ABSTRACT

Interactive shopping using augmented reality (AR) is a rapidly growing trend in the retail industry. This technology enables customers to view products in a more immersive and interactive way, enhancing their shopping experience. In this paper, we present an abstract for the development of an AR-based shopping platform that allows customers to virtually try on clothes, accessories, and makeup productive, and interact with them in real-time. The platform will be designed to be user-friendly and intuitive, making it accessible to customers of all ages and technical abilities. The proposed system will use advanced computer vision and machine learning algorithms to recognize the customer's body shape, size, and skin tone to provide personalized recommendations. The platform's potential benefits include increased customer engagement, improved conversion rates, and enhanced customer satisfaction. This abstract provides an overview of the proposed system's features and functionally and outlines the overlays digital information onto the real world, creating an interactive and immersive experience. In recent years, retailers have started using AR to enhance the shopping experience for or their customers. By using AR customers can visualize products in 3D, see how they would look in different colors or sizes, and even interact with them in real-time. This technology for items has the clothing accessories, and makeup, where seeing how they look on the body is essential.

1. INTRODUCTION

Interactive shopping using augmented reality is a technology that is rapidly growing in popularity within the retail industry. Augmented reality involves overlaying digital information onto the real world, allowing customers to see products in a more immersive and interactive way. By using AR, customers can visualize products in 3D, try on virtual clothing or accessories, and even interact with products in real-time.

One of the most significant benefits of interactive shopping using augmented reality is that it offers customers a more personalized experience. By using advanced computer vision and machine learning algorithms, AR can recognize the customer's body shape, size, and skin tone, and provide personalized recommendations and suggestions. For example, an AR-based makeup application can detect the customer's skin tone and suggest products that match their complexion, while an AR-based clothing application can suggest clothing items that fit the customer's body shape and size.

Another benefit of interactive shopping using augmented reality is that it can increase customer engagement and satisfaction. By offering an immersive and interactive experience, customers are more likely to spend time exploring products and engaging with the brand. This, in turn, can lead to increased conversion rates and customer loyalty.

To implement an AR-based shopping platform, retailers need to invest in the necessary technology, including AR-enabled devices such as smartphones or tablets, as well as specialized software and hardware for AR development. They also need to ensure that their platform is user-friendly and intuitive, making it accessible to customers of all ages and technical abilities. The platform must be designed to offer a seamless and immersive experience, ensuring that customers can interact with products in a way that feels natural and intuitive.

In conclusion, interactive shopping using augmented reality is an exciting development in the retail industry, offering customers a more personalized and engaging shopping experience. As technology continues to advance, we can expect to see more retailers adopting AR in marketing and sales strategies, with the potential to transform the way customers shop for products.

2. LITERATURE SURVEY

- "Augmented reality in retail: A review and future directions" by S. Hussain and C. O. Yigitbas (2021):

  This study provides a comprehensive review of augmented reality in retail and highlights the potential of AR technology to transform the retail industry. The study explores the current state of AR technology in retail, including its applications and limitations. The study also discusses the potential benefits of AR technology, such as increased customer engagement and satisfaction, reduced returns, and increased revenue. The study identifies several challenges and limitations of AR technology in retail, such as technical limitations, high implementation costs, and privacy concerns. The study also provides recommendations for future research, such as developing more sophisticated AR applications**,** addressing technical limitations, and improving the user experience.

- "The effect of augmented reality on customer engagement and purchase intention in online fashion retailing" by M. Y. Kim and H. J. Song (2020):

  This study examines the effect of augmented reality on customer engagement and purchase intention in online fashion retailing. The study compares the effects of augmented reality with traditional 2D product images and finds that AR technology can significantly increase customer engagement and purchase intention. The study also identifies several factors that influence the effectiveness of AR technology, such as the quality of the AR experience, the product type, and the user's level of familiarity with AR technology. The study concludes that AR technology has the potential to transform the way customers shop for

products online, providing a more engaging and personalized shopping experience.

- "Exploring the use of augmented reality in the retail industry" by C. Y. Poon and K. C. Ng (2020):

  This study explores the use of augmented reality in the retail industry and identifies several potential applications of AR technology in retail, such as virtual try-on, product visualization, and in-store experiences. The study also discusses the benefits of AR technology in retail, such as increased customer engagement, reduced returns, and increased revenue. The study also identifies several challenges and limitations of AR technology in retail, such as technical limitations, high implementation costs, and privacy concerns. The study concludes that AR technology has the potential to transform the retail industry, but that more research is needed to address technical limitations and improve the user experience.

- "Augmented reality in marketing and advertising: **A** review of the literature" by E. A. Garcia-Pérez, A. Gutiérrez-Cillán, and M. A. Torres-Olivera (2020):

  This study provides a comprehensive review of augmented reality in marketing and advertising and highlights the potential of AR technology to create more engaging and interactive experiences for customers. The study explores the current state of AR technology in marketing and advertising, including its applications and limitations. The study identifies several benefits of AR technology in marketing and advertising, such as increased customer engagement, increased brand awareness, and increased purchase intention. The study also identifies several challenges and limitations of AR technology in marketing and advertising, such as technical limitations and privacy concerns. The study concludes that AR technology has the potential to transform the way companies market and advertise their products, but that more research is needed to address technical limitations and improve the user experience.

- "The impact of augmented reality on consumer purchase decision: An experimental study" by M. C. H. Ngai and Y. Tao (2019):

  This study examines the impact of augmented reality on consumer purchase decisions.

3. SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

The existing system of shopping has been successful for many years and has provided customers with a convenient way to purchase products. However, it has several limitations that have led retailers to explore the use of AR technology to enhance the shopping experience.

One of the limitations of the existing system of shopping is the physical constraints of a store. Customers may not find the products they are looking for, and they may have to wait in line to pay at the checkout. This can lead to frustration and a negative shopping experience. With AR technology, retailers can provide customers with an immersive and personalized shopping experience that can alleviate these issues.

For example, some retailers have implemented AR technology in their stores to provide customers with virtual try-on experiences for clothing and makeup. Customers can use AR-enabled mirrors or screens to see how clothing or makeup products would look on them in real-time, without having to physically try them on. This can save customers time and improve their shopping experience.

Another limitation of the existing system of shopping is the lack of interactivity in the online shopping experience. Customers may not be able to try on clothes or see products in person before making a purchase, which can lead to returns and dissatisfied customers. AR technology can address this limitation by providing customers with a more interactive and engaging online shopping experience.

For example, some retailers have implemented AR-enabled product pages on their websites or mobile applications. Customers can use their smartphone camera to overlay virtual images of products onto their physical environment, allowing them to see how the product would look in their home or office. This can help customers make more informed purchasing decisions and reduce the likelihood of returns.

Overall, the limitations of the existing system of shopping have led retailers to explore the use of AR technology to enhance the shopping experience. By providing customers

with a more immersive and personalized shopping experience, retailers can increase engagement, satisfaction, and sales.

3.1.1 DISADVANTAGES

- **Limited availability:** In physical stores, customers are limited to the inventory that is available in the store, and they may not be able to find the products they are looking for. In online shopping, products may not be available due to stock limitations or shipping restrictions. This can be frustrating for customers who are looking for specific products or are on a tight schedule.
- **Lack of personalization:** The existing systems of shopping offer limited personalization options. Customers may not be able to find products that match their specific preferences or needs. This can lead to dissatisfaction and decreased customer loyalty. Inability to try before buying: In both physical and online shopping, customers may not be able to try on clothes, test out products, or see products in person before making a purchase. This can lead to dissatisfaction and increased returns, which can be costly for retailers.
- **Long wait times:** In physical stores, customers may have to wait in long lines to pay at the checkout, and in online shopping, products may take a long time to arrive due to shipping times. This can be frustrating for customers who are looking for a quick and convenient shopping experience.
- **Limited interactivity:** Existing systems of shopping offer limited interactivity, making it difficult for customers to engage with products and make informed purchasing decisions. This can result in customers choosing to shop elsewhere or not making a purchase at all.
- **Lack of real-time information:** In both physical and online shopping, customers may not have access to real-time information such as product availability, pricing, and promotions. This can lead to confusion and frustration for customers who are looking for the most up-to-date information.

