AUGMENTED REALITY E-COMMERCE APPLICATION

[1]Prof. Atiya Kazi, [2]Mr. Rohan Desai, [3]Mr. Manthan Paradhi, [4]Mr. Shashank Khadilkar

[1]Professor, [2]Student, [3]Student, [4]Student
Department of Information Technology
Finolex Academy of Management and Technology, Ratnagiri, India

Abstract: The entire commercial market has transformed as a result of online shopping. Most consumers nowadays tend to shop online rather than going from store to store looking for the perfect deal. E-commerce websites have significantly improved the retail experience. There is a lot that should be done to enhance the e-commerce experience. This paper reflects on the use of virtual reality in conjunction with a smartphone e-commerce application.

Index Terms - **Augmented Reality, E-commerce, Mobile Application.**

I. INTRODUCTION

In computer programming, augmented reality is the method of merging or "augmenting" video or photographic displays by overlaying valuable computer-generated data on top of the images[1]. Smartphone apps have also been created to monitor details such as building addresses, real estate signage, retail sales deals, and restaurant ratings on specific pages as viewed from the device's viewfinder or electronic displays.
Nowadays, online shopping is becoming increasingly mainstream. This paper explores the various possibilities for using Augmented Reality to create an immersive e-commerce experience. We developed an application that would let a user display the 3d model of any product listed on the app.

II. AUGMENTED REALITY

2.1 Definition

Many publications agree that the use of Head-Mounted Displays (HMDs) is required to define AR [5]. To avoid confining AR to specific technology, we propose that AR be defined as systems that meet the following criteria: 1) mixes actual and virtual elements; 2) is interactive in real time; and 3) is 3-dimensionally registered. While keeping the core components of AR, this definition attempts to allow other technologies, such as mobile technology, to be used alongside HMDs [6]. Interactive rates can be achieved with 2-D virtual overlays on top of live video, but the overlays are not coupled with the real world in 3-D [7]. Monitor-based interfaces, monocular systems, see-through HMDs, and mobile devices are all allowed under this criteria. [9]

2.2 History of Augmented Reality

Professor Tom Caudell and David Mizell of Boeing Computer Services in Seattle invented the term "augmented reality" in the early 1990s [4]. Armstrong of the United States Air Force developed the first completely working Augmented Reality system, Virtual Fixtures. In the same year, Feiner et al. launched the Turing Machine, which was the first outdoor AR system. The user had to wear a backpack that had a computer, a tablet for input, and various sensors. Many of the core concepts of augmented reality have been employed in movies and science fiction since at least 1984's The Terminator and RoboCop (1987). These films depict cyborg protagonists whose vision systems provide a constant stream of annotations and graphical overlays that enhance their perceptions of the physical world. AR has become more common as technology has advanced, and smaller devices can now accommodate it. AR is now available to everybody with a smartphone, and it has grown in popularity in recent years. [3]

III. WORKING

The application's initial stage will be identical to that of any other e-commerce site. Amazon, Flipkart, and eBay, for example. When a user chooses a product that he or she likes and uses the augmented reality function, the 3d model for that product is retrieved from the database. The AR system will begin detecting the plane and displaying a marker on the detected plane. Once the model has been retrieved from the database.

