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SET-FURNITAR – ONLINE FURNITURE SHOPPING USING AUGMENTED REALITY

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Abstract : Information and communication technology support the development of human interaction with physical, Network, computer and virtual environment such as science, commercial, banking, education, etc. Buying a furniture online rather than preferring traditional furniture shopping was possible but there was no option to get a AR view of the furniture to check how it would look in our home/house. Now in our proposed system, it is possible for user to buy the furniture by sitting in the house without visiting the shops and getting idea of how that furniture would look like at home. The main purpose of the "**SET-FurnitAR**" is to develop an android application for trying different furniture in virtual way using a mobile which supports AR. The application will eliminate the human efforts by avoiding visit to the furniture store for getting a view of furniture which is time-consuming activity. Besides, that it is easy and more effective to use this technology for Online shopping as an option for user to try out the furniture items in their room they are thinking to purchase and allow customer to visualize the room how it will look after placing furniture in it. User can try multiple combinations virtually, without physical movement of furniture items. Our motivation here is to increase the efficiency, provide customer a virtual AR view of the furniture and improve the accessibility of furniture try on by creating furniture augmented reality application. This system will help the customer to view the furniture object virtually in real environment before buying the furniture. Due to this system customer will come to know how his home interior would look before buying the furniture. This system would let the user to try multiple combination of furniture virtually without any transportation of the furniture. These will help the customer to determine how it looks in Home.

IndexTerms **- Augmented Reality, Furniture Shopping, 3D object, Sceneform.**

INTRODUCTION

Ecommerce technology is everywhere the planet is growing exponentially while on the opposite hand augmented reality has been a trending topic in software development circles for variety of years, Augmented reality may be a technology that works on computer vision-based recognition algorithms to reinforce sound, video, graphics and other sensor-based inputs on world objects using the camera of your device. it's an honest thanks to render world information and present it in an interactive way in order that virtual elements become a part of the important world. Augmented reality displays superimpose information in your field of view and may take you into a replacement world where the important and virtual worlds are tightly coupled. it's not just limited to desktop or mobile devices. there's no growth without evolution, thus the ecommerce industry needs to constantly add new increments of technology to itself if it plans to expand. One such increment is that the use of Augmented Reality to appeal to its customers and new users. So our project mainly focuses on providing a 3D view of the furniture to the user for better user experience. an easy augmented reality use case is: a true world object is first captured, and the underlying platform detects the surface, which then triggers it to feature a virtual object on top of the real-world image and displays on your camera screen.

REQUIREMENT SPECIFICATION

- Software Requirements :

Language : JAVA
Operating system : Window 64bit
Tools : Android Studio, AR Core, Google Firebase, Google Poly.

- Hardware Requirements:

RAM Capacity : 4GB
Memory : 50GB
Network : Active Internet Connection
Graphics Card:1GB
Accessories : Official Google AR Camera support Smart Phone

PROPOSED SYSTEM DESIGN

The basic premises of the proposed system is to overlay digital 3D model on top of real things using a camera. This application will use AR supported mobile phone to scan the living area and display the augmented furniture object to check whther it adjusts or not and that helps in better choosing of the right furniture for our need.Poly Pizza is used for creation 3D model of image. And Sceneform is a plugin which offers rendering of 3D model. Next, the furniture model is selected and the selected model is rendered and processed to be loaded on the scanned surface by google AR Core. Mapping of 3D model into the smartphone screen take place which decides the dimension of the model which is then rendered and displayed onto the screen.

Analysis of the system can be divided into following 3 phases:

- Data / 3D models collection, rendering and display: The application requires a 3D model in .glb/.gfa/.gfb format to be displayed for each product in the menu of the application, rendering the required furniture image object format from sources like Polly pizza, and displaying the 3D view on UI.
- User Interface creation : The user interface of the application consists of several pages Home page, Categories page, products page, product details page & Cart page, AR view.
- Adding Products (database): After collection of product data, an interface was created in order to simplify the process of uploading the data to the firebase database.

