



AUGMENTED REALITY FOOD MENU

¹ Sapna Patel, ² Ayushi Panchal, ³ Vishwa Motawar

¹ Assistant Professor, ² Student, ³ Student

¹ Computer Engineering,

¹ Parul University, Baroda, India

Abstract: This paper explores the potential of Augmented Reality (AR) technology in enhancing customer engagement and accessibility in the food industry. The potential of augmented reality (AR) technology to improve accessibility and customer engagement in the food business is examined in this article. Customers can see meals, get nutritional data, and even place orders straight from their mobile devices with AR food menus, offering them an immersive and interactive experience. The study looks into the advantages of augmented reality (AR) food menus, such as higher customer satisfaction, shorter wait times, and better accessibility for those with impairments. It also covers the difficulties—such as user adoption and technological constraints—of integrating augmented reality technology in the food sector. This research comes to the conclusion that augmented reality food menus present a viable way to boost consumer engagement, increase accessibility, and revolutionize the eating experience based on a thorough analysis of the body of scientific literature and empirical evidence.

Keywords – Laptop, mobile.

I. INTRODUCTION

The implementation of augmented reality (AR) technology in digital food menus has the potential to revolutionize the dining experience in restaurants and enhance customer satisfaction. By displaying 3D representations of dishes, AR can allow customers to visualize the items before placing an order, providing an immersive and engaging way to explore menu items [1]. With AR menus, customers can see every detail of a dish, including texture, portion sizes, and additional information such as ingredients, which can potentially bring dishes to life and make customers more likely to order them [2]. This, in turn, can increase sales in the food industry, as AR technology in digital food menus has been shown to enhance the customer experience and increase sales [2][3][4]. In addition, AR technology can improve food service staff training [2]. The trend of delivering better customer experiences through interactive, relevant content applies to restaurants as well [3]. The 3D menu is an interactive solution that enhances the dining experience by adding a new level of engagement [5]. Implementing AR technology in digital food menus can also provide data about customer preferences through surveys, potentially gathering valuable information for business owners [6]. Furthermore, AR menus offer a more sustainable and environmentally friendly alternative to disposable menus [4]. Thus, it is evident that augmented reality technology in digital food menus has the potential to enhance the customer experience and increase sales in the food industry.

In recent years, the issue of nutrition and its impact on overall health has gained significant attention. Among the many

aspects of nutrition, understanding and accurately determining calorie requirements play a crucial role in maintaining optimal health and well-being[7]. The energy provided by calories is the fuel that drives the body's physiological processes, and an imbalance in caloric intake can lead to a range of health issues, from obesity to malnutrition. As the prevalence of lifestyle-related diseases continues to rise, it becomes imperative to delve into the intricacies of calorie needs and consumption patterns to develop effective strategies for promoting health, preventing diet-related disorders and awareness not to waste food because they consume things that do not meet their calorie and nutritional needs.

II.EXISTING SYSTEM

. The food industry is blooming with time and there is variety of food.Lately the description of menu and ingredient changed as new technology came into working some of them are below:

A. A food ordering system that automates the process and includes food recommendations, personalization, and discounts. The food recommendation will be included with the following features.

- Digital food ordering menu system with easy meal detail updating
- Personalized meal recommendations with accounting for personal preferences and customer historical data.
- Personalized advertising capability.

The suggested system is a software project that employs machine learning technology to deliver two key system functions. As a result, a vast amount of data will be needed to construct the system. These data will be acquired from sources that are openly accessible to the public via the Internet. People working in the relevant fields will be contacted to verify the information. Previous works will be used to build digitized food ordering by adding customization with regard to this research objectives. The application will be a web-based application that is able to access from a large number of devices. This will be helpful for the restaurant not to depend on certain hardware. When it comes to recommending machine learning models, there are a few popular models that can be found. Those models are Collaborative filtering, Content-based filtering, Demographic-based filtering, Knowledge-based filtering, Hybrid-based filtering [14]. Although all of these systems may create suggestions, only three of them are appropriate for the proposed food recommendation system. This system has included collaborative filtering, content-based, and hybrid-based recommendation systems, due to the fact that the proposed system is a user-based, ingredients aware recommendation system [9], [10].

