DreamDom - AR based Furniture Application

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Abstract - *The Proposed study focuses on how Augmented Reality can affect E-commerce and thus providing the best solution for the problems faced by the customers while purchasing the products online. The customer will not only be able to buy the product but also try it virtually. Thus, following the try before buy with the help of Augmented Reality will help the users as well as the E-commerce thus assuring the increased sale as well as the competition.*

Keywords - Augmented Reality, AR SDKs, Sceneform SDK, ARCore, 3D models.

1. INTRODUCTION

"DreamDom" will be a perfect implementation of augmented reality. "DreamDom" will have various functionalities like providing a 3D view of different furniture objects around you in the real world. The customer will not only be able to buy the product but also try it virtually. Thus, following the try before buy with the help of Augmented Reality will help the users as well as the E-commerce thus assuring the increased sale as well as the competition.

Fig -1: DreamDom logo

Do you remember the time, when you were buying a chair, a carpet, or anything else? Remember how excited you were about the fortunate purchase, rushing home and finding out that an item did not fit the room and there were only two further options: either return the goods and go back to the start, or leave and live with it. Fortunately, with new technology advances and stuff like AR i.e. Augmented Reality, these times are gone. Selecting colors for the interior, choosing a drawing or a model of a room, staging it with the furniture. Essentially, AR is a technology which enables us to render the computer-generated 3D object models into the real world and have it interact with its surroundings as if it were physically present at the same location. The proposed paper can be called as the furniture retail guide to the users of what the chair would look like in our living room before making a purchase. A few years ago, developing AR applications meant learning OpenGL and complex vector math. In 2018, Google released the ARCore along with the Sceneform SDK for android in order to make AR development easier for everyone. ARCore is a platform for building Android AR experiences. It enables your phone to sense its environment, understand the world and interact with the information. ARCore in itself isn't an SDK, rather it is an engine that helps SDKs to render the objects. Hence, in order to make use of this functionality, Google released Sceneform SDK to enable developers to build Android AR applications.

2. LITERATURE SURVEY

Augmented Reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. Augmented Reality can be implemented using various Software Development Kits (SDK's). The comprehensive study about the use of various SDK's and about Augmented Reality and how it is different from Virtual Reality by Dhiraj Amin and Sharvari Govilkar [1]. The use of Augmented Reality in classrooms, basically studying the opinions of teachers using the marker-based AR application. The Project proposed and studied by Irfan Sural [2] showed that the teacher candidates were very

excited of using augmented reality for the first time in their learning. The idea of Virtual Furniture using this technology as studied by Snehal Mangale, Nabil Phansopkar, Safwaan Mujawar, Neeraj Singh [5] shows that the Augmented Reality in Furniture selling application will eliminate the human efforts by physically visiting the furniture store which is very time consuming activity. The survey conducted by Graeme McLean, Alan Wilson [4] shows that the variables influencing brand engagement through retailers' mobile apps and the consequent outcomes of AR related brand engagement. The research introduces a new set of augmented reality attributes, namely, AR novelty, AR interactivity and AR vividness and establishes their influence on technology acceptance attributes of perceived ease of use, usefulness, enjoyment and subjective norms. The study about Interior Designs using Augmented Reality by Tan Poh Yee [3] proposes that since people are busy with their work, they have no time to go to various stores to buy furniture for their home, shop or office. It is difficult to fulfil the customer's contentment of decorating their room without an imaginary picture to refer to. Printed furniture catalog is basically a paper based information with lots of texts and images which does not provide any interaction for the user and people can't view a better graphics of visualization because the design layout is statically presented on papers. So, AR and 3D technology must be applied into the interior design areas. It is an application which includes furniture and furnishings will develop in three-dimensional surfaces of objects and present by using augmented reality.