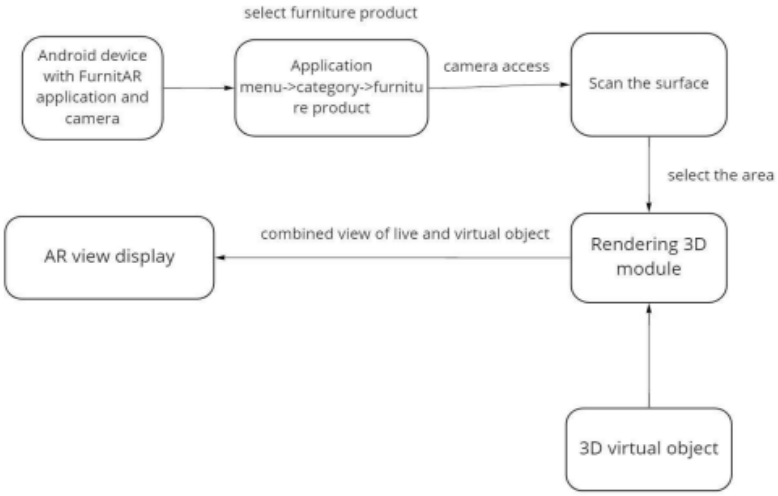

Fig. [1] System Architecture diagram

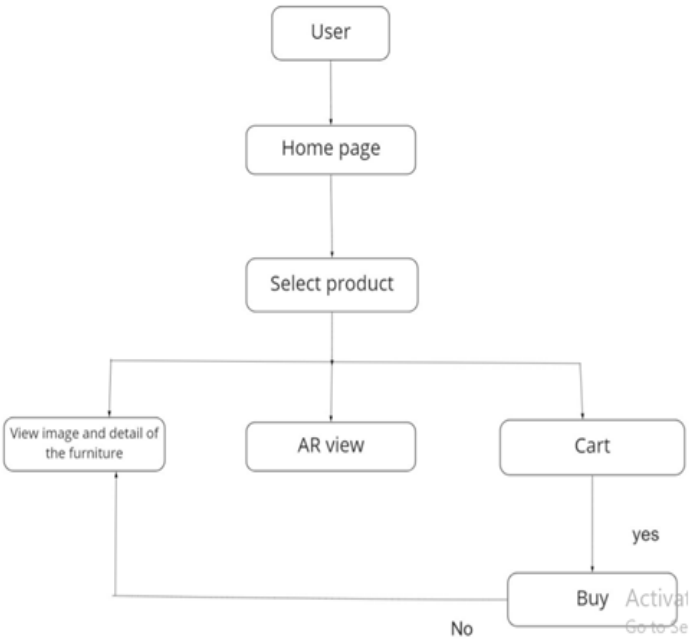

Fig. [2] Flowchart of proposed system

PROPOSED METHODOLOGY

As mentioned, the proposed system is based on Augmented Reality, the following dataflow will explain the workflow.

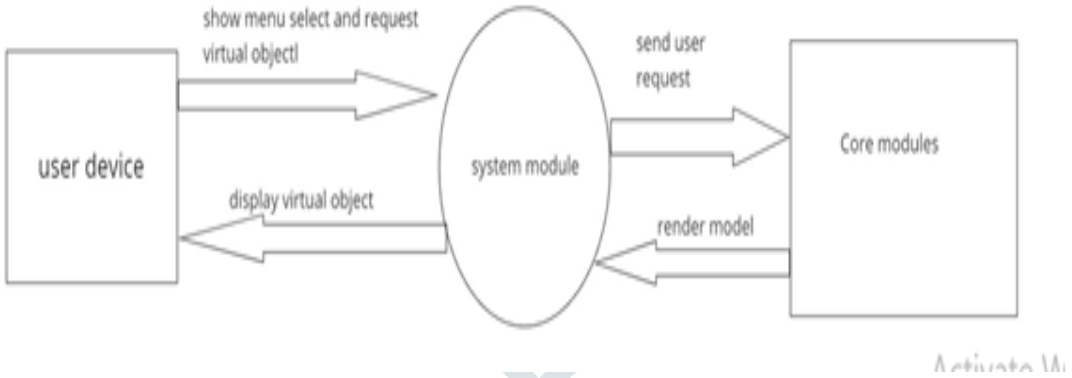

Fig. [3] Data Flow Diagram

Different use case diagrams for our roles are:

A) Admin Role

The below diagram displays the operations which can be performed by admin such as:

1. **Add Products:** Admin can add varieties of furniture product which are available for selling.
2. **Manage Users:** Allows the admin to make changes to the provided credentials and also deactivate their account, if necessary.
3. **Manage Account/Profile:** This allows the admin to reset the admin password, change the login credentials of themselves and manipulate data stored in the database.
4. **Handle Help Requests:** Allows the admin to read the queries raised from the "User's side" and provide solutions accordingly.