B. Visualizing food in 3D using augmented reality for a better customer experience. The proposed AR system enables customers to view food items in greater detail compared to traditional menus, while also eliminating language barriers. The system will provide the following functionalities,

- Display the customized food menu items.
- Display a prototype of the customer's chosen food order.
- Present information regarding the nutritional value and price of the meals based on the customer's preferences.

The proposed AR system is a QR-based mobile application specifically designed for Android devices, as they are cost effective and widely accessible. The smartphone's camera captures real-time images, which are then processed by the AR application to generate 3D models of the food items and extract relevant information. The Android application consists of several components. The image-capturing module analyzes each frame captured by the camera module, generating binary images [11]. The image-processing module identifies QR codes and utilizes the binary images from the image-capturing module. The marker tracking module continuously tracks the camera's position in real-time. The rendering module blends the original images with virtual components to generate augmented images on the smartphone or tablet screen [12]. This method, based on QR markers, allows customers to visualize 3D models of the actual food items placed in front of them. QR codes for each dish will be generated using an internet QR generator. The tablet or Android phone, equipped with an internet connection and camera, receives a live video feed of the target image as input to process the 3D food models. The AR Development Kit facilitates the placement of 3D objects and overlays virtual elements in the real world using the device's camera. It also updates the database with image targets and tracks QR code properties. Following these processes, an AR Android application is developed, enabling users to scan QR codes and visualize the corresponding 3D food models.

III.PROPOSED SYSTEM

This proposed system has AR with a 3D view of dishes showing how much calorific value consists of the dish.The topic of diet and how it affects general health has received a lot of attention lately. Of the several facets of nutrition, comprehending and precisely Determining one's calorie needs is essential to preserving optimum health and wellbeing. The body uses calories as fuel to power its physiological functions. An imbalance in caloric intake can result in a number of health problems, including starvation and obesity. It is critical to investigate the complexities of calorie needs and consumption patterns in order to develop practical strategies for promoting health, preventing diet-related disorders, and raising awareness of the need to not waste food because one consumes items that do not meet one's nutritional and calorie needs. This is because the prevalence of lifestyle-related diseases is steadily increasing. Unity and C# script to help the code to system.



Figure 1

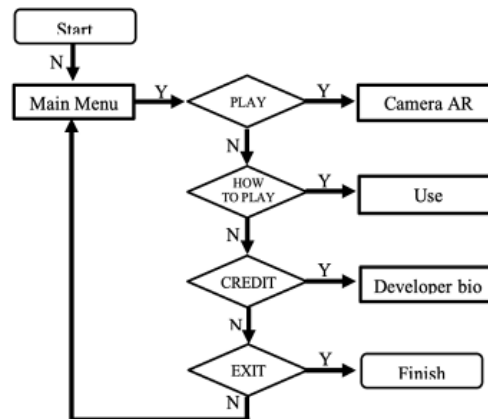


Figure 2 Flowchart

Flowchart consists of the original plan of execution of the AR based food menu system .At first stage it will give the option of food for selection with the help of AR camera and select it. After selecting it will show the calorific value of the dish which will help you to select healthy food.After selection payment it will finish the process.

IV. FUTURE ENHANCEMENT

In future we are thinking of making an interactive food menu system which will have real-time updates on the menu to reflect changes in availability, seasonal specials, or sold-out items. Even nowadays Artificial Intelligence and Machine Learning so machine learning algorithms to analyze customer preferences and order history to provide personalized menu recommendations.

V. CONCLUSION

In summary, there are a lot of interesting opportunities for improving user experiences and staying on the cutting edge of technical improvements in food menu systems in the future. Restaurants may make their patrons' experience more engaging and user-friendly by implementing cutting-edge technologies like interactive visual menus, tailored suggestions, augmented reality integration, and real-time updates. Refinement and optimization of these enhancements will depend on doing usability testing and paying close attention to customer input as the food sector develops. Restaurants that consistently adopt new technology can not only meet but also beyond customer expectations, strengthening the bond between their establishments and their clientele. The combination of innovation, accessibility, and personalization in food menu systems will shape the way we order, explore, and enjoy food in the future.

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