized shopping experience while opening up growth and cost-efficiency options for businesses. To do this, we strive to target common pain points and make use of the power of AI-driven speech technology. We hope to take the lead in redefining the future of e-commerce with the incorporation of this cutting-edge system.

3.2 ARCHITECTURE/ FRAMEWORK

Flutter is Google's portable UI toolkit for crafting beautiful, natively compiled applications for mobile, web, and desktop from a single codebase. [5]

- **Dart Language**
Flutter apps are written in the Dart language and make use of many of the language's more advanced features.
- **Foundation library**
The Foundation library, written in Dart, provides basic classes and functions that are used to construct applications using Flutter, such as APIs to communicate with the engine.
- **Design-specific widgets**
The Flutter framework contains two sets of widgets that conform to specific design languages: Material Design widgets implement Google's design language of the same name, and Cupertino widgets implement Apple's iOS Human interface guidelines.
- **User Interface (UI)**
Mobile app Interface: The front-end of the e-commerce application where customers can explore products, put things in their shopping carts, and initiate voice requests.
Voice Assistant Interface: A voice-enabled interface that allows users to interact with the AI voice assistant.
- **Cloud Services**
Cloud hosting, Data Storage, Machine learning and AI services
- **AI Voice Assistant**
Voice Recognition Model: Trained machine learning models for ASR.
Natural language understanding (NLU): Models for understanding user intent and context.
- **Backend Services**
User Data Management: Manages user profiles, preferences, and purchase history.
Notifications and Alerts: Sends push notifications and alerts based on user preferences.
Recommendation Engine: Utilizes AI algorithms to provide personalized product recommendations. [6]



Basic Flowchart of AI Voice Assistant (Figure 1)

3.3 Algorithm and Process Design

The building of an AI voice assistant for an e-commerce app requires a carefully planned framework. Voice command recognition using ASR is the first step of the procedure, which continues through NLP for user intent analysis. While response generation produces voice or text responses, dialogue management maintains the context of the interaction. User profiles and recommendation algorithms are used to generate customized product recommendations. Algorithms specifically designed for e-commerce are used for order processing, inventory management, and product retrieval. Data encryption and access control are included in security measures, which protect privacy. Enhancing functionality by integration with third-party services, and gathering user feedback through a feedback loop for ongoing development. Scalability and disaster recovery enhance system robustness while integrating multilingual support, accessibility features, and privacy compliance. With the help of AI voice assistant, the comprehensive design guarantees a seamless, secure, and customized shopping experience. [7]

