

# **AUGMENTED COSTUME CHANGER**

**[CS16-65]**

**BY**

**AIMAN ASAD [01-134132-019]**

**FARAN MUNIR [01-134132-045]**

**SUPERVISED BY**

**DR. MUHAMMAD MUZAMMAL**



**2016-2017**

A Report submitted to the Department of Computer Science,

Bahria University, Islamabad.

In partial fulfillment of the requirement for the degree of BS (CS)

# Certificate

We accept the work contained in this report as a confirmation to the required standard for the partial fulfillment of the degree of BS (CS).

---

Head of Department

---

Supervisor

---

Internal Examiner

---

External Examiner

# Dedication

We would like to dedicate this project to our beloved parents who have been a constant support and encouragement. Their motivation, inspiration and belief in us have made us push to our limits and aim to aspire a lot more in life.

# **Acknowledgements**

We are indebted to Almighty Allah, Lord of the Universe and His Holy Prophet (PBUH) whose blessings enabled us to perceive and pursuit higher ideas in life and gave us the strength to complete this project.

We extend our deepest gratitude and to our project supervisor, Dr. Muzammal, who remained a source of inspiration and motivation for us through the course of the project. His guidance and support helped us complete our project on time.

# **Abstract**

This project implements a real time augmented costume changer on user image using a mobile application using a android device. The basic feature of augmented costume changer is that the user would be able to customize his/her image with predefined costumes. Then a sample of costumes would be rendered on the user image and user can save the customized image in smart phone activity to see whether the selected costumes suits the user or not and make it easy for user to finalize the costume in less time. The report consists of the reviews of the existing dressing rooms and how this system is different from them and contain all the software requirement specifications of the proposed system. Further, the report describes the architecture of the system, and the design techniques. The report also consists of the test report that were performed on the system to see its usability and the review how the system performed against the tests. The main objective of the project is to improve user's shopping experiences, so that they would not have to spend time on queuing up for in-store dressing rooms to be vacated.

# Table of Contents

Title Page .....	i
Certificate .....	ii
Dedication .....	iii
Acknowledgement .....	iv
Abstract.....	v
Table of Contents .....	vi
List of Figures.....	viii
List of Table.....	viii
INTRODUCTION.....	ix
1.1 Project Background.....	10
1.2 Motivation.....	10
1.3 Project Objectives .....	11
1.4 Project Scope .....	11
1.5 Report Organization.....	11
LITERATURE REVIEW .....	12
2.1 Virtual Reality System.....	13
2.1.1 Styliff.....	13
2.1.2 Zugarra.....	13
2.1.3 Fit Your.....	14
2.1.2 Fitiquette.....	14
2.2 Limitation in Existing Application .....	15
2.3 Types of Reality.....	15
2.3.1 Virtual Reality.....	15
2.3.2 Augmented Reality.....	15
2.3.3 Hybrid Reality.....	16
2.4 Augmented Costume Changer.....	16
REQUIREMENT SPECIFICATIONS.....	17
3.1 Augmented Costume Changer.....	18
3.2 Requirement Specifications.....	18
3.2.1 Functional Requirements .....	18
3.2.2 Non Functional Requirements .....	19
3.3 Use Cases.....	20
3.3.1 Locate User .....	20
3.3.2 Customize User Image.....	22
3.3.3 Costume Rendering .....	24
3.3.4 Comparison .....	26
SYSTEM DESIGN.....	28
4.1 System Architecture.....	29
4.2 Class Diagram .....	30
4.3 Design Methodology.....	31
4.3.1 Initiate Application .....	31

4.3.2 Locate user.....	32
4.3.3 View Costume.....	33
4.3.4 Costume Rendering on User Image.....	34
4.3.5 Comparison of Costumes .....	35
4.4 User Interface Design .....	35
4.5 System Architecture.....	37
4.5.1 Data Flow Diagram(0 Level).....	37
4.5.2 Data Flow Diagram(1 Level).....	38
SYSTEM IMPLEMENTATION .....	39
5.1 Development Environment .....	40
5.1.1 Open CV .....	40
5.1.2 Android Studio .....	40
5.1.3 Adobe photo shop.....	41
5.1.4 Apache Cordova.....	41
SYSTEM TESTING .....	45
6.1 Installation Testing .....	46
6.2 Graphical User Interface Testing.....	47
6.3 Usability Testing.....	48
6.4 Compatibility Testing .....	49
CONCLUSION .....	50
7.1 Conclusion .....	51
7.2 Future Direction.....	51
REFERENCES.....	52
Appendix A.....	53
User Manual .....	53

