ARZARA: Augmented reality app to try Watch on your wrist

Sarthak Gupta, Monil Pahwa , Prayant Gupta, Surinder Kaur *

Information Technology Bharati Vidyapeeth's College of Engg,New Delhi, India

Emails : sarthakgupta041@gmail.com; pahwamonil57@gmail.com; prayantgupta15@gmail.com; kaur.surinder@bharatividyapeeth.edu

*****Correspondence: kaur.surinder@bharatividyapeeth.edu

Abstract

Whenever we visit a showroom to buy a watch, we are unable to try all color variants of watches due to unavailability, and also, if a watch is tried by too many customers, it loses its shine and finishing. We tried to overcome this problem with our Augmented reality app called "Arzara ."This Augmented reality app lets customers see how a particular watch model looks on their hand without physically trying the Watch. It will not only prevent the degradation of the polish of watches due to repeated wear by different customers at offline stores but also this new Augmented Reality watch app will take off online watch shopping. It will make it easier for customers to make decisions and purchase watches.

Keywords: augmented Reality; wrist watch; 3D models

1. Introduction

Augmenting Reality is a real-time technology that places virtual things in the real environment around you. Computer-generated elements are augmented in the real world. It generates a view composition of real scenes viewed by the user and a virtual scene generated by the computer that augments the scene with additional information. The main goal of AR is to create an environment in which users cannot distinguish the difference between the real entities and the virtual entities. It is one of the biggest trends in today's technology.AR apps are software applications that merge the digital visual (audio and other types also) content into the user's real-world environment. [10]

How does Augmented Reality work? Screens, display Glasses, handheld devices, mobile phones, and head-mounted displays can be used for AR display. AR renders objects through technologies like SLAM stands for simultaneous localization and mapping, and Depth Tracking. There are mainly 2 types of augmented Reality today: Marker-less AR and Marker-based AR. Marker-based AR requires a static image, trigger photo, or target marker that users can scan using their smartphone via a mobile app. This will serve as a marker to show the desired entity. The scan will look for the trigger image's size, markers, and corners and accordingly show the visual. The AR device also calculates the position and orientation of a marker to position the content in some cases. In contrast, marker-less AR works by scanning the environment surrounding it. There is no need for a marker or trigger photo or target market. Apps with such functionality demand a flat surface like a table or floor for placing the AR element else. The object will look like floating in the air.[4][8]

Today most devices support AR technology. For processing and projection, AR requires basic requirements like sensors, cameras, accelerometer, gyroscope, digital compass, GPS, CPU, and displays.

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AR devises categories:

1) Mobile devices (smartphones and tablets) – are the most favorable device for AR games and apps.

2) In specially designed AR devices like Head-Up Displays (HUD), data is sent directly to the user in a transparent display.

3) AR glasses (or smart glasses) – Google Glasses, Meta 2 Glasses, Laster See-Thru, LA forge AR eyewear, etc. these devices can show the mobile notifications, assist factory workers, and can make hand-free work easy.

AR contact lenses (or smart lenses) are the next level of innovation. Samsung and Sony are currently working on it.

1.1 Classification Of Ar Apps:

a. Augmented Reality in 3D viewers:

It allows users to put life-size 3D models in their environment with or without scanning trackers. Trackers are just simple markers that can be Augmented. Existing apps are AUGMENT and Sun-seeker.

Augment: In a real-time and real 3D environment, users can see products in real-time. This app can also be used for E-Commerce, Architecture, Retail, and other purposes. Through Augment, users can experience the products before actually buying them, which would help retailers and manufacturers and improve the market's efficiency. The product can be viewed from all directions by rotating it and hence can better understand the products. It has plenty of customers. Companies such as Coca-Cola, Siemens, Nokia, Nestle, and Boeing are using this application.

Sun-Seeker: This app provides a flat compass view along with hour intervals, sunrise and sunset times, and much more. The app is perfect for -

- Photographers - Ideal light conditions, sunrise or sunset can be easily set through it.
- Cinematographers -Exact exposure to Sun, directions, and times for any location.
- Real Estate Buyers - To search the properties with sun exposure and serve the customer demand.
- Drivers - To find how long the car will remain in the shade at any parking spot.
- Architects - Designs can be visualized and can be improved better.[5]

b. Augmented Reality in Browsers:

In browsers, augmented Reality can enhance the webpage with some particular content information. For example, users can point at a building.

Argon4: The web browser with fully functional AR which can show the contextual information for the particular products it is designed for. Argon4 allows building any 3D model to be augmented. It works like other browsers that can open various tabs with different AR implementations.

c. Augmented Reality Games:

Gaming is one of the industries that use AR the most. The most common apps that use AR are Pokémon Go, Treasure Hunt, Real Strike, Zombie Go, etc.

Pokémon Go is the most famous game in which users have to catch virtual Pokémon. It also uses the device location to make users go far and outside in the real world to catch the Pokémon hidden in the different real-world locations. Fig 1 shows the UI of Pokémon Go.

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Figure 1: Pokémon Go screenshot

Real Strike: This game offers a real shooting environment virtually that gives users a real shooting experience. A marker is to be scanned by the user through phones and find out the target. It also offers night vision and thermal goggles to fight in the level of extreme conditions and complete missions in the evening.

d. Augmented Reality GPS:

This concept app uses GPS and Compass to find the device's exact location and orientation. Examples: AR GPS Drive/Walk Navigation, AR GPS Compass Map 3D, etc.