The 3d model will be spawned in the location of the marker once the user clicks it. After that, the user could scale or rotate the model to his or her preference. The application uses Google's AR Core and Apple's ARKit to implement these augmented reality features using flutter for e-commerce application development. The workings of the augmented reality is depicted in the block diagram below:
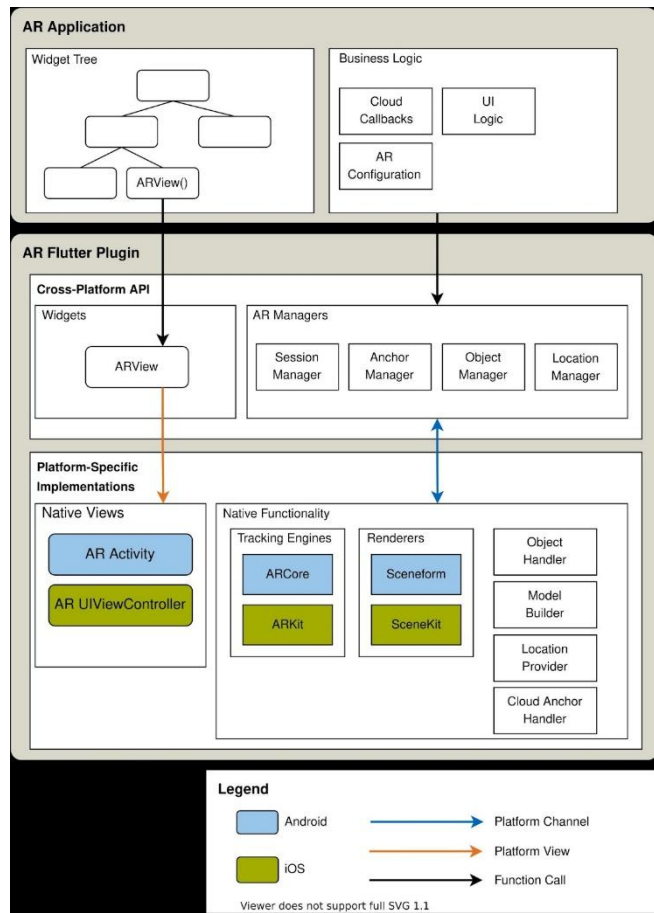

Fig.2. AR system block diagram

Fig.1. Working of flutter Augmented Reality plugin
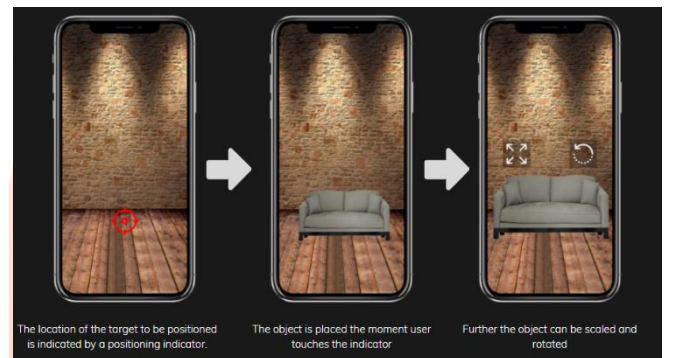
Fig.3. Working of AR feature

IV. IMPLEMENTATION

4.1 Requirements

- Android device with augmented reality compatibility.
- Ample amount of lighting conditions while using augmented reality features.

4.2 Features

- User authentication using email and password
- E-commerce application features e.g. Products view, product description, buy.
- View in augmented reality support.
- Users can rotate and pan the 3d object in real time.

V. RESULTS

The primary purpose of this software is to allow customers to visualize how the products which they want to purchase will appear before purchasing it.
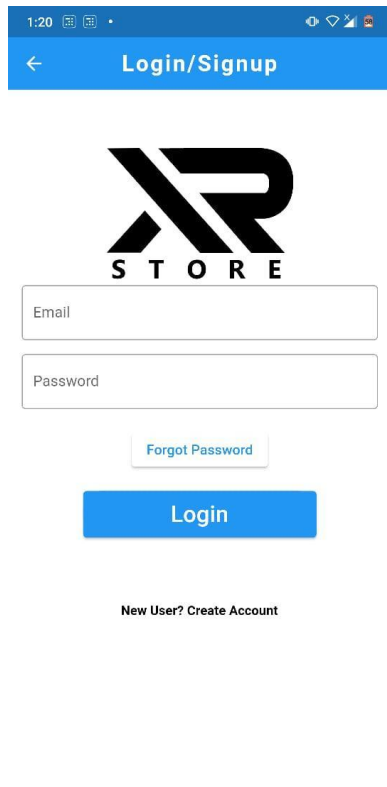