# List of Figures

Figure 2.1-1 Styliff .....	13
Figure 2.1-2 Zugara .....	14
Figure 2.1-3 Fit Your .....	14
Figure 2.1-4 Fitiquette .....	15
Figure 2.3 Types of Reality .....	16
Figure 3.3-1 Locate user image.....	20
Figure 3.3-2 Customize user image .....	22
Figure 3.3-3 Costume rendering.....	24
Figure 3.3-4 Comparison.....	26
Figure 4.1 System Architecture .....	29
Figure 4.2 Class Diagram .....	30
Figure 4.3-1 Initiate Application .....	31
Figure 4.3-2 Locate/Detect user image.....	32
Figure 4.3-3 View costumes.....	33
Figure 4.3-4 Costume rendering on the user .....	34
Figure 4.3-5 Comparison of costumes.....	33
Figure 4.4 User Interface Design .....	36
Figure 4.5-1 DFD 0 Level .....	37
Figure 4.5-2 DFD 1 Level .....	38
Figure 5.1-1 Open CV .....	40
Figure 5.1-3 Adobe Photo-shop.....	41



# **CHAPTER 1**

# **INTRODUCTION**

## 1.1 Project Background

Shopping allows customers to directly buy goods from both online and shopping stores. Customers find a product of interest by visiting the stores. They make purchase in order to satisfy their needs. Shopping for outfits is a common everyday action both in stocks and online. In stores we try some looked-for outfits and inspect how well they suit while using online shopping we check how thriving the outfits fit on the fits mockups on the online snapshot. In the review of these two shopping stages we came to know that shopping choices have many boundaries and imperfections.

In shopping stores customer needs to stab outfits in dressing room which takes a lot of time and some time they feel scratchy while using fitting rooms and in online shopping stores the clothes are not manageable to the consumers so it is impossible for the customers to physically try on the outfits on themselves until the items are supplied. So while using online stores more chances are that customers are going to unused their money by ordering mistaken outfits according to their fitness.

The project is a “Augmented costume changer” as android application that would benefit the customers to choose the outfits that appearances best them. By this costumers would be able to notice the visual image of how they will aspects like after trying on clothes. It will diminish the manual doings and also save customer’s money and time.

## 1.2 Motivation

Now a day’s user have to visit different malls, markets and brand outlets in search of their desired wearable’s like clothes (shirt or trouser etc.) and waste a lot of time in doing such activities and get tired in all these findings and they got confusion in selecting the right costume for them and waste money sometime and also it feels uncomfortable for them in using fitting/dressing room because of some security and privacy issues and some people want to try out hundreds of new clothes (shirts, trousers etc.) and styles without even going to stores fitting/changing room. Due to manual system in use the process tends to slow so this application will eliminate all these manual doings and increase the speed of the whole process and make it reliable for customer to get satisfy about their costumes while sitting in their own house or anywhere they want to use the application for their need. It will help user to decide in real time.

Through this application user will select the costumes (shirts, trousers) by clicking on them and costume (shirts, trousers) will appear on the user body which will help the user in choosing the right costume for them. It will work as an android application which can be easily accessed by users in order to fulfill their shopping need.

## **1.3 Project Objectives**

To develop an Augmented Android Application which will help users to decide what type of costumes looks good and suits them best and helps in saving money and time.

## **1.4 Project Scope**

The main area of our interest will mainly focus on developing a (AR android application) which will facilitate the customer to decide what type of costumes suits them best and make them able to save money by knowing before buying clothes like shirts, trousers etc. how they going to look on them and provide better idea whether to buy item or leave it. This will sure you don't regret their purchase and customer also get new idea what clothing trends will look good on them and make it reliable for customer to get satisfy about their costumes. It will help user to decide in real time. Our application will only restrict to change the costumes on some object (human being). The application will have a user friendly interface with easy navigation even for those who are not much familiar with android and touch screen. One can try clothes 24/7 in the comfort of being in own home.

## **1.5 Report Organization**

The rest of this report is structured as follow:

1. Chapter 2 is about Literature Review.
2. Chapter 3 is about requirement specification.
3. Chapter 4 is about system design
4. Chapter 5 is about system implementation
5. Chapter 6 is about system testing
6. Chapter 7 is about conclusions

# **CHAPTER 2**

# **LITERATURE**

## 2.1 Virtual Reality System

This concept of augmented costume changer is new but a lot of work has been done on virtual fitting room's .It all totally virtual. The concept of virtual fitting rooms has been implemented on various platforms using different technologies 2d graphics, visualization and dummies. We can say that virtual reality is an non-natural atmosphere that is generated with software and presented to user in such a way that the user appends belief and admits it is a real atmosphere. Examples of virtual reality system are as follows

### 2.1.1 Styliff

Styliff is a virtual dressing app, which permits user to virtually try over 10,000 clothes and other accessories on their pre scanned bodies, share their customized outfits with friends, socialize with fashion community and finally purchase the item they like. Styliff is your virtual dressing room-shop and your private stylist. [1]