3.2 PROPOSED SYSTEM

- **Mobile application:** A mobile application that is compatible with both Android and iOS platforms will be developed. This application will serve as the interface for customers to interact with products using AR technology. Customers will be able to download the application from the app store and use it to browse products, view product information, and try on clothes virtually.
- **Product database:** A database of products will be created, containing information about each product, including images, descriptions, and pricing. This database will be integrated with the mobile application and will be used to display products to customers.
- **AR technology:** AR technology will be used to allow customers to try on clothes virtually, see products in their physical environment, and interact with products in real-time. The AR technology will be integrated into the mobile application**,** allowing customers to use their smartphone or tablet to access the AR features.
- **Payment gateway:** A secure payment gateway will be integrated into the mobile application, allowing customers to make purchases directly from the application. This payment gateway will be designed to ensure that customer's personal and financial information is secure.
- **Customer support:** A customer support system will be implemented to provide customers with assistance in using the mobile application and AR technology. The customer support system will be available 24/7 and will be accessible throughthe mobile application.

3.2.1 ADVANTAGES

- Enhanced Visualization
- Increased Engagement
- Personalization
- Convenience

3.3 MODULES

- User interface module
- Augmented reality module
- Product management module
- Payment module
- Analytics module
- Marketing module

4. FEASIBILITY STUDY

Market Analysis

Research the current market trends and consumer behavior regarding shopping preferences. Identify the target demographic and their receptiveness to AR technology in the shopping experience.

Technology Assessment

Evaluate the available AR technologies and their suitability for interactive shopping experiences. Consider factors such as ease of implementation, compatibility with existing systems, and cost-effectiveness.

Cost-Benefit Analysis

Estimate the costs associated with implementing AR technology in shopping, including hardware, software development, maintenance, and staff training. Compare these costs with the potential benefits such as increased sales, customer engagement, and brand loyalty.

Technical Feasibility

Assess the technical feasibility of integrating AR into existing shopping platforms or developing new AR-enabled applications. Consider factors such as scalability, performance, and compatibility with different devices.

Risk Assessment

Identify potential risks and challenges associated with implementing AR in shopping, such as technological barriers, consumer adoption hurdles, and competitive pressures. Develop mitigation strategies to address these risks effectively.

5.SOFTWARE REQUIREMENT SPECIFICATION

5.1 HARDWARE REQUIREMENT

- Mobile devices
- AR-enabled devices
- Cameras
- Sensors
- Network connectivity

5.2 SOFTWARE REQUIREMENT

- Operating system
- Augmented reality SDK
- Mobile application development framework
- 3D modeling software
- Database management system
- Payment gateway integration

6.SYSTEM DESIGN

Designing a system for interactive shopping using augmented reality (AR) involves integrating AR technology with existing e-commerce platforms or developing a standalone AR shopping application. Here's an outline of the system design for interactive shopping using AR.

AR Interface

Design an intuitive AR interface that allows users to interact with virtual products overlaid onto the real world.

Navigation

Implement easy-to-use navigation controls for users to browse products, view details, and make selections**.**

Product Visualization

Enable users to visualize products in 3D space, allowing them to rotate, zoom, and inspect items from different angles.

Virtual Try-On

Implement virtual try-on functionality for products like clothing, accessories, or cosmetics, allowing users to see how items look on themselves in real-time using their device's camera

AR SDK Selection

Choose an appropriate AR software development kit (SDK) such as ARKit for iOS, ARCore for Android, or cross-platform frameworks like Unity or Vuforia.

6.1 UML DIAGRAMS

6.1.1 CLASS DIAGRAM

The class diagram is the main building block of object-oriented modeling. It is used for both the general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling.The classes in a class diagram represent both the main objects, interactions in the application and the classes to be programmed. In the diagram, classes are represented with boxes which contain three parts:

- The upper part holds the name of the class.
- The middle part contains the attributes of the class.
- The bottom part gives the methods or operations the class can take or undertake.

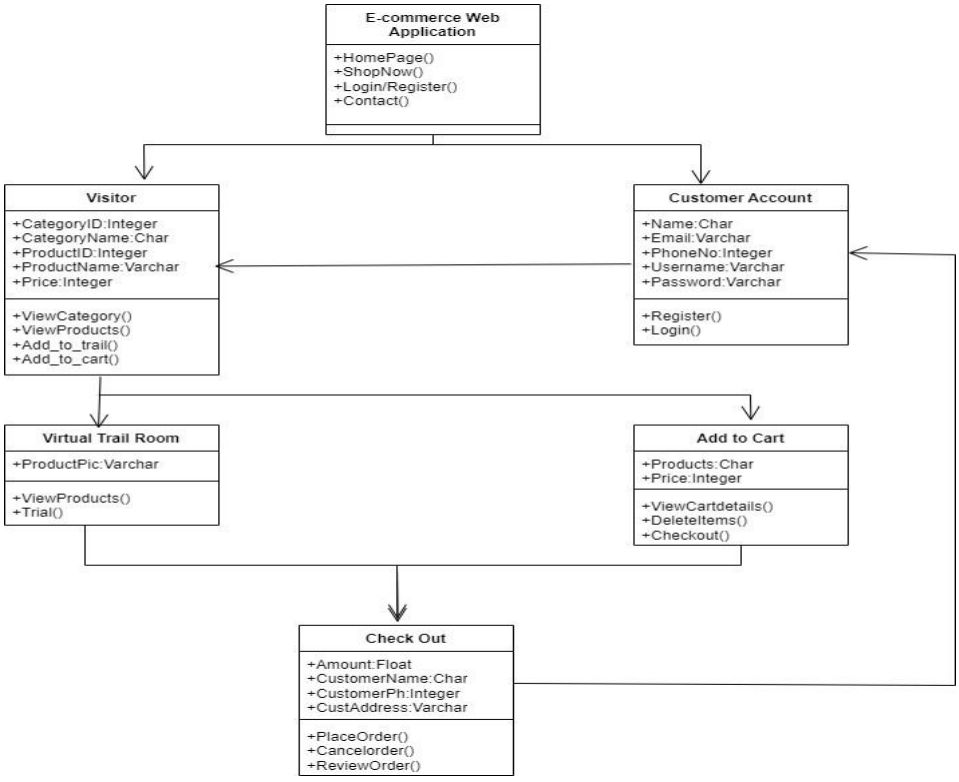

FIG NO.6.1.1.1. CLASS DIAGRAM

6.1.2 SEQUENCE DIAGRAM

A sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use caserealizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