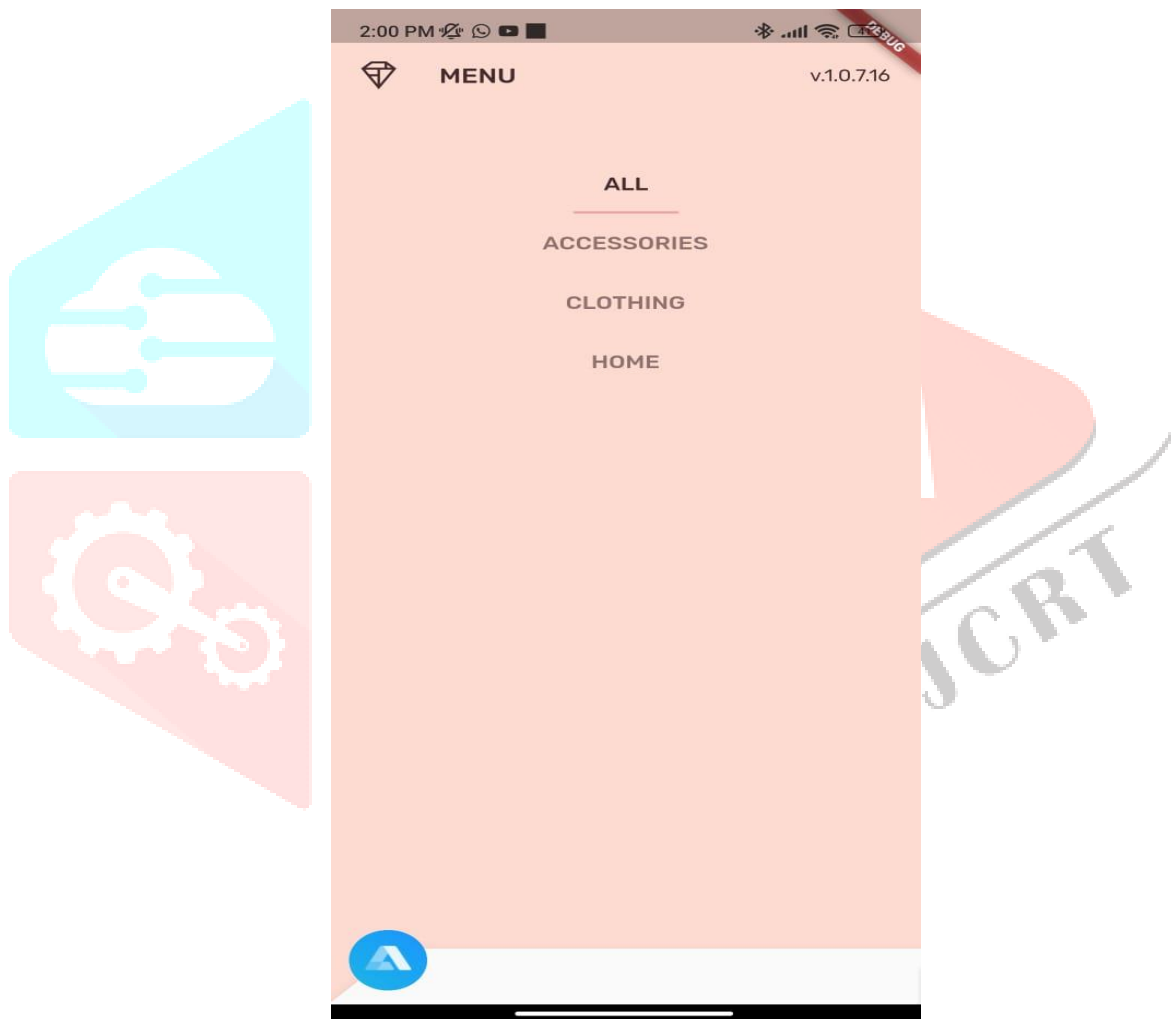


Figure 2

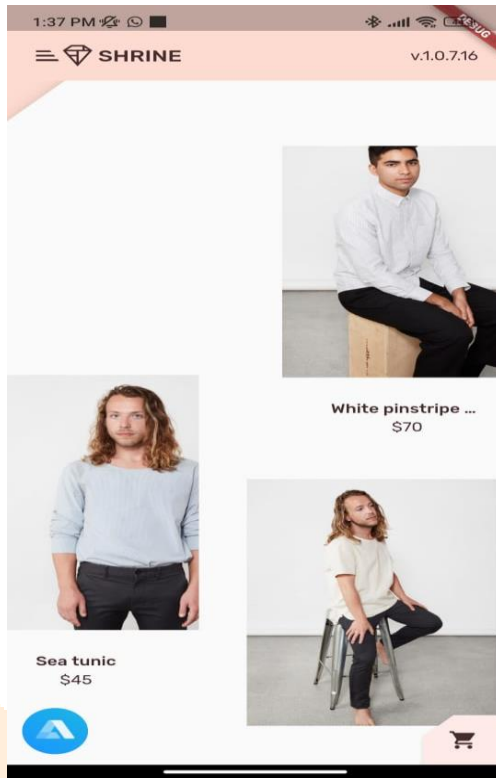


Figure 3

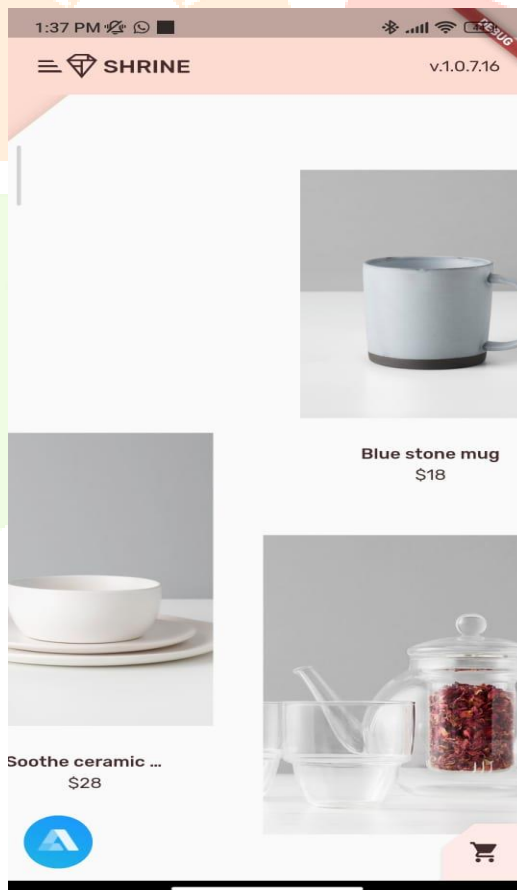


Figure 4

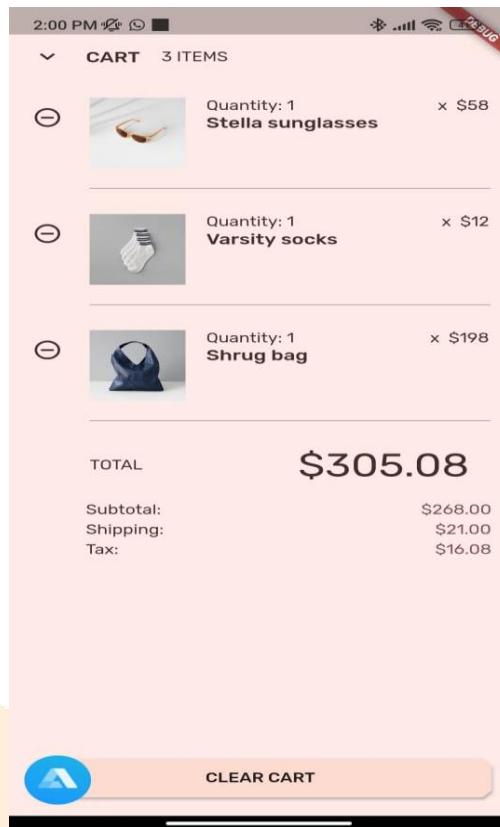


Figure 5

3.4 EXPERIMENT AND RESULTS

Experimentation and results are essential components in the development of an AI voice assistant for an e-commerce app. Rigorous testing is done on the AI Voice Assistant, recommendation algorithms, dialogue management, and security measures during the exploration phase. The AI's ASR accuracy and NLP effectiveness are measured, while the recommendation engine's performance is assessed through user engagement and sales data. Based on user input, dialogue processes are improved, and security audits guarantee data security. The app's scalability and regulatory compliance are continually evaluated.

Analysis of ASR accuracy, user satisfaction, conversion rates, error handling efficiency, accessibility, scalability, and compliance are all part of the results evaluation process. Insights gained from tests and user input enable continuous improvement, allowing the app to adjust to user preferences, technical changes, and market dynamics.

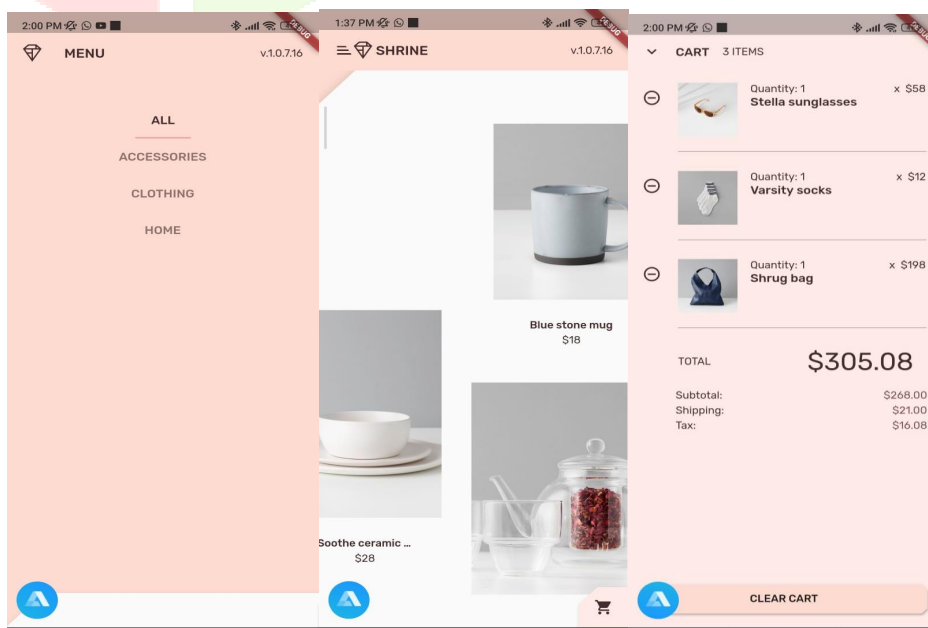


Figure 6

3.5 CONCLUSION AND FUTURE WORK

The development of an E-Commerce App with an AI Voice Assistant represents a significant leap forward in the realm of online shopping, offering users a more engaging and convenient experience. Through the integration of voice technology, natural language processing, and recommendation algorithms, this application streamlines the shopping process, provides personalized product suggestions, and offers round-the-clock customer support. This project on E-Commerce App with AI Voice assistant would help many users to use the voice command technology to buy clothes, accessories etc. AI has emerged as a technology that can differentiate between two competing firms in e-commerce environments. This study presents the state of research of Many technological advancements help e-commerce businesses to meet their customers purchasing needs with speed and convenience. These help customers avail themselves of anything at the click of their mouse. So, if you miss out on these, you will might tend to lose new business opportunities. So, here are the technology trends that you should monitor in the upcoming years. We have thought of including the payment and checkout options that would fulfill the users need and the delivery tracking system as the future scope.

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