*Figure 2.1-1 Styliff*

### 2.1.2 Zugara

Zugara has virtual dressing area technology enhanced for numerous marketing channels. Our software works with consistent webcams and Kinect, although also present tablet integration for our Kiosk software. Social sharing and analytics are essential to all of our virtual dressing room technologies to support growth purchase intent. [2]



Figure 2.1-2 Zugara

### 2.1.3 Fit-Your

Fit Your is giving an support to shoppers to visualize themselves trying on a diversity of clothes and outfits virtually without resorting to any physical means for the same. This individual online machine allows clients to know-how a very innovative shopping. Goods such as dresses, footwear products, wristwatch and many other trappings can be strained on using this software. It then makes online shoppers glad as they are providing such a appropriate shopping model – a rare sight to capability earlier. [3]



Figure 2.1-3 Fit-Your

### 2.1.4 Fitiquette

Fitiquette is virtual dressing app, their mockups work by controlling you through the creation of a modified virtual dummy that precisely look like your own dimension. They can then propose clothes that would fit, showing you a 360 outlook of how the dress will move and drape in actual life. They don't propose sizing. They just let you stab dress on like in a real changing area and you can select. There's no endeavor to put clothing on the real photo of the purchaser. It's all totally simulated. Most significantly, there have been no revenues from sale made so far-off. [4]

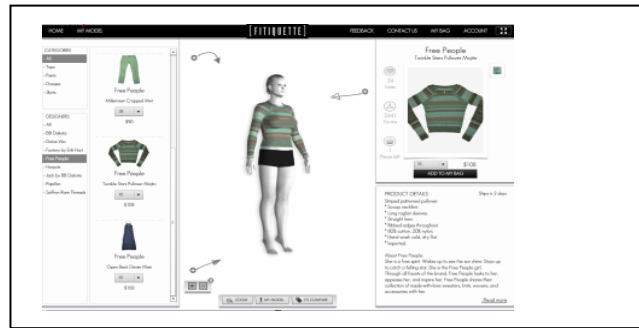


Figure 2.1-4 Fitiquette

## 2.2 Limitations in Existing Applications

Existing applications are all fundamentally virtual dressing apps. They allow users to try over costumes virtually, not physically. Existing applications don't use the real image of the user; they apply outfits on dummies. But our Android application applies outfits on the real image of the user, not on the dummies, so the user can decide the best outfits for her/him. Existing applications need all body dimensions for his/her 3D avatar to virtually try on clothes. Existing applications have not much additional user-friendly interface with easy navigation.

## 2.3 Types of Reality

There are many categories of reality systems; we have only discussed some illustrative types.

### 2.3.1 Virtual Reality

Virtual reality (VR) is a computer expertise that uses virtual reality headsets, occasionally in combination with physical spaces or multi-projected atmospheres, to produce representative images, sounds, and other senses that pretend a user's physical existence in a virtual or invented atmosphere. An individual using a virtual reality kit is able to "look around" the synthetic world, and with extraordinary quality VR transfer around in it and relate with virtual types or articles.

### 2.3.2 Augmented Reality

Augmented reality (AR) is a living direct or indirect vision of a physical, real-world atmosphere whose fundamentals are "augmented" by computer-produced or mined real-world sensory contribution such as sound, audiovisual, graphics, or GPS facts. It is linked to a more general concept called computer-intervened reality, in which a vision of realism

is reformed (possibly even diminished rather than augmented) by a computer. Augmented reality improves one's current observation of reality.

### 2.3.3 Hybrid Reality

Hybrid Reality sometimes stated to as “mixed reality”. It is the reunion of real and virtual worlds to yield new atmosphere and visualizations where physical and cardinal stuffs co-exist and relate in actual period. Hybrid reality takes place not only in the physical world or the virtual world, but is a mixture of reality and virtual reality, surrounding equally augmented reality and augmented virtuality via immersive technology.

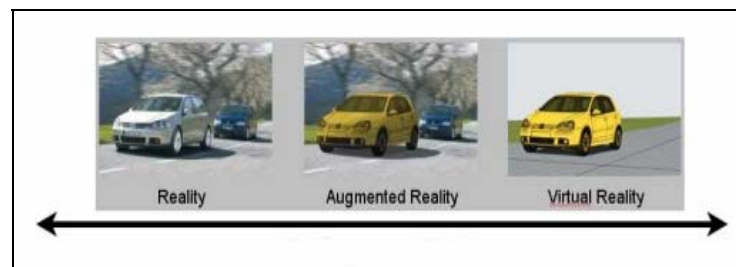


Figure 2.3 Types of Reality

## 2.4 Augmented Costume Changer

We anticipated augmented costume changer enthused by the remarkable growth of mobile application advancement, As technology is advancing, we ripen an android application that will render the selected clothes and applied it on the image of the user so that they can save time and money and reduce manual doings

The ‘Augmented Reality’ (AR) is a live revelation of a physical, real-world atmosphere whose fundamentals are supplemented by computer-produced digital content. The basic goal of AR is to enhance and supplement the real world's atmosphere with digital 2D/3D Content. Our android application is based on marker based augmented reality.