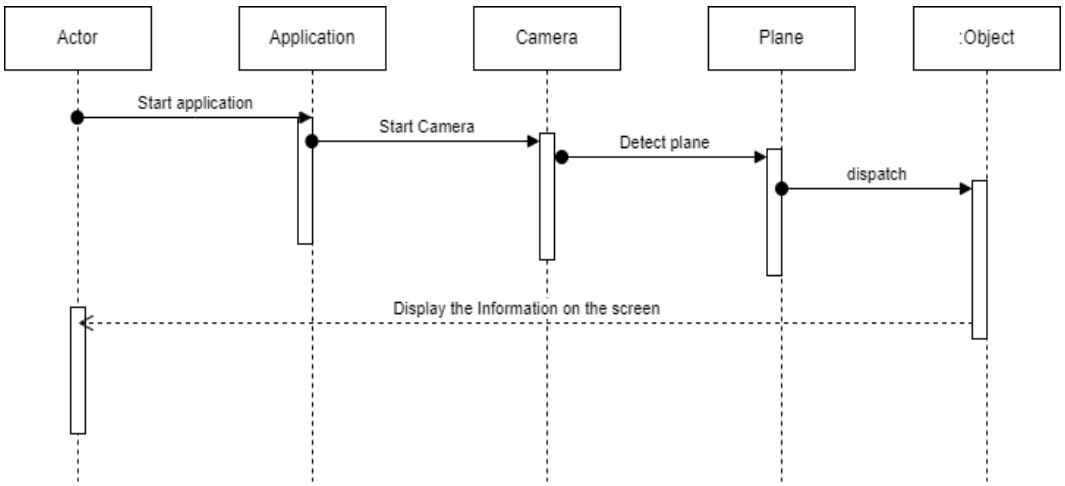

FIG NO .6.1.2.1 SEQUENCE DIAGRAM

6.1.3 USECASE DIAGRAM

A use case diagram at its simplest is a representation of a user's interaction with the systemand depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. This type of diagram is typically used in conjunction with the textual use case and will often be accompanied by other types of diagrams as well.

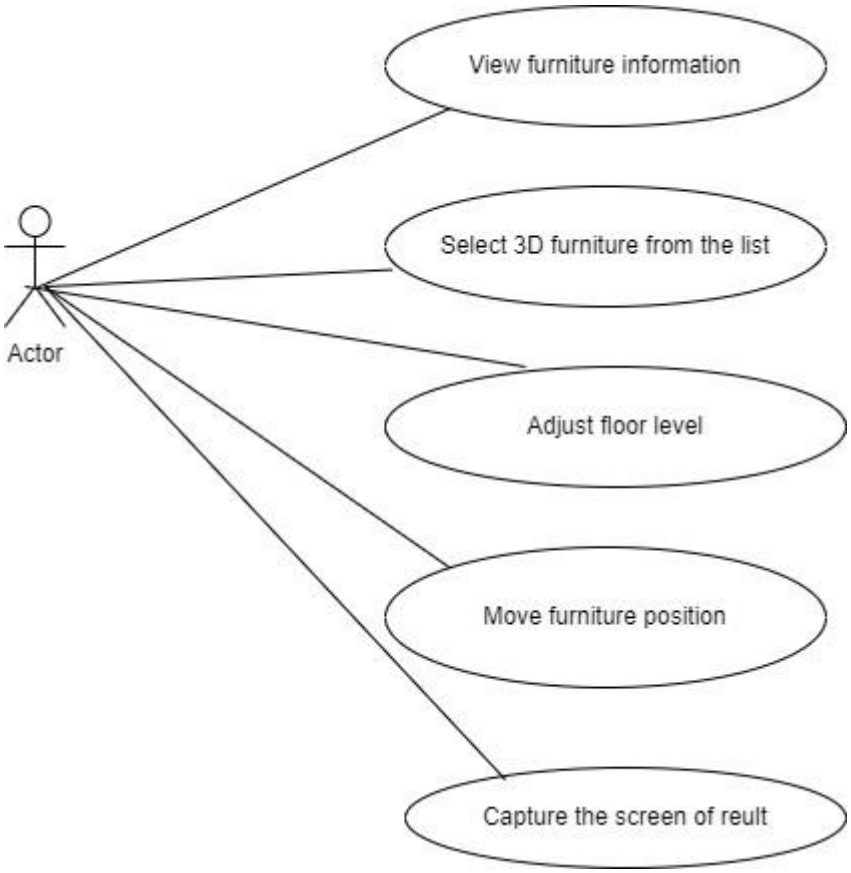

FIG NO.6.1.3.1 USECASE DIAGRAM

6.1.4 ACTIVITY DIAGRAM :

The process begins when the user accesses the online shopping platform. The user navigates through various categories and products available on the website or app. If the user has something specific in mind, they can use the search feature to find particular products Once the user finds a product they're interested in, they select it to view more details.If the user decides to purchase the product, they add it to their shopping car The user can review the items in their cart, adjust quantities, or remove items if needed. When the user is ready to make a purchase, they proceed to the checkout process.