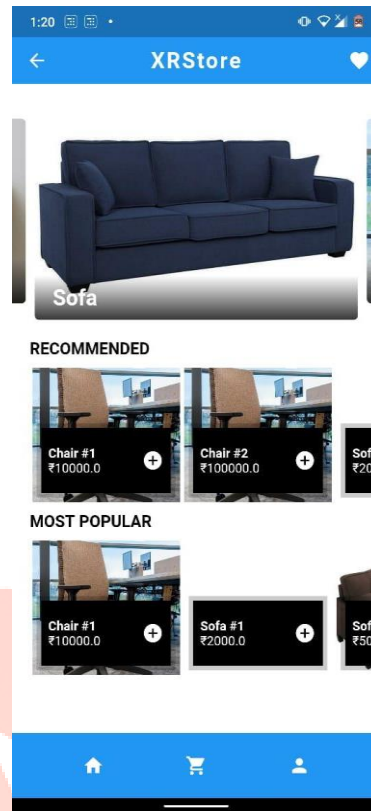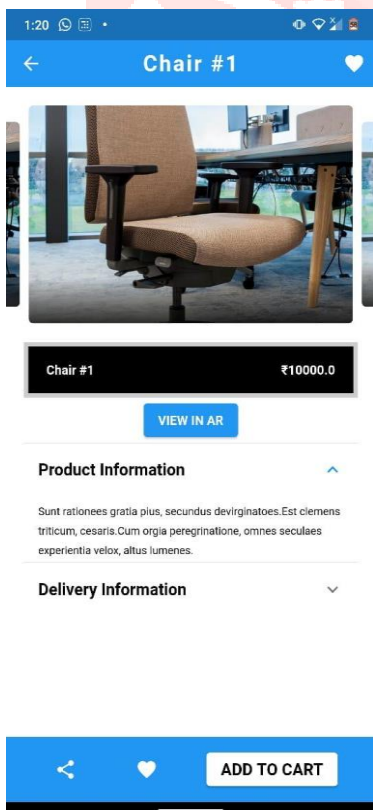
Fig. 4.1. Login Screen

Fig. 4.2. Home Page

Fig. 4.3. Product Description

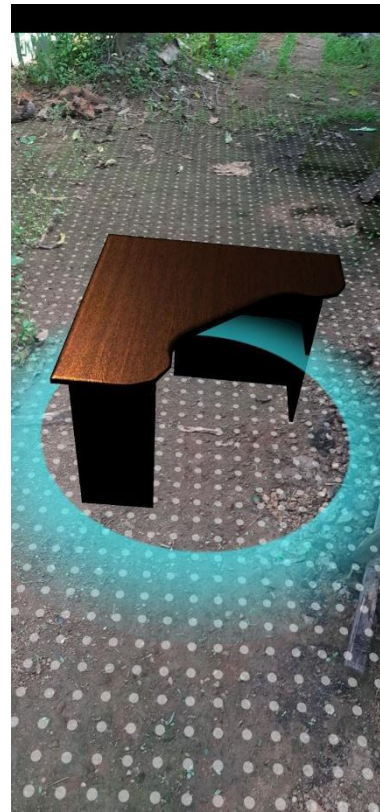Fig.5.1. Augmented Plane Detection
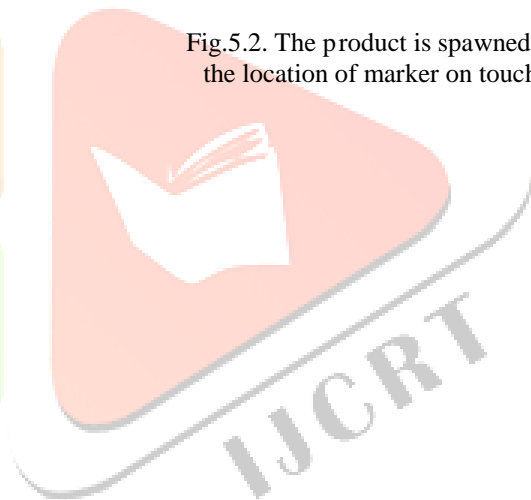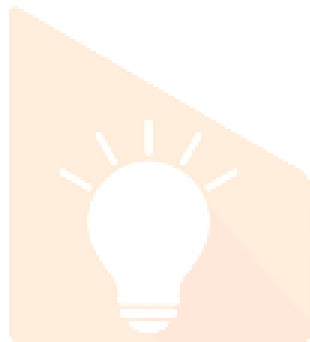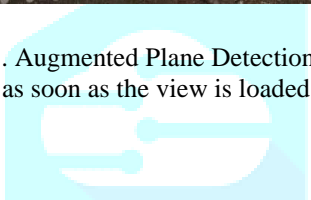starts as soon as the view is loaded

Fig.5.2. The product is spawned at
the location of marker on touch

Fig.5.3. The product can then be rotated
and moved as desired

VI. BENEFITS OF THIS TECHNOLOGY

1. Engage more customers : Brands will be able to engage and interact better with their customers.
2. Makes products more tangible : AR could be used by furniture and home decor companies to show consumers how different items can appear in their houses.
3. Makes shopping more enjoyable: Shoppers will engage with a specific scale of a product in 360 degrees for a more immersive experience.
4. With the use of augmented reality, the likelihood of a buyer returning a product reduces dramatically so they will trial it before purchasing, which benefits the production business.