The downside of the above mentioned system is that they are manageable only to a specific place. It is quite uncommon for every person to have a sensor device whenever there is a need of buying clothes. But our application is android augmented application, now days smart phone are common in use and reasonable by every person so this android based application will contain more fulfilment level than the previous one as it is real time based application.



Our android application will apply costumes on the real image of the user not on the dummies so the user can decide what type of costume suits him/her best by avoiding manual doings.

# **CHAPTER 3**

## **REQUIREMENT**

### **SPECIFICATION**

Existing system allows shopper to try on clothes to check one or more size, fit or style but virtually relatively than physically. This concept of augmented costume changer is new but a lot of work has been prepared on virtual fitting room's .It all totally virtual. The concept of virtual fitting places has been applied on numerous platforms using diverse technologies 2d graphics, visualization and dummies. We can say that virtual reality is a mock atmosphere that is formed with software and accessible to user in such a way that the user swings belief and admits it is a actual atmosphere. The collective feature about the remaining system is that they all render the 2D avatar of the consumer in which it is not possible to see the tried on clothes from every direction or color. Fit your is a sample of the existing system providing an assistance to buyers to visualize themselves nearly deprived of give back to any physical funds for the same.

### **3.1 Augmented Costume Changer**

The proposed system uses the real image of the user whereas none of the existing systems uses real image of the user. The main area of our interest will mainly focus on developing a AR android application which will facilitate the customer to decide what type of costumes suits them best and make them able to save money by knowing before buying clothes like shirts, trousers etc. how they going to look on them and provide better idea whether to buy item or leave it. The proposed system is about an android application that will render the chosen garments or clothing on the virtual 3D pictures of the client. The applications will have an easy to use interface with simple navigations for the individual who are very little acquainted with android and touch screen.

### **3.2 Requirement Specifications**

#### **3.2.1 Functional Requirements**

**FR01:** Application opens up the camera view.

**FR02:** Camera points towards the user and detect the user efficiently.

**FR03:** User can easily switch between front and back camera mode by tapping on switching icon

**FR04:** User select the gender displayed by side of the application.

**FR05:** Costumes are available based on Gender selection.

- FR06:** Costumes contains pants, shirts and trousers for both male and female.
- FR07:** When Costume is selected it will fit on user.
- FR08:** The android application saves the customized user image in smart phone activity.
- FR09:** Smart phone activity contains customized user images for comparison.
- FR10:** The Application renders the costumes on the user physically not virtually.