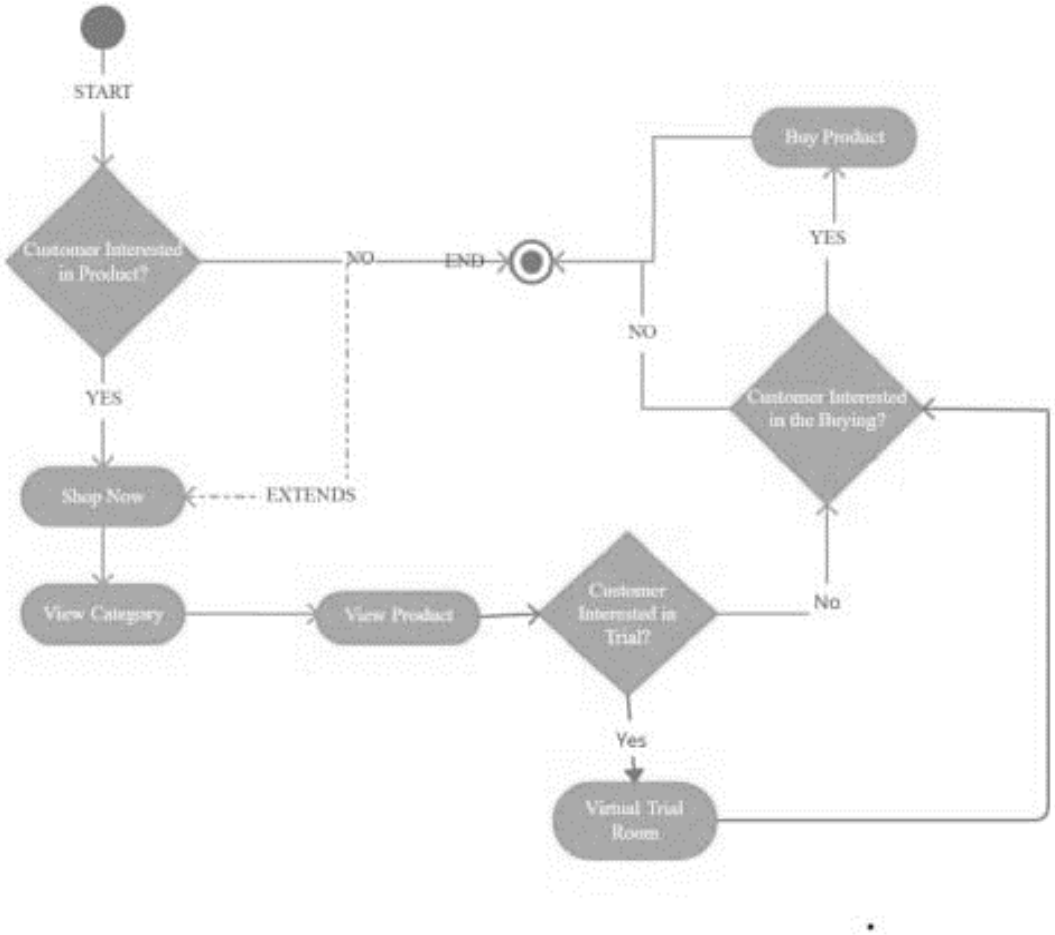

FIG NO: 6.1.4.1 ACTIVITY DIAGRAM

6.2 CONTROL FLOW DIAGRAM

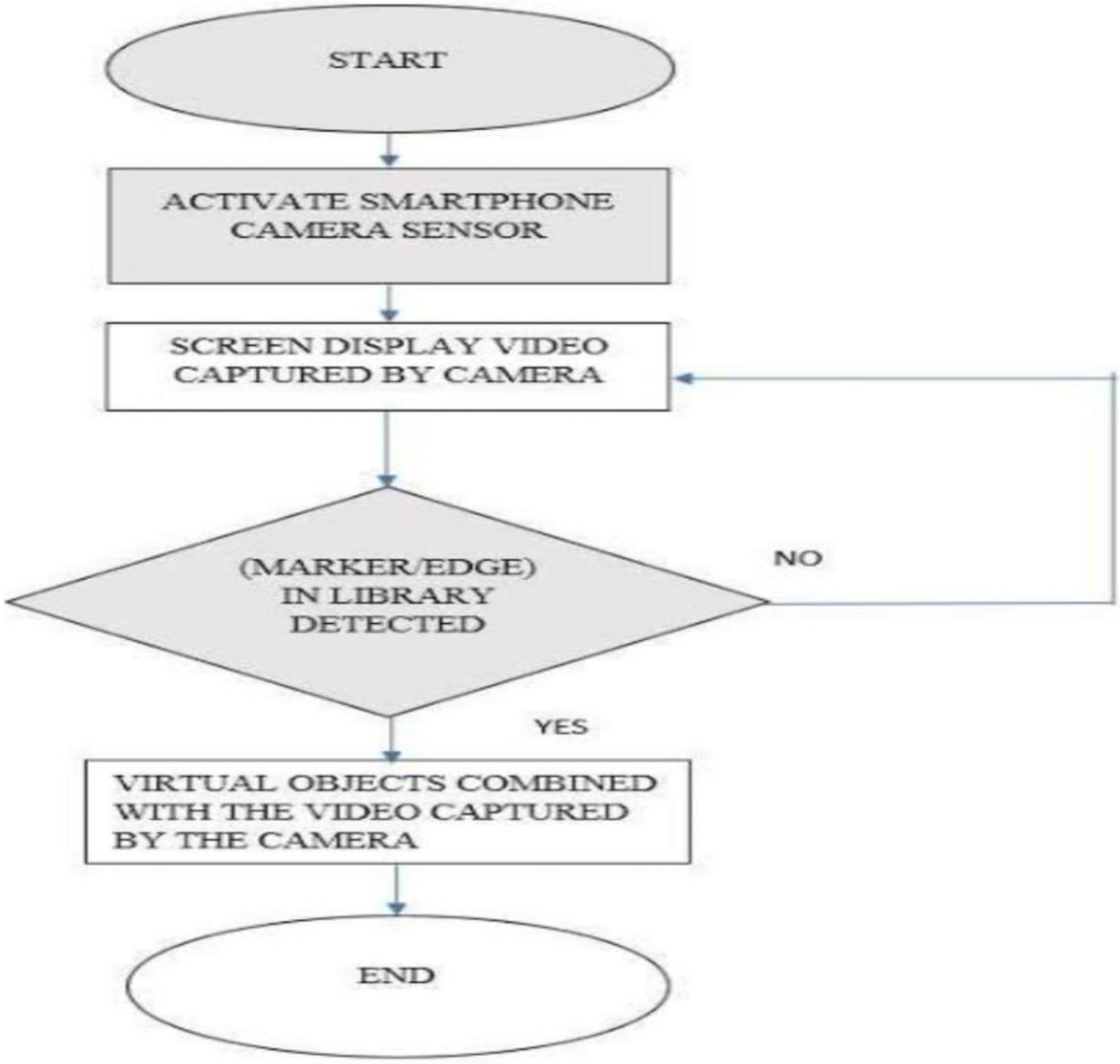

FIG NO:6.2.1 CONTROL FLOW DIAGRAM

6.3 E-R DIAGRAM

ER Model stands for Entity Relationship Model is a high-level conceptual data model diagram. ER model helps to systematically analyze data requirements to produce a well-designed database. The ER Model represents real-world entities and the relationships between them. Creating an ER Model in DBMS is considered as a best practice before implementing your database.

