

Innovative shopping through mobile using Google's ARCore

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ABSTRACT— *This paper is based on shopping through the augmented reality. By seeing the 3D virtual objects in the environment customer can buy the product and make decisions based on 3D virtual objects. It can increase the purchase rate of the customer. A new customer to the online shopping world can also easily trust and buy the products based on this augmented reality method.*

Keywords-- *Innovative shopping through mobile using Google's arcove*

I. INTRODUCTION

To provide service for the customers to shop through online in a smarter way using augmented reality in mobile application.

Now a day's online shopping plays a major role in everyday life. But in this, some customers are not satisfied with their products while getting after delivery on behalf of this they are returning the products. For this kind of uncomfortable shopping now we can shop the products in some newer way, which is based on augmented reality in the shopping. This gives a clear idea to decide the customer whether to buy a product or not, by using this augmented reality method. Our motive is to give the customer a satisfying shopping on their products in a smarter way.

Augmented reality is a real world connectivity between user and the 3D objects which is placed in the surface of the environment. This gives the user an interactive experience for purchasing the products in the online shopping applications. Augmented reality is added in the application that the user can visualize their products based on the suitable environment. For implementing augmented reality in the shopping application which undergoes some techniques and tools for the images and 3D virtual objects. 3D modelling, Image processing, Motion tracking, Environment understanding, Light estimation. In this project the method tool which is used to implement is ARCore it is a Google's platform for developing augmented reality applications.

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II. EXISTING TECHNIQUES

A. 3D-modelling

The method which is used to create 3D virtual objects for augmented and virtual reality applications. It is the process of developing the mathematical calculations and measurements in the form of three dimensional objects by using some specialized software.

After the creation of the 3D objects that are imported in the augmented reality platform and placed in the real world. Some of the modelling methods are:

Curve Modelling: This model is on curves that based on the geometry surface. It can be both parametric which tells curve surface forms. The curves are working on some mathematical equations that are given by the designer using control points.

Digital Sculpting: It is a new type of 3D model. Where user can make a design using the virtual clay. This virtual clay acts like a real that can be twisted or changed into many forms in the digital screen.

Code-driven modelling: This is used to creating the models with the conditions freely that are set by the designer. This modelling is very useful for 3D printing .That it can generate 3D structures but can't be made through some methods.

B. Image processing

It is the method to process digital images through algorithms. It can reduce the noise and distortion in the digital images. Used to give a proper image or gain some information from the images.

Image editing: In digital image processing, image editing is basically categorized into pixel editing and parametric image editing. Pixel editing is used to alternate the image by its pixel level. Parametric image editing used to change the appearance of the image without doing any alternations in the original image.

Image restoration: In this the images are cleaned were the damaged/noisy images are processed to get back to its original image with some data loss.

C. ARCore

ARCore is the one of the easy methods to implement the augmented reality on mobile application. It is developed by Google and uses the Google's maven repository to fetch the required information. It can be accessed by including "com.google.ar.sceneform"

ARCore tracks the position of the device as it moves, and it understands the real world environment. It uses motion tracking that can access the device camera to identify the surface points and tracks these points on that time.

This combination gives a clear understanding to the ARCore that it can analyse the position and orientation of the device when it moves.

ARCore uses its own algorithm to detect the anchor points on the surface shown by the end-user. Those detected anchor points were used to place the 3D objects into the user screen and results the augmented reality.