### 3.2.2 Nonfunctional requirements

**Performance:** Application should perform all functional requirements efficiently.

**Availability:** The application is available to all the users all time.

**Efficiency:** Application will ensure efficiency by providing fast solution to all the users.

**Usability:** All user must be satisfied with the product.

**Maintainability:** Application must isolate defects or maintain all the bugs and defects.

**Safety:** To operate without failure.

**Reliability:** Less bugs and errors and should have fault avoidance.

**Look and feel:** Costume should change seamlessly.

**Graphical user interface:** GUI is user friendly, easy to use and easy to remember.

### 3.3 Use Cases

#### 3.3.1 Locate/Detect user image

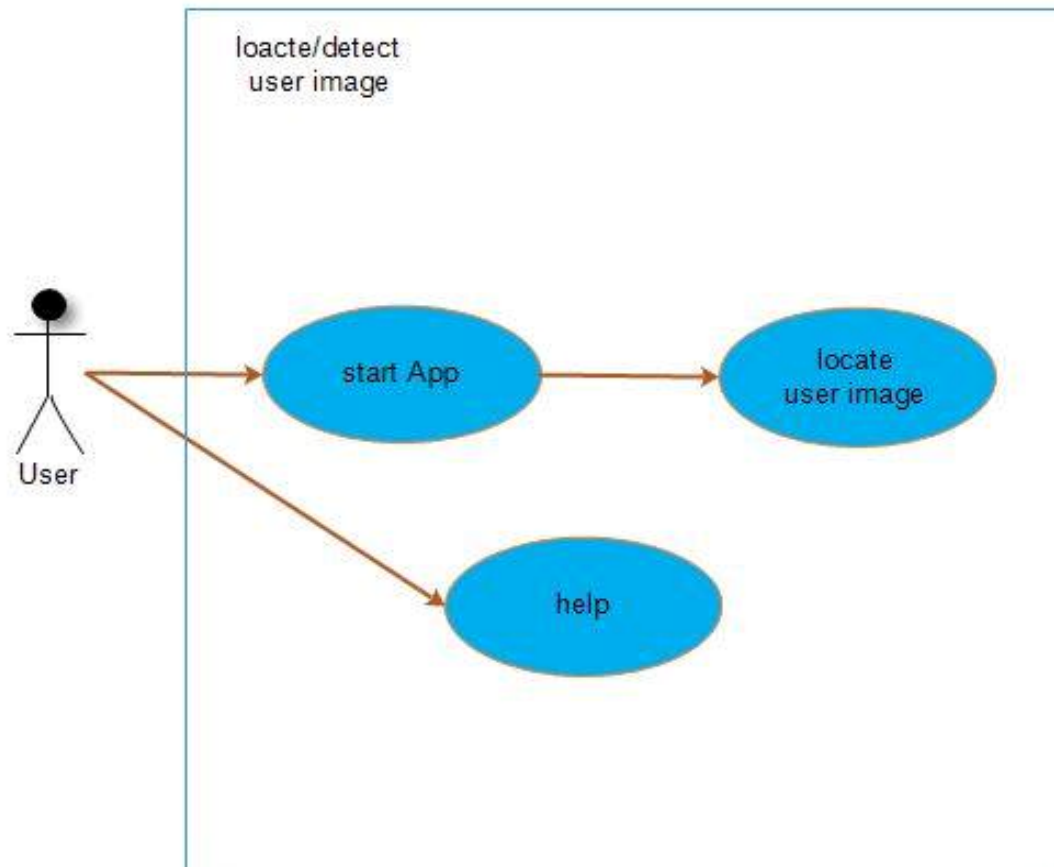


Figure 3.3-1 locate/detect user image

<b>Title</b>	detection	Req. id	FR01 and FR02
<b>Version No.</b>	1.0		
<b>Actors</b>	User		
<b>Description</b>	This shows how the user will start or use this application		
<b>Trigger</b>	Start up the android application		
<b>Main Success Scenario</b>	<b>Step</b>	<b>Action</b>	
	1.	Locate user image	
<b>Alternate Flows</b>	<b>Step</b>	<b>Action</b>	
	1a.	Re-try	
<b>Special Requirements</b>	No		
<b>Assumptions</b>	Image is detected on the first try		
<b>Pre-conditions</b>	Android application should be running properly		
<b>Post-conditions</b>	Image of the user is detected		
<b>User interface</b>	Android OS		
<b>Business Rules</b>	None		
<b>Issues</b>	User image not detected		