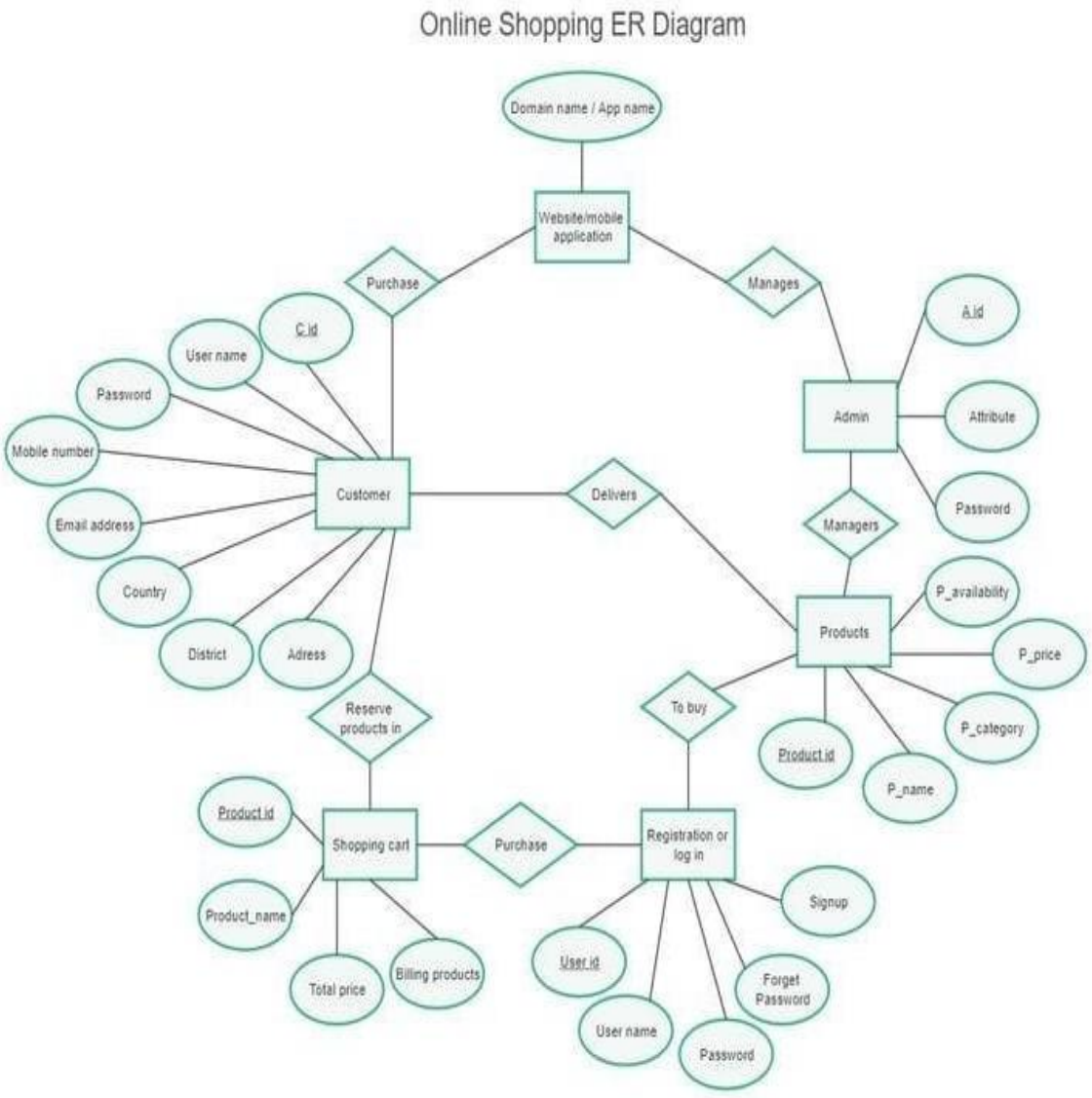

FIG NO. 6.3.1 E-R DIAGRAM

7.SYSTEM IMPLEMENTATION

7.1 SYSTEM ARCHITECTURE

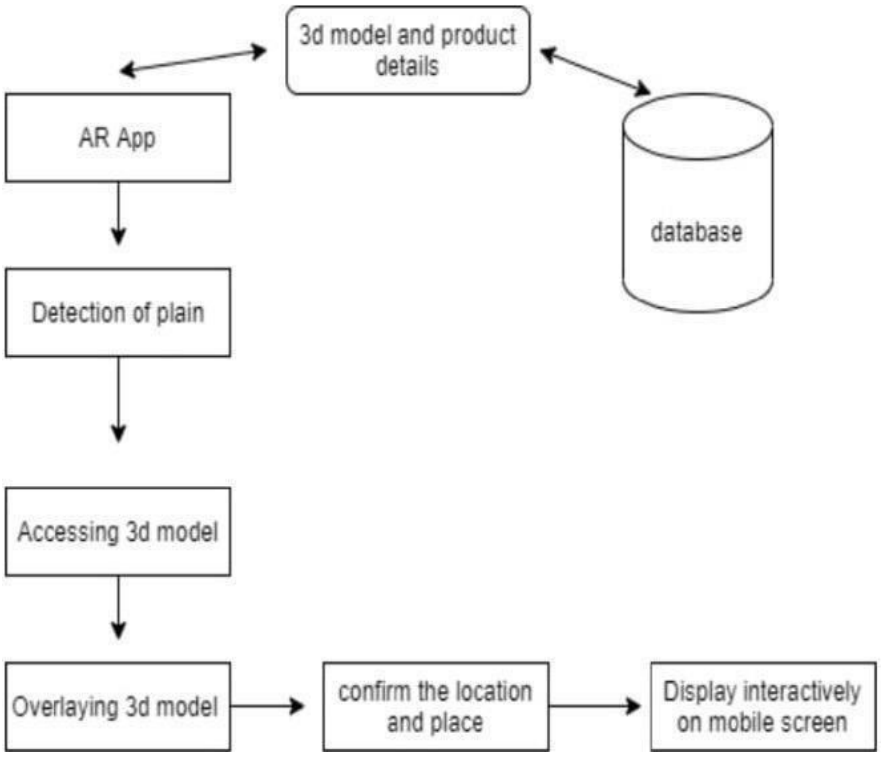

FIG NO. 7.1.1 SYSTEM ARCHITECTURE

7.2 ALGORITHM

- **COMPUTER VISION:** Computer vision plays a crucial role. Computer vision algorithms analyze the user's camera feed to understand the surrounding environment and detect objects.
- **OBJECT RECOGNITION:** Object recognition algorithms can identify specific products or items in the user's environment. The object recognition algorithm can analyze your camera feed and detect the presence of face.

7.3 SAMPLE CODE

MainActivity.kt

```
Package hackon.lifetime.shopon

import android.os.Bundle

import  androidx.appcompat.app.AppCompatActivity

import androidx.appcompat.app.AppCompatDelegate

import hackon.lifetime.shopon.R

import hackon.lifetime.shopon.models.Product

val products=mutableListOf(

  Product(

    1, “Wooden Chair”, “4,900”,R.drawable.wooden_chair,

   “FREE delivery by Wed,10 Aug”,

   “Acacia Wood and Natural Cane Weaving”,

    4.5f, “1,210”,

“https://firebasestorage.googleaapis.com/v0/b/whatschat-
1348c.appspot.com/o/chair.glb?alt=media&token=e32cf525-ee71-4490-a38e-
0c42f49be3b2”

),

Product(

 2, “Canteen Table”, “4,500”,R.drawable.table,

 “FREE delivery by Thu, 11 Aug”,

 “Crafted of Oak wood legs,the sleek veneer top showcases a rick woodgrain finish.”,

  4f, “895”,
```

“https://firebasestorage.googleapis.com/v0/b/whatschat-1348c.appspot.com/o/canteenTable.glb?alt=media&token=c6d913d9-847c-4e4c-8907-51ccf0b56c96”

),

Product(

3, “Pedestial Fan”, “3,200”,R.drawable.pedestal_fan,

“FREE delivery by Mon,8 Aug”,

“Pedestal Fan Wind Storm 18 inch features a powerful energy efficient heavy duty motor,telescopic height adujustment and three-speed control.”,

3.5f, “4,752”,

“https://firebasestorage.googleapis.com/v0/b/whatschat-1348c.appspot.com/o/coolerfan(without-defense).glb?alt=media&token=9ec989b7-82da-4892-b2b6-926fa7dd3f92”

),

Product(

4, “Mobile Tripod”, “500”, R.drawable.tripod_image,

“FREE delivery by Wed,10 Aug”,

“360 degree rotation,easy to carry,easy to use and Good Stability and has powerful absorption and deformation functions suitable for mobile phone upto 6 inches.”,

4f, “14,396”,

“https://firebasestorage.googleapis.com/v0/b/whatschat1348c.appspot.com/o/Tripod%20Grip.glb?alt=media&token=c8c8650f-8980-4848-ba46-130b7d90cc83”

),

Product(

5, “Office Chair”, “11,880”, R.drawable.office_chair,

“FREE delivery by Tue,9 Aug”,

“Chair with lumbar support and pneumatic gas lift for height adjustment and 360 degree swivel.”,

4.5f, “257”,

“https://firebasestorage.googleapis.com/vo/b/aadhar-address-updation.appspot.com/o/chair.glb?alt=media&token=ca3b384fa-e8b2-4c85-bff1-1bob63272c1e”

).

Product(

6, "Bar Chair", "5,500", R.drawable.bar_chair,

"FREE delivery by Wed, 10 Aug",

"Stable And Sturdy Bar chair - With a built-in 360 degree swivel. High density foam upholstered in leatherette.",

4f, "1,664",

“https://firebasestorage.googleapis.com/v0/b/aadhar-address-updation.appspot.com/o/bar_chair.glb?alt=media&token=f17dee7-1bff-4ff0-86ea-9542f68146cb”

),

Product(

7, "Park Bench", "12,500", R.drawable.park_bench_photo,

"FREE delivery by Fri, 12 Aug",

"The large garden bench seat pad offers the perfect mix of appearance and functionality",

3.5f, "578",

"https://firebasestorage.googleapis.com/v0/b/aadhar-address-updation.appspot.com/o/park_bench.glb?alt=media&token=8afb7436-7dc2-411e-9b9a-3583c076fc8f"

),

Product(

8, "Microwave Oven", "15,000", R.drawable.oven_photo,

"FREE delivery by Thu, 11 Aug",

"GRILL, BAKE & TOAST - Use the oven for baking cakes, pizzas and pastas, grilling vegetables, roasting potatoes, chicken, paneer or simply toasting bread.",

4.5f, "734",

"https://firebasestorage.googleapis.com/v0/b/aadhar-address-updation.appspot.com/o/oven.glb?alt-media&token=116d796f-9619-45c2-b170-9704520c7582"

)

)

class MainActivity AppCompatActivity(){

override fun onCreate(savedInstanceState Bundle?){

AppCompatDelegate setDefaultNightMode(AppComapactDelegate MODE_NIGHT_NO)

super onCreate(savedInstanceState)

setContentView(R.layout activity_main)

}

}

ExampleInstrumentedTest.kt

package hackon.lifetime.shopon

import androidx.test.ext.junit.runners.AndroidJUnit4

import androidx.test.platform.app.InstrumentationRegistry

import org.junit.Assert.assertEquals

```
import org.junit.Test

import org.junit.runner.RunWith

/**

*Instrumented test, which will execute on an Android device.

*

*See [testing documentation](http://d.android.com/tools/testing).

*/

@RunWith(AndroidJUnit4::class)

class ExampleInstrumentedTest (

@Test

 fun useAppContext() {

  //Content of the app under test.

    Val appContext= InstrumentationRegistry.getInstrumentation().targetContext
assertEquals("hackon.lifetime.shopon", appContext.packageName)

}

}
```