2. About Arzara

This app uses AR technology to show wrist watches on the user's wrist. The user has to select the model of Watch he/she would like to try on. That Watch will be adjusted on his/her wrist. Screens, display Glasses, handheld devices, mobile phones, and head-mounted displays can be used for AR display.AR renders objects through technologies as SLAM stands for simultaneous localization, mapping, and depth tracking. There are mainly 2 types of augmented Reality today: Marker-less AR and Marker-based AR. A real physical marker which is in the form of a wrist band, has to be worn by the user and scan that marker using the mobile app. After that user has to choose the watch model he/she wishes to try on.

3. Implementation

Implementation of the app is mainly divided into three parts:

- Generation of band
- Design of E-catalogue
- Trying Watch on hand

a. Generation of band

In order to try the Watch on hand, customers have to wear a band. The accuracy of the band decides on maximum feature points. Feature points are unique elements that each image has. They are edges, spots, or curves that look the same when seen from different angles. We are using Vuforia for feature extraction because Vuforia delivers a robust and precise AR experience in a variety of environments. Fig 2 shows a pattern that we've designed for our paper band.

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Figure 2: Paper pattern

Vuforia gives a star rating on the basis of feature extraction, and the above pattern is given 5 out of 5 stars. We have used a cylindrical band instead of a flat band as the user wears a band on their wrist. Users have to download the image, take a printout of it and wear it on their wrist.

b. Designs of E-catalogue

E-catalogue will contain 3d models of the Watch. Fig 3 shows a sample E-catalogue through which users can choose watches.

Figure 3: E-catalogue

For designing 3d models, there is a lot of software available. Fig 4 shows three basic watch models, which we've designed using blender and Maya to demonstrate the concept.[3]

Figure 4: Watch Models

Trying Watch on hands: We are using unity 3d for building our AR mobile app because:

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- Vuforia and AR work perfectly together.
- We can create AR applications without AR Core using unity 3d, which this app can be used on any device having a camera in it.
- It is easy to integrate 3d models in unity.

We've projected a 3d object(i.e., Watch) on a flat surface(i.e., a band). Whenever an app encounters a band, then it will project Watch on it. UI is designed using C#. As of now, we've given two buttons (Next and Previous) in our app. These buttons are used to select the watch model. Fig 5 shows a basic version of our app.

Figure 5: Prototype Screen

4. Analysis

The following graphs based on studies and surveys show the analysis of AR experience by various users and how AR is adopted by various businesses.[6]

A. User experience analysis with AR: Fig 6 represents the overall experience of users after using AR apps. Users are analyzed on different parameters. According to data, the majority face issues in incomplete information architecture. Therefore we will try to make our app as user-friendly as possible. It will give an experience like offline stores.

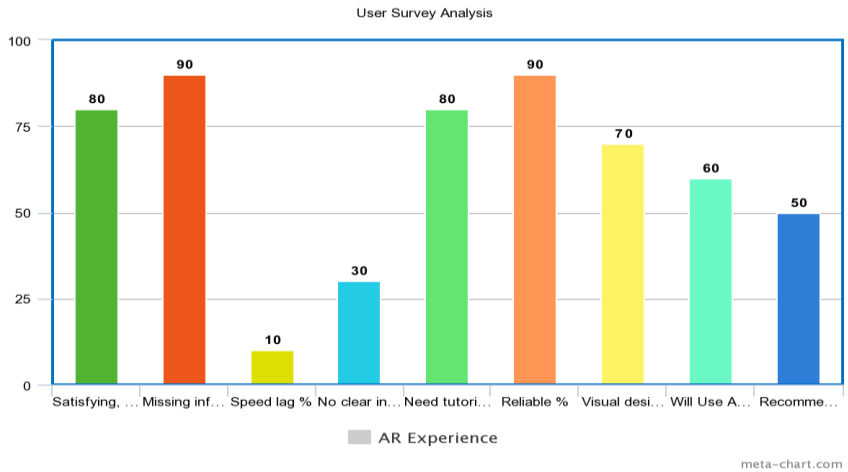

Figure 6: User survey analysis

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Table 1: is a tabular representation of the above graph.

Parameters	%
Satisfying, Not stimulating	80
Missing information architecture	90
Speed lag	10
No clear input prompts	30
Need tutorial & error messages	80
Reliable	90
Visual design	70
Will Use Again	60
Recommend	50

Table 1: User survey analysis

B. AR Adoption in various apps: Fig 7 shows the use of Augmented reality apps in different sectors. According to the graph, AR apps are highly used in areas where remote work is involved.

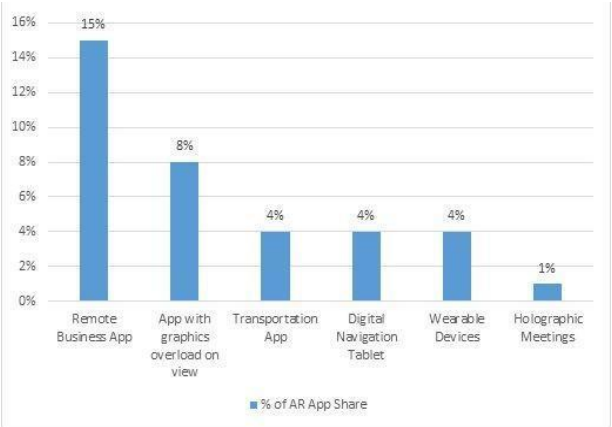

Figure 7: AR adoption in various sectors [11]

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5. Conclusion and future work

We highlight some aspects relevant to the expectations of potential users, particularly the ease and simplicity of the app ARZARA. In the future, we will improve its UI so that customers can interact with the app. We will try to add a button using which the 3d model can be directly inserted into the e-catalogue present in the app. We will also try to add other related accessories to this app.

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