*Table 3.3-1 locate user image*

### 3.3.2 Customize User Image

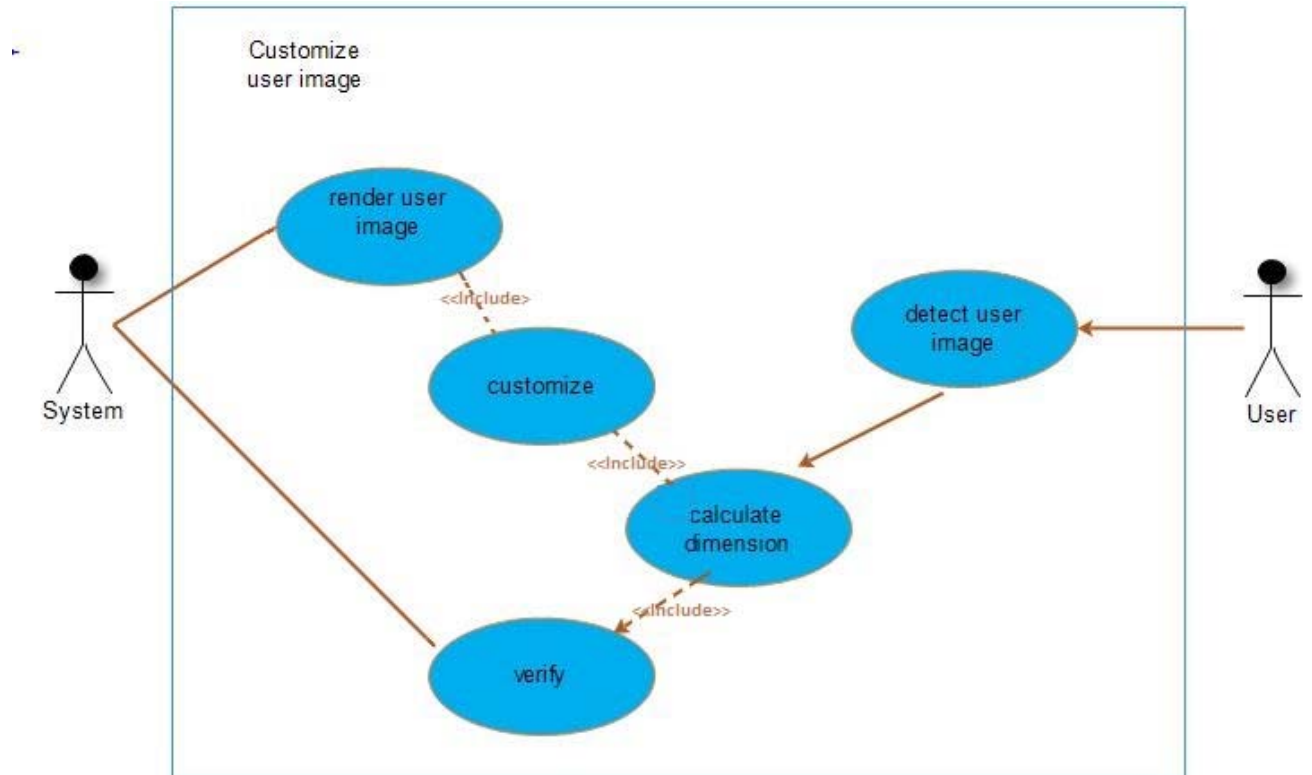


Figure 3.3-2 Customize user image

<b>Title</b>	<b>Customize User image</b>	Req. id	FR03 and FR04
<b>Version No.</b>	2.0		
<b>Actors</b>	System and User		
<b>Description</b>	This is the Use Case showing how system calculates dimensions.		
<b>Trigger</b>	Calculating user dimensions.		
<b>Main Success Scenario</b>	<b>Step</b>	<b>Action</b>	
	1.	Render user image	
	2.	Customization of image	
	3.	Calculation of dimensions	
<b>Alternate Flows</b>	<b>Step</b>	<b>Action</b>	
	1a.	reset	
	2a.	Re-try	
<b>Special Requirements</b>	No		
<b>Assumptions</b>	Dimensions could be random		
<b>Pre-conditions</b>	Image must have been rendered before		
<b>Post-conditions</b>	None		
<b>User interface</b>	3D UI on Android OS		
<b>Business Rules</b>	None		
<b>Issues</b>	Wrong dimensions are calculated by the system		