ExampleUnitTest.kt

```
package hackon.lifetime.shopon

import org.junit.Assert.assertEquals

import org.junit.Test

/**

*Example local unit test, which will execute on the development machine(host).

*

* See [testing documentation](http://d.android.com/tools/testing).
```

```
*/
class ExampleUnitTest {
  @Test
  fun addition_isCorrect() {
  assertEquals(4, 2+2)
 }
}
```

ProductAdapter.kt

```
package hackon.lifetime.shopon.adapters
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.ImageView
import android.widget.TextView
import androidx.recyclerview.widget.DiffUtil
import androidx.recyclerview.widget.ListAdapter
import androidx.recyclerview.widget.RecyclerView
import hackon.lifetime.shopon.R
import hackon.lifetime.shopon.models.Product
class ProductAdapter(private val listener: (Product)->Unit):
ListAdapter<Product, ProductAdapter.ViewHolder>(DiffCallback()){
override fun onCreateViewHolder(
   parent:ViewGroup,
```

```
   viewType: Int
):ViewHolder (
val itemLayout = LayoutInflater.from(parent.context)
  .inflate(R.layout.list_item, parent, false)
  return ViewHolder(itemLayout)
}
Override fun onBindViewHolder(holder:ViewHolder,position:Int){
holder.bind(getItem(position))
}
inner class ViewHolder(containerView: View):
 RecyclerView ViewHolder(containerView) {
init {
  itemView.setOnClickListener {
  listener.invoke(getItem(adapterPosition))
}
}
Private val productImage: ImageView =
containerView.findViewById(R.id.product_image)
private val productName: TextView =
containerView.findViewById(R.id.product_name)
private val productPrice: TextView = containerView.findViewById(R.id.product_price)
private val productDelivery:
TextView=containerView.findViewById(R.id.product_delivery)
private val rating4: ImageView = containerView.findViewById(R.id.rating4)
Private val rating5: ImageView = containerView.findViewById(R.id.rating5)
```

```
private val productRatingCount:
TextView=containerView.findViewById(R.id.rating_count)
fun bind(country Data: Product) {
 with(countryData) {
 productImage.setImageResource(imageId)
 productName.text = name
 productPrice.text = price
 productDelivery.text = delivery
  if (rating <= 4) rating5.setImageResource(R.drawable.ic_baseline_star_outline_24)
  if (rating<4) rating4.setImageResource(R.drawable.ic_baseline_star_half_24)
  productRatingCount.text=ratingCount
}
}
}
}
class DiffCallback: DiffUtil. ItemCallback<Product>() {
 override fun areItemsTheSame(oldItem: Product, newItem: Product): Boolean {
  return oldItem.imageId==newItem.imageId
}
override fun areContentsTheSame(oldItem: Product, newItem: Product): Boolean {
 return oldItem.hashCode()==newItem.hashCode()
}
}
```

Detail Fragment.kt

```
package hackon.lifetime.shopon.fragments

import android.content.Intent
import  android.net.Uri
import android.os.Bundle
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.Toast
import android.appcompat.app.AppCompatDelegate
import android.fragment.app.Fragment
import hackon.lifetime.shopon.databinding.FragmentDetailBinding
import hackon.lifetime.shopon.models.Product
import hackon.lifetime.shopon.products

class Detail Fragment: Fragment() {
 private var_binding: FragmentDetailBinding? = null
 private val binding get() =_binding!!
override fun onCreateView(
 inflater.LayoutInflater, container: ViewGroup?,
 savedInstanceState: Bundle?
): View {
```

```
AppCompatDelegate.setDefaultNightMode(AppCompatDelegate.MODE_NIGHT_NO)
_binding = FragmentDetailBinding.inflate(inflater, container, false)
return binding.root
}
override fun onViewCreated(view: View, savedInstanceState: Bundle?) {
 var product: Product? = null
 arguments?.let { it ->
 val args = DetailFragmentArgs.fromBundle(it)
 product = products.find { args.id == it.id }
}
product?.let {
 with(it) {
 binding.productName.text = name
 binding.productPrice.text = price
 binding.productFullDescription.text=longDescription
 binding productImage.setImageResource(imageId)
 binding virtual.setOnClickListener {
 val sceneViewerIntent = Intent(Intent.ACTION_VIEW)
 val intentUri =
 Uri.parse("https://arvr.google.com/scene-viewer/1.0").buildUpon)
 .appendQueryParameter("file", modelURL)
 .appendQueryParameter("mode", "ar_only")
 .appendQueryParameter("resizable", "false")
```

```
 .appendQuery Parameter("title", "$name - $price")
 .build()
sceneViewerIntent.data = intentUri
sceneViewerIntent.setPackage("com.google.ar.core")
startActivity(sceneViewerIntent)
}
binding.addToCart.setOnClickListener {
 Toast.makeText(context, "Product added to cart!",

Toast.LENGTH_SHORT).show()
}
binding buyNow.setOnClickListener {
 Toast.makeText( context, "Thank-you for ordering this product!",
 Toast.LENGTH_SHORT
).show()
}
}
}
}
}
```

ListFragment.kt

```
package hackon.lifetime.shopon.fragments
import android.os.Bundle
```

```
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import androidx.fragment.app.Fragment
import androidx.navigation.fragment.findNavController
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView
import hackon.lifetime.shopon.R
import hackon.lifetime.shopon.adapters.ProductAdapter
import hackon.lifetime.shopon.products

class ListFragment: Fragment() {
 override fun onCreateView(
 inflater: LayoutInflater, container: ViewGroup?,
 savedInstanceState: Bundle?
): View? = inflater.inflate(R.layout.fragment_list, container, false)

override fun onViewCreated(view: View, savedInstanceState: Bundle?) {
 super.onViewCreated(view, savedInstanceState)
 val productList = view.findViewById<RecyclerView>(R.id.product_list).apply {
  layoutManager = LinearLayoutManager(activity)
  adapter = Product Adapter {
  findNavController().navigate(ListFragmentDirections.actionHomeToDetail(it id))
```

```
}
setHasFixedSize(true)
}
(productList.adapter as ProductAdapter).submitList(products)
}
}
```

Product.kt

```
package hackon.lifetime.shopon.models
data class Product
 (
  val id: Int,
  val name: String,
  val price: String,
  val imageId:  Int,
  val delivery: String,
  val longDescription: String,
  val rating: Float,
  val ratingCount: String,
  val modelURL: String
)
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
```

```
 xmlns:tools="http://schemas.android.com/tools"
 package="hackon.lifetime.shopon">
<application
 android:allowBackup="true"
 android dataExtraction Rules="@xml/data_extraction_rules"
 android:fullBackupContent="@xml/backup_rules"
 android:icon="@mipmap/ic_launcher"
 android:label="@string/app_name"
 android:roundIcon="@mipmap/ic_launcher_round"
 android:supportsRtl="true"
 android:theme="@style/Theme.ShopOn"
 tools:targetApi="31">
 <activity
  android:name=".MainActivity"
  android:exported="true":
  <intent-filter>
    <action android:name="android.intent.action.MAIN" />
    <category android:name="android.intent.category.LAUNCHER" />
  </intent-filter>
 </activity>
</application>
</manit>
```

8.TESTING

8.1 WHITE BOX :

White box refers to a shopping experience where consumers engage with a virtual or augmented reality interface displayed on a white box, which could be a screen or a projection surface. white box combines elements of virtual and augmented reality with e-commerce functionality to create an immersive and engaging shopping experience for consumers. It bridges the gap between online and offline retail, offering the convenience of e-commerce with the sensory experience of physical shopping.