III. UML DIAGRAM

We have included three UML diagrams in this paper

D. Activity diagram.

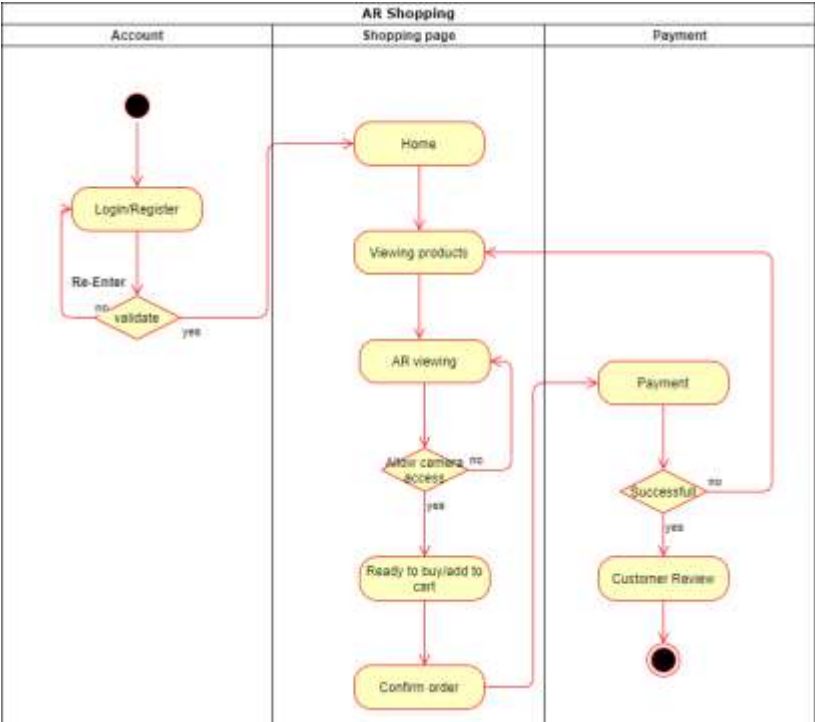


Fig. 1. Activity diagram

E. Use case diagram.

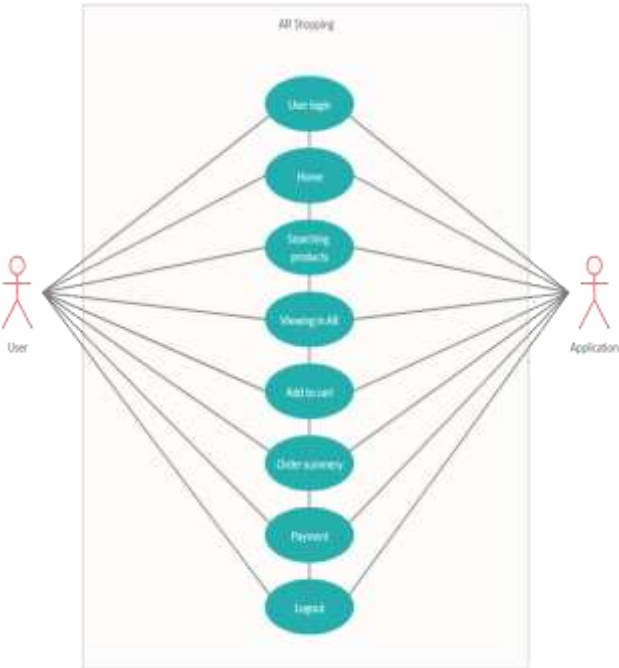


Fig. 2. Use case diagram.

F. Class diagram.

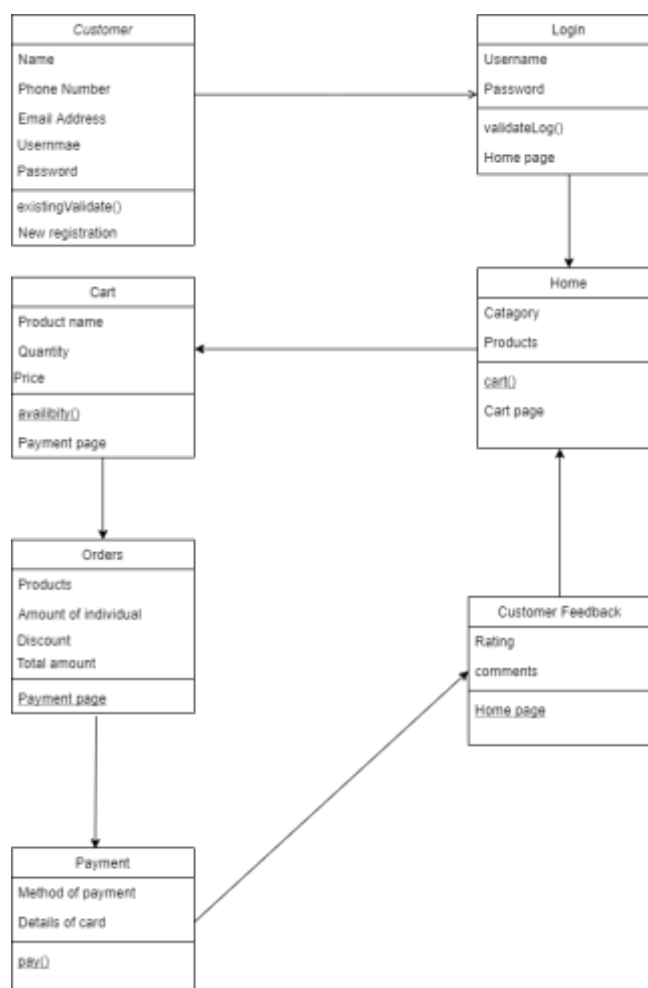


Fig. 3. Class diagram.

IV. MOTION TRACKING

This is used to track the movements of the objects which is placed in the environment. And it checks the activity of the motion templates of the movements while they are matching or not. In “TABLE I” we have measured the anchor points with the different type of surface(s). Google’s ARCore uses its own algorithms to detect the anchor points on the surface.

TABLE I. COMPARING THE SURFACE

S.no	COMPARING THE SURFACE	
	Surface(s)	<i>Founded anchor points in average time of 20 Seconds (S)</i>
1	Plain surface	100 – 200 points
2	Uneven plain surface	70 – 160 points
3	Grass surface	80 – 150 points

S.no	COMPARING THE SURFACE	
	Surface(s)	<i>Founded anchor points in average time of 20 Seconds (S)</i>
4	Uneven surface	20 – 50 points

Note: these points may vary according to the situation/lightning/camera quality



Fig. 4.

Fig. 5.

Fig. 6.

V. IMPLEMENTATION

Google's ARCore uses many methods to implement the augmented application. Android Studio, Android NDK, Unity, Unreal and for even Ios also. Here in this paper we are implementing the Android studio (*Sceneform*) method.

At first set min SDK to 24 install the sceneform plugin on android studio, and include requires app's gradle dependencies in as well as include all the permission in "AndroidManifest.xml" file.

Next step is to import the 3D object(s) to the project. Poly^[1] is the Google's own website where you can find suitable 3D objects needed for the project. Download at any format, include the object in the project. Now right click the imported object and select import sceneform assets, it will generate the SFA and SFB file.

Now create the sceneform fragment on the project's design part. Then include the implementation code for ARCore, in this code at first it checks for the capability of the phone to support augmented reality. If successful then the anchor point code is comes into account. Here the anchors are set with the plain surface which is covered by the back camera.

Once the anchor points are set then the object is waiting for the user's touch to place the imported 3D object. After placing also the user can change the size of the 3D object.

VI. CONCLUSION

Traditional shopping application is widely available but it lacks to deliver the suitable product, here in this project we conclude that the trail object can be seen by the customer and it made effectively. So we concluded that shopping through Augmented Reality is very helpful for the customer for purchasing.

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