Table 3.3-2 Customize user image

### 3.3.3 Costume Rendering

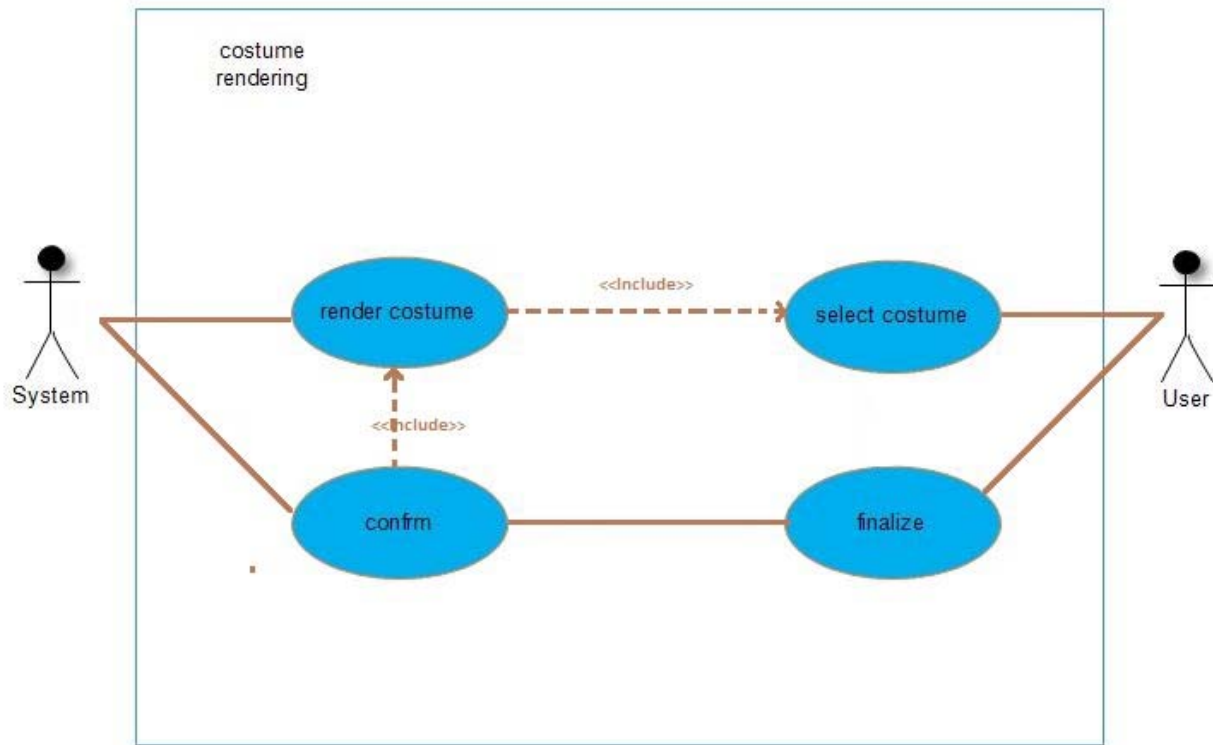


Figure 3.3-3 Costume rendering

<b>Title</b>	Costume rendering	Req. id	FR05 and FR06
<b>Version No.</b>	3.0		
<b>Actors</b>	System and User		
<b>Description</b>	This is the Use Case used rendering the clothes on the User.		
<b>Trigger</b>	User selects costume		
<b>Main Success Scenario</b>	<b>Step</b>	<b>Action</b>	
	1.	User selection of costume	
	2.	Rendering clothes on user	



	3.	Confirm the size of costume selected a. Fit b. Unfit
	4.	Finalize the outfit/costume
<b>Alternate Flows</b>	<b>Step</b>	<b>Action</b>
	1a.	Select other outfit
	2a.	Re-try the rendering
<b>Special Requirements</b>	3D costume for the user	
<b>Assumptions</b>	No Assumptions	
<b>Pre-conditions</b>	The size of the user fits on the user.	
<b>Post-conditions</b>	None	
<b>User interface</b>	3D UI on Android OS	
<b>Business Rules</b>	None	
<b>Issues</b>	Costume may not fit on the user because of size.	