8.2 BLACK BOX :

Black box refers to a shopping experience where consumers engage with a virtual or augmented reality interface displayed on a black box, which could be a screen or a projection surface. While similar to interactive shopping on a white box, there might be some differences in the presentation and ambiance . A black box setting could evoke a different atmosphere, potentially emphasizing a sleek and modern feel or enhancing the contrast for better visual effects.

8.3 UNIT TEST:

"Interactive shopping using augmented reality (AR)" refers to a modern approach in e-commerce where customers can virtually try products before making a purchase. This is typically done by overlaying digital images of products onto the real world using AR technology. For example, customers could use their smartphones or AR glasses to see how furniture would look in their home or how clothing would fit on their body.When you mention "unit test" in this context, it likely means testing individual components or functions of the software that enables this AR shopping experience

8.4 TEST CASE :

S.NO	TESTNAME	INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT	STATUS
1	Detection of plain	Moving the device to defect the plain	Plain detection properly	It is success plain is detected	SUCCESS
2	Accessing 3D model	Accessing the 3D model from shopon	3D model accessing	3D model is accessed for the user	SUCCESS
3	Overlying 3D model	Confirm the location &place	Confirm the place	Confirm the place	SUCCESS
4	Displaying interacting on mobile screen	Display the 3D model on the mobile which is at the location	3D model which is placed on the location must display	3D model displayed on device successfully	SUCCESS