3. IMPLEMENTATION

The ultimate goal of using E-commerce and Augmented Reality in our proposed system is to create it in such a way that the customer can get all the furniture stuff under one application and also he can use AR for visually trying out products at his home or at any location required and choose the perfect item that fits the best and meets all his expectations.
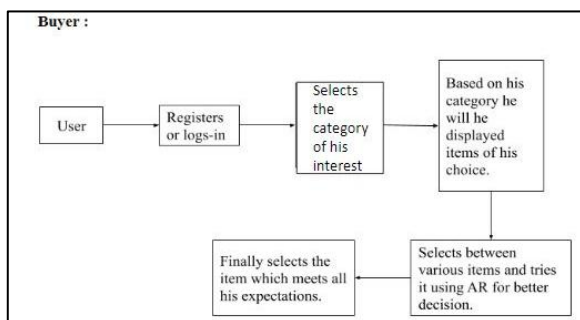
Fig -2: Block Diagram

ARCore: ARCore works on 3 principles -
a. Motion Tracking: It allows the phone to understand its current position relative to the real world.

b. Understanding the Environment: It allows the phone to detect the size and location of all the types of surfaces such as vertical, horizontal and angles.
c. Light Estimation: It allows the phone to sense the environment's lighting condition. As the user moves his/her phone in the real world, ARCore is able to understand its surroundings and emulate the real world digitally, in which it can place objects. Motion tracking helps ARCore to identify features which allows it to keep a track of its location in relation to the real environment. As of now, ARCore is available for Java (Android), Unity (iOS and Android), Unreal Engine, iOS. Here, we will be using Java and Android Studio.

Sceneform: Sceneform comes with features such as –

a. An automatic compatibility check for ARCore enabled phones.
b. Checking for camera permissions.
c. A scene graph API to abstract all the complexities.
d. A plugin for manipulating assets.

Step [1]: Setting up with the Sceneform plugin and adding dependencies in the Android studio gradle.
Step [2]: Checking the compatibility at runtime.
Step [3]: Adding 3D models.
Step [4]: Importing the model while converting it to .sfa and .sfb formats from .obj type with the help of Sceneform plugin.
Step [5]: Building the model.
Step [6]: Adding the model to the AR Scene.

4. CONCLUSION

This system will help and assist the customer to view the furniture object virtually in real environment before buying the object. Due to these systems, customers will come to know how their home structure would look after purchasing and placing the furniture object. This proposed system would let the user try on multiple combinations of objects virtually without physically moving the furniture objects. These will help the buyer in determining how to set up the furniture in their home structure. Research suggests that 61% of customers like the idea of being able to try different options before committing to a decision. 30% would also use AR to get opinions on purchases, such as making posts via social media. Soon, the major retailers will be seen enhancing their mobile applications by adding augmented reality features.

5. FUTURE SCOPE

In future, our project dataset and scope will be scalable. The user might be able to completely redecorate his house or even plan interior designing of the house with this application. The user might also try out all the house items

like kitchen items, appliances, etc. He might also be able to try different wall colours virtually before actually getting his wall painted. The application will prove an all-in-one stop for all the house related facilities.

6. REFERENCES

[1] Dhiraj Amin and Sharvari Govilkar, "Comparative study of Augmented Reality SDKs", Pillai College of Engineering.

[2] Irfan Sural, "Augmented Reality Experience: Initial perceptions of Higher Education Students", Asst. Prof., Eskisehir Osmangazi University, Faculty of Education, Department of Computer Education and Instructional Technology, Turkey.

[3] Tan Poh Yee, "Interior Design using Augmented Reality" faculty of Computer System and Software Engineering..

[4] Alan Wilson, Graeme, "Shopping in the digital world: Examining customer engagement through Augmented reality

mobile applications" University of Strathclyde, Scotland, United Kingdom.

[5] Neeraj Singh, Safwaan Mujawar, Snehal Mangale, "Virtual Furniture using Augmented Reality", Department of Computer Engineering, RMCET, Mumbai University, India, Department of Information Technology, Engineering, RMCET, Mumbai University, India.