VII. CONCLUSION AND FUTURE SCOPE

While working on this article, we gained a lot of knowledge about augmented reality and mobile application development.

E-commerce is an essential part of today's business activities, but it lacks a number of critical capabilities. Our efforts ensure that online shopping is both cost-effective and profitable for both businesses and consumers.

Augmented reality technology has a lot of scope of development in the future.

Stable and faster working of the functionality would be seen in the future.

Photorealistic and advanced rendering: Although many AR applications just require basic visuals like wireframe outlines and text labels, the ultimate goal is to make virtual objects indistinguishable from real ones. This must be done in real time, without the need for artists or programmers to intervene manually. In order to complete this task, new image-based rendering strategies must be considered [10].

AR in all senses: The primary focus of research has been on improving visual perception. In the end, appealing AR settings may necessitate the use of other senses as well (touch, hearing, etc.) [8].

VIII. ACKNOWLEDGMENT

REFERENCES

[1] Hosch, William L.. "Augmented reality". Encyclopedia Britannica, 11 Feb. 2021, https://www.britannica.com/technology/augmented-reality. Accessed 29 April 2021.

[2] Arshif Ali, Kishor Saikia, Biki Nayak, Monoj Kr. Muchahari and Pranav Kumar, Augmented Reality Based Online Application For E-Shopping, International Journal of Advanced Research in Engineering and Technology (IJARET), 12(3), 2021, pp. 212-232. http://www.iaeme.com/IJARET/issues.asp?JType=IJARET&VType=12&IType=3.

[3] Chandan, G., Jain, A. and Jain, H., 2018, July. Real time object detection and tracking using Deep Learning and OpenCV. In 2018 International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 1305-1308). IEEE.

[4] Alves C., Luís Reis J. (2020) The Intention to Use E-Commerce Using Augmented Reality - The Case of IKEA Place. In: Rocha Á., Ferrás C., Montenegro Marin C., Medina García V. (eds) Information Technology and Systems. ICITS 2020. Advances in Intelligent Systems and Computing, vol 1137. Springer, Cham. https://doi.org/10.1007/978-3-030-40690-5_12

[5] A. L. Janin, D. W. Mizell, and T. P. Caudell, "Calibration of head-mounted displays for augmented reality applications," in Virtual Reality Annual International Symposium, 1993., 1993 IEEE. IEEE, 1993, pp. 246–255.

[6] R. Azuma, Y. Baillot, R. Behringer, S. Feiner, S. Julier, and B. MacIntyre, "Recent advances in augmented reality," Computer Graphics and Applications, IEEE, vol. 21, no. 6, pp. 34– 47, 2001.

[7] M. de Sa and E. Churchill, "Mobile augmented reality: explor- ´ ing design and prototyping techniques," in Proceedings of the 14th international conference on Human-computer interaction with mobile devices and services. ACM, 2012, pp. 221–230.

[8] Silva, Rodrigo & Oliveira, Jauvane & Giraldi, G.. (2003). Introduction to augmented reality.

[9] Mekni, M. and Lemieux, A., 2014. Augmented reality: Applications, challenges and future trends. *Applied Computational Science*, *20*, pp.205-214.

[10] S. Boivin and A. Gagalowicz. Image based rendering for industrial applications. ERCIM News, 2001.

[11] Alves C., Luís Reis J. (2020) The Intention to Use E-Commerce Using Augmented Reality - The Case of IKEA Place. In: Rocha Á., Ferrás C., Montenegro Marin C., Medina García V. (eds) Information Technology and Systems. ICITS 2020. Advances in Intelligent Systems and Computing, vol 1137. Springer, Cham. https://doi.org/10.1007/978-3-030-40690-5_12