9. OUTPUT SCREENS

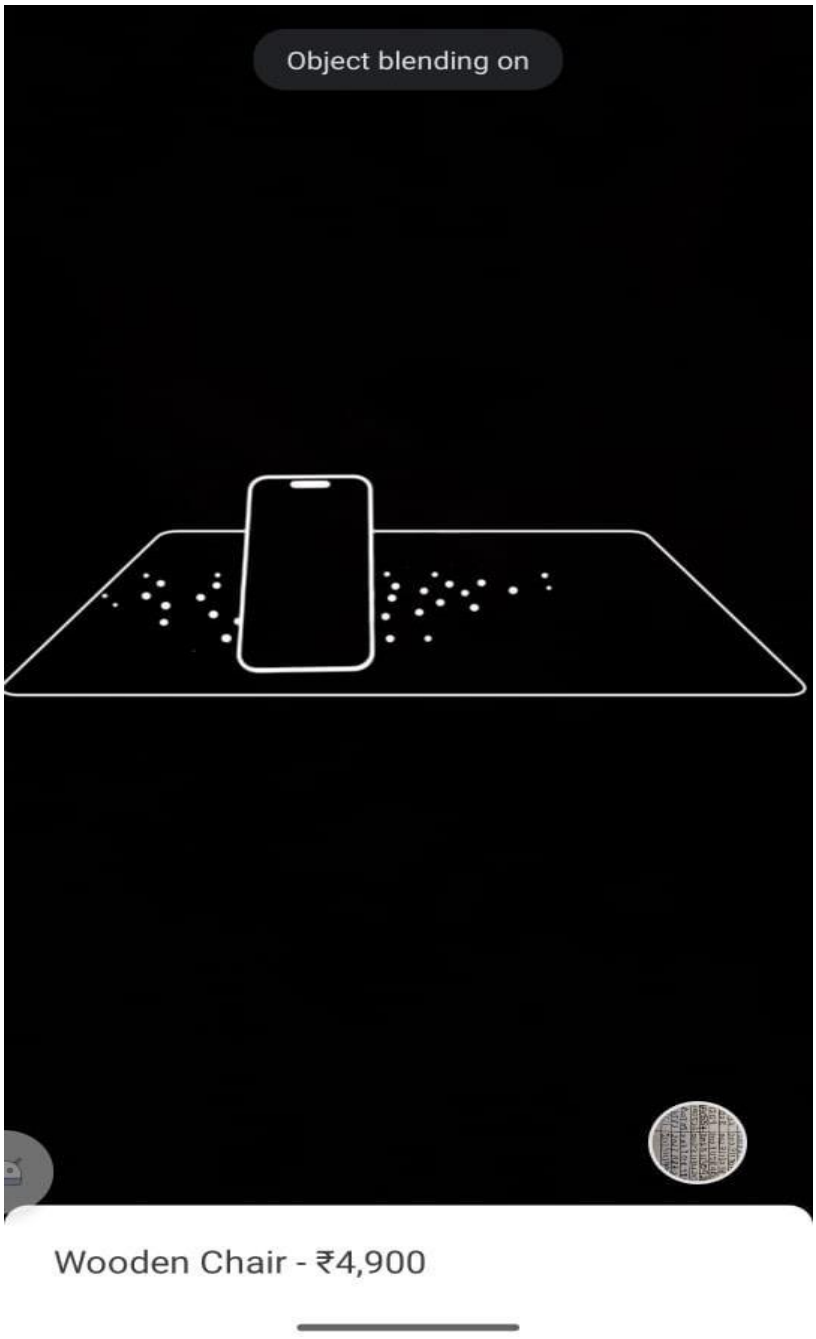

FIG NO. 9.1 PLAIN DETECTION

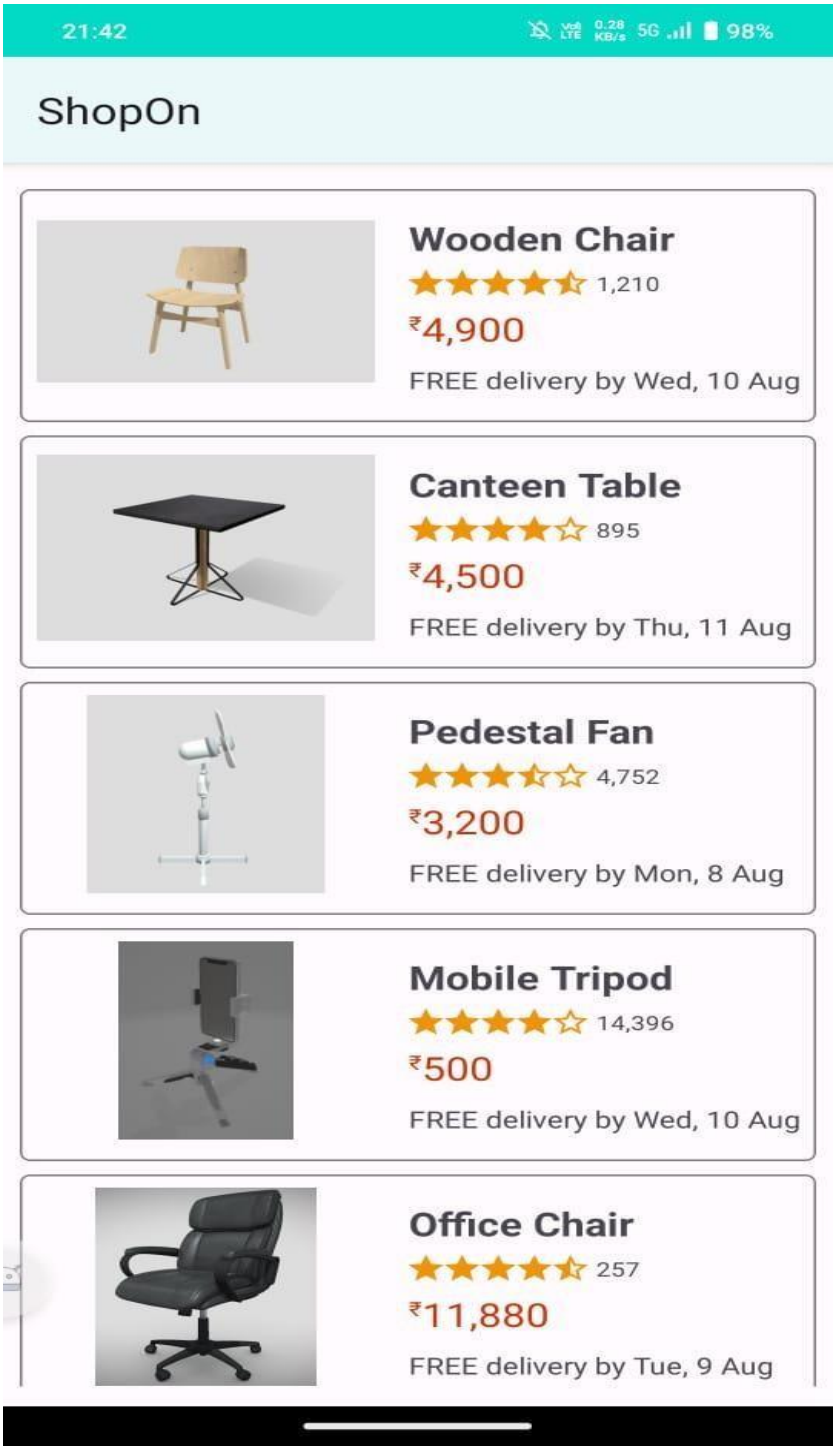

FIG NO. 9.2 MENU

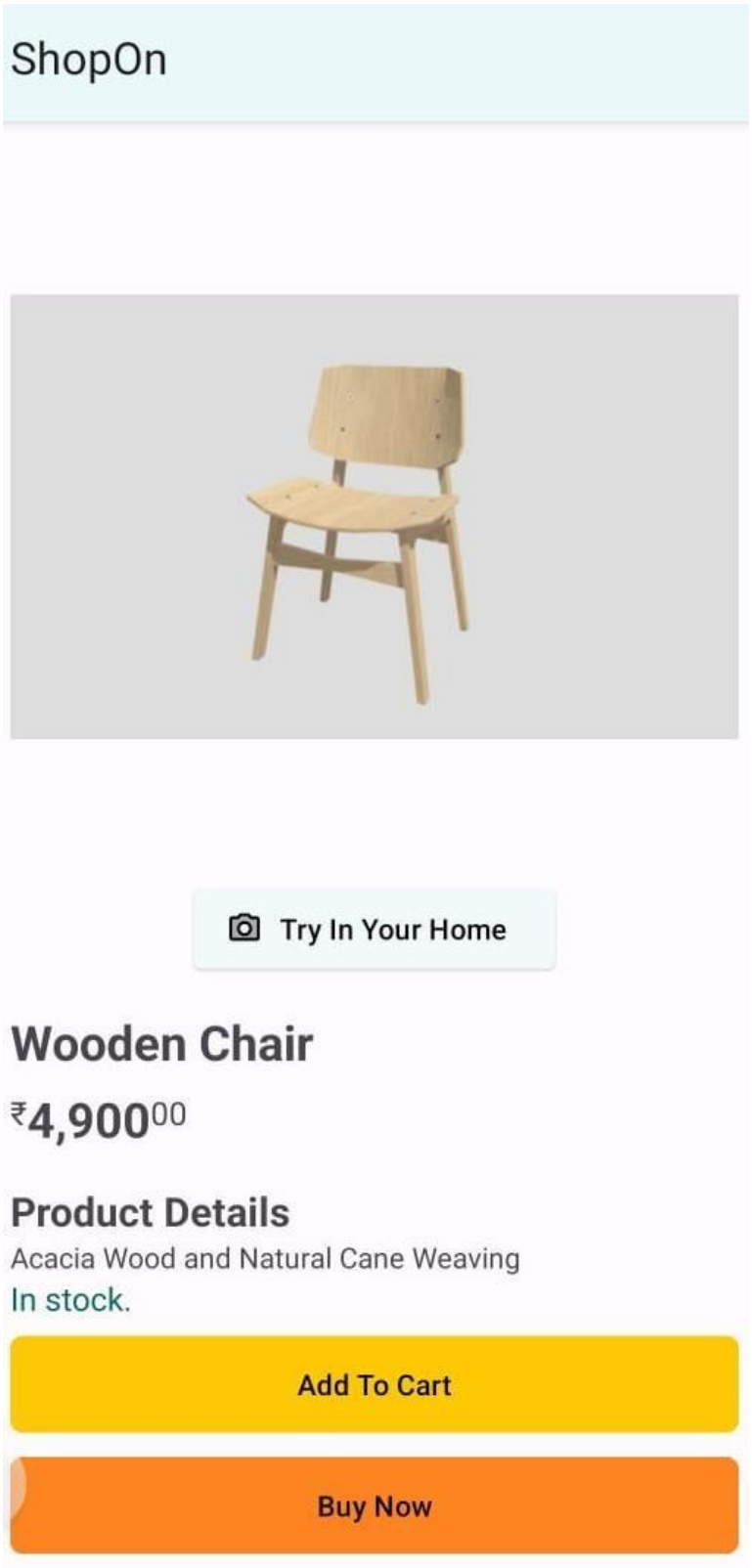

FIG NO. 9.3 WOODEN CHAIR

FIG NO. 9.4 AR WOODEN CHAIR IN OPEN PLACE

FIG NO. 9.5 AR MOBILE TRIPOD IN OPEN PLACE

10.CONCLUSION

Augmented reality (AR) technology has the potential to revolutionize the way we learn and shop. It has the ability to create an immersive and interactive experience that can enhance learning outcomes and provide personalized shopping experiences. However, the successful implementation of AR technology depends on several factors, including the availability of specialized hardware and software, the cost of implementation, and the requirement for proper training and support.

One of the most significant potential benefits of using AR technology in education is the ability to create an interactive and engaging learning environment. AR technology can lectures, making it easier to understand complex concepts and engage with the material outcomes, including better retention of information and increased student engagement. Similarly, AR technology can also provide a more personalized shopping experience for customers. AR technology can enable customers to visualize products ina real-world environment, helping them to make more informed purchasing decisions. Customers can also use AR technology to try on virtual clothing or see how furniture might look in their home, providing a more personalized shopping experience that can increase customer satisfaction and loyalty.

Despite the potential benefits of AR technology, there are also some challenges that must be addressed. One of the primary challenges is the availability of specialized hardware and software. AR technology requires specialized devices, such as AR glasses or smart phones, that are capable of displaying augmented reality content. Additionally, AR software development requires specialized knowledge and expertise, which can increase the cost of implementation.

11. FURTHER ENHANCEMENTS

The future scope of interactive shopping using augmented reality is vast and exciting. As the technology continues to evolve and become more sophisticated, there are a number of potential applications and advancements that could be realized, including:

1. **Increased personalization:** AR technology could be used to create highly personalized shopping experiences, where customers can visualize products in their homes or try on clothes virtually to see how they look.
2. **Enhanced social shopping:** AR technology could be used to create more immersive social shopping experiences, where customers can shop with friends or family members in a virtual environment.
3. **Improved accessibility:** AR technology could be used to make shopping more accessible for people with disabilities or other special needs, by providing additional sensory input or visual aids.
4. **Seamless integration with online shopping:** AR technology could be seamlessly integrated with online shopping platforms, allowing customers to experience products virtually before making a purchase.
5. **Enhanced customer engagement:** AR technology could be used to create more engaging and interactive shopping experiences, increasing customer engagement and loyalty.
6. **Integration with other technologies:** AR technology could be integrated with other emerging technologies, such as artificial intelligence and the Internet of Things, to create even more advanced and sophisticated shopping experiences.

Overall, the future of interactive shopping using augmented reality is bright and full of possibilities. As the technology continues to evolve and become more accessible, we can expect to see even more exciting and innovative applications of AR technology in the retail industry.

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