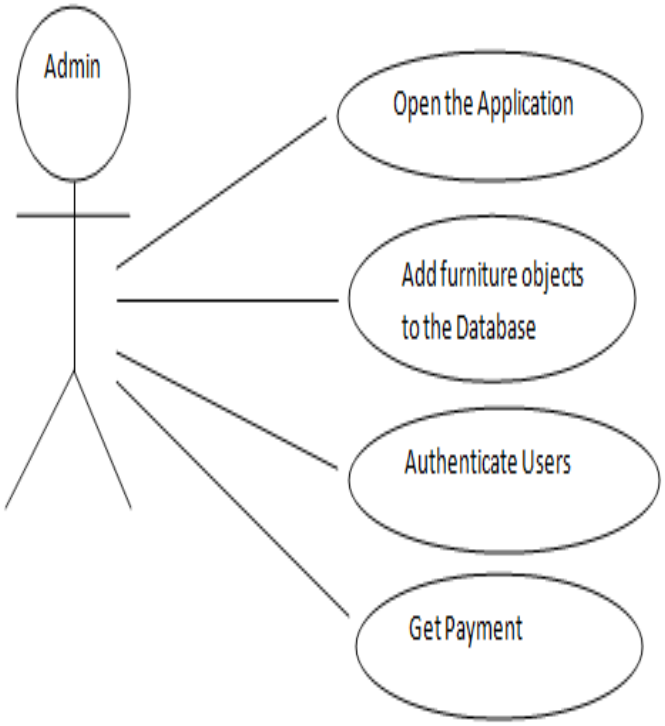

Fig. [5] Admin use case diagram

B) End User Role

The below diagram displays the operations which can be performed by users such as:

1. **View Orders:** User able to see the orders made by them and user can cancel the order before paying the amount.
2. **View Payment:** User able to see the amount they paid for each item.
3. **Give feedback:** User can provide feedback such as reviews & rating on the completed orders.
4. **Search/filter:** It can be used to filter the different furnitures and search for a particular item on the App.

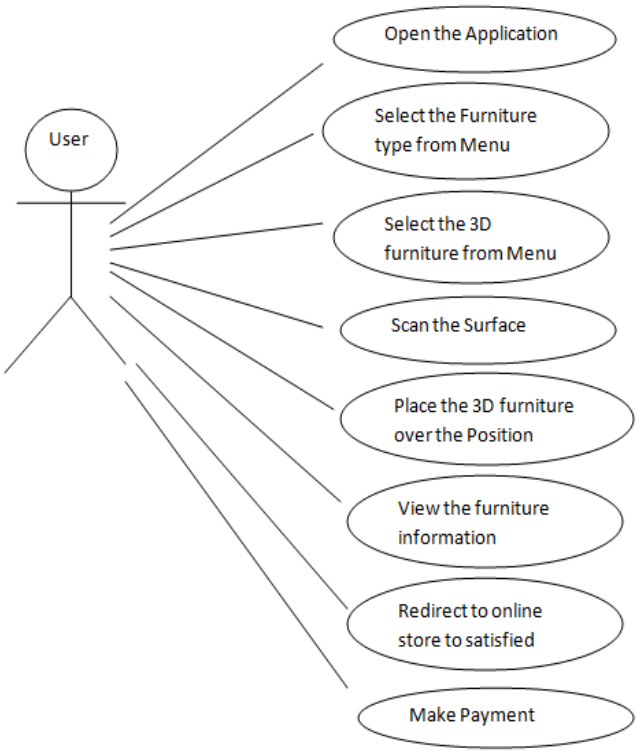

Fig.[6] End User use case diagram

CONCLUSION

The main aim of this "**SET-FurnitAR**" is to analyse the use of augmented reality to render the furniture model in real world. Augmented reality technology that allows the customers to decide and interact the furniture with the real world, offering new possibilities for furniture online shopping. This system will help the customer to view the furniture object virtually in real environment before buying it. Due to this system customer will come to know how their home structure would look after purchasing and placing the furniture object. This proposed system would let the user to try on multiple combinations of object virtually without physically moving the furniture objects. These will help the buyer in determining how to setup the furniture in their home. Enhancing the decision making and reducing the time consumption.

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