Smart AI-Based Food Takeaway Application

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Abstract: This research work proposes a smart food takeaway app that allows users to place orders via voice interaction on a web-based interface. The proposed system aims to enhance accessibility for differently abled users by minimizing reliance on complex visual interfaces and accurate touch interactions while ordering. The proposed app utilizes speech recognition and natural language processing algorithms to interpret user commands, assist users in navigating menu options, and finalize orders using simple voice commands. The proposed system's responsive frontend and modular backend design facilitate safe user registration, restaurant and menu management, order placement, and real-time order status updates. The proposed system simplifies the end-to-end food ordering process and makes it accessible with minimal human intervention, thus improving convenience and independence for visually or motor-impaired users while remaining user-friendly for all customers.

Keywords: *Artificial Intelligence; Food Takeaway; Voice-Based Ordering; Natural Language Processing; Recommendation System; Web Application.*

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I. INTRODUCTION

Smartphones and digital services are changing the way customers order takeaway food from restaurants, but many systems rely on manually entering order details via traditional text-based interfaces; thus, leading to delays and/or errors in the process of ordering food through takeaway systems.

This paper addresses the issues related to the current methods of ordering takeaway food from restaurants and introduces a Smart AI-Based Food Takeaway Application that utilises the advantages of voice interaction (and natural language processing) as well as a recommendation technique to facilitate understanding of user intent and suggest food items. The goals of the system are to automate the ordering process, provide an easy means for customers to order food (via a conversational interface), increase accessibility to customers, decrease the amount of manual effort required of customers, and provide faster and more personalised food ordering from takeaway systems than any previous method.

II. PROPOSED SYSTEM

➢ *System Overview*

The Smart AI-Based Food Takeaway Application is a comprehensive new food ordering system, combining a web interface with an integrated voice interaction module and supporting backend services to create an end-to-end food ordering solution. Users can submit requests via voice or text; the application captures and interprets the intent of the request (e.g., menu items and quantity); and the application will confirm an order and forward it to the restaurant side for processing.

The Smart Food Takeaway Application has a recommendation engine that provides users with suggestions for food items based upon their own user history and the popularity of items with other users. The backend of the application stores user account data, provides user authentication & authorisation, tracks users orders for status, in a secure and scalable way.

➢ *Problem Definition*

Traditional food takeaway applications use an ordering process that requires manual order taking at the counter, ordering via a telephone, or a basic web interface that presents a long menu for the user to browse, and requires the user to enter their details at each ordering occasion. These methods require an inordinate amount of time for the user, experience many errors from either party in delivering the ordered food correctly, and do not provide the user with a way to easily personalize their order using their own preferences or their past ordering habits.

The current food takeaway market has very limited options for supporting the customer's natural means of interaction with the application, and those customers that prefer to operate hands free or have accessibility limitations

find these existing systems to be very inconvenient. This work attempts to solve the problem that currently exists within the takeaway food industry for a truly intelligent, voice capable, recommendatory driven food takeaway application that is capable of understanding user intent with a high degree of accuracy, automating order fulfillment, and providing customers with a better overall experience during their interaction with the food industry.

III. SYSTEM ARCHITECTURE

Web technology and artificial intelligence were combined to develop this solution. The user interface was created using HTML, CSS, and JavaScript on the front end. The backend manages user authentication and authorization, order processing, and database operations.

The system's voice input is captured and converted to text via the Web Speech API, while user command input is processed via natural language processing. In addition, the system utilises machine learning algorithms and models with user behaviour data to create personalized recommendations.

Through this system, users will be able to register, log in, view menu items, order and receive real-time order confirmations.

IV. IMPLEMENTATION

Web technologies were used to build the system as well as artificial intelligence tools. The user interface was created using HTML, CSS and Javascript to create an interactive front-end website. The back-end application is responsible for managing user logins, processing orders and performing all database functions.

Speech recognition will use the Web Speech API to receive voice inputs from users and convert them into text for interpretation. The interpretations of the users will be done using natural language processing. Finally, machine learning algorithms will be used to analyze user data, providing personalized recommendations.

Through this system, users will be able to create accounts, log into accounts, view available menus and place orders, and receive confirmation of their orders in real-time.

V. RESULTS AND DISCUSSION

The system that has been developed allows users to order food through voice commands or typing. The speech recognition module correctly converts speech to text and the natural language processing module correctly interprets what the user wants.

The recommendation system uses the user's preferred foods and order history to provide them with suggestions for what they would like to eat. The system improves access for users, reduces effort by users, and improves the user's overall experience.

This shows that the proposed system is a quicker, more efficient, and smarter method of ordering food compared to existing methods.

VI. CONCLUSION

A Smart AI-Based Food Takeaway Application was introduced through this research. The app uses voice recognition, Natural Language Processing (NLP), and Machine Learning / AI methods to provide an easier way for users to access food takeaway services. The proposed system provides users with more accessibility, decreases manual work required by users, and enhances their overall experience when using the food takeaway application.

The project demonstrated that AI is able to improve or enhance digital services through various forms of AI-based application offerings.

FUTURE WORK

Possibly future enhancements include multilingual speech synthesis, more sophisticated recommendation systems using deep learning, an integrated mobile app, and real-time tracking for delivery via GPS. In addition, improved system performance and scalability can be achieved through cloud hosting and expanded security features.

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