*Table 3.3-3 Costume rendering*

### 3.3.4 Comparison

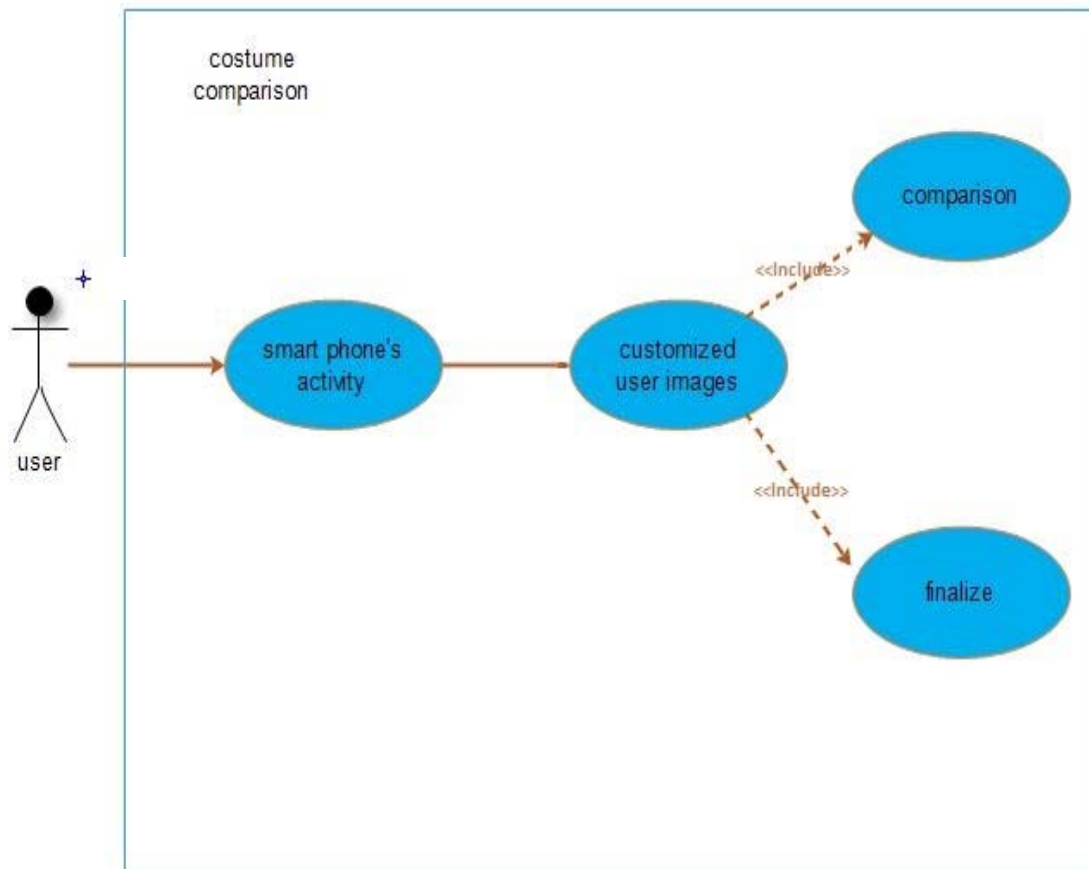


Table 3.3-4 comparison

<b>Title</b>	Comparison	Req. id	FR07
<b>Version No.</b>	4.0		
<b>Actors</b>	User		
<b>Description</b>	This use case shows comparison between three costumes		
<b>Trigger</b>	Start up the android application		
<b>Main Success Scenario</b>	<b>Step</b>	<b>Action</b>	
	1.	comparison	
<b>Alternate Flows</b>	<b>Step</b>	<b>Action</b>	
	1a.	Re-try	
<b>Special Requirements</b>	No		
<b>Assumptions</b>	Image is detected on the first try		
<b>Pre-conditions</b>	Android application should be running properly		
<b>Post-conditions</b>	Image of the user is detected		
<b>User interface</b>	Android OS		
<b>Business Rules</b>	None		
<b>Issues</b>	User image not saved		

*Table 3.3-4 comparison*

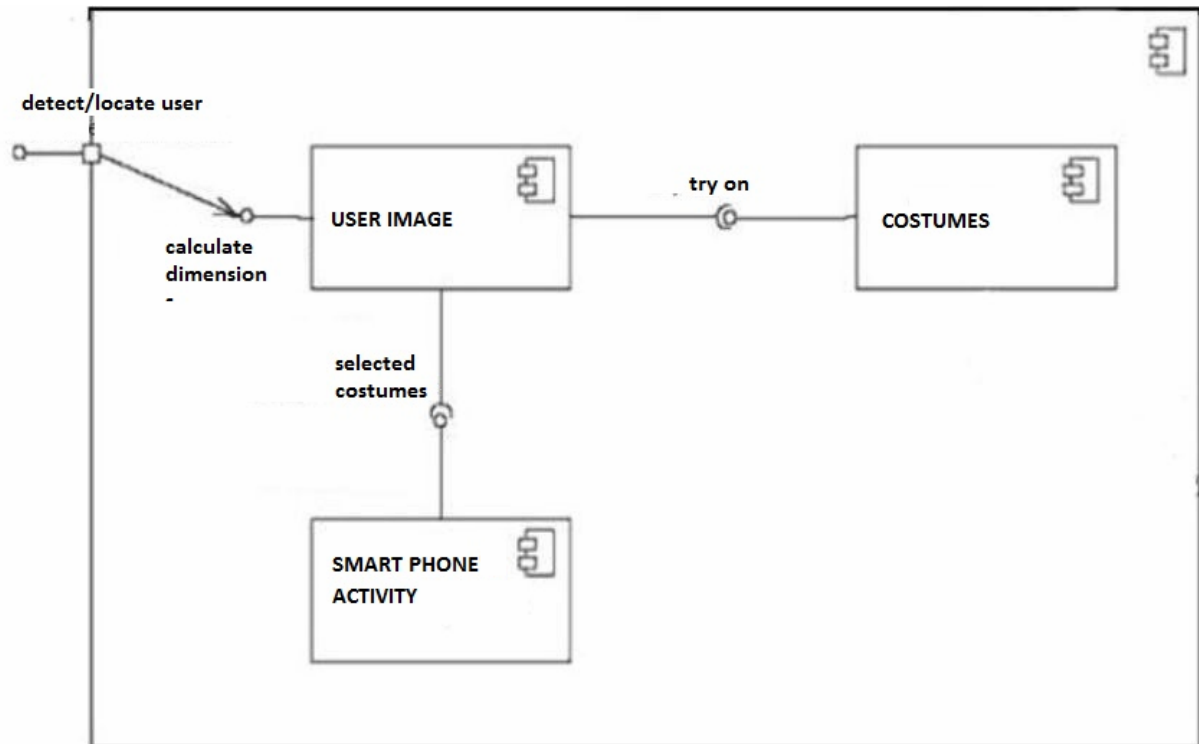
# **CHAPTER 4**

## **SYSTEM**

### **DESIGN**

## 4.1 System Architecture

The application opens up the camera view and the camera is pointed towards the user in order to calculate the dimension of the object. A list of costumes will be displayed by side of the application. The costume to be tried on is selected from the predefined costume list and finally the selected outfit is rendered on to the user image.



*Figure 4.1 system architecture*

The application will detect the user image so that the user image is customized with user's needs. Then the user will select the costume from the predefined list and the costume (shirt, trouser) will be rendered on the user. The final step of the application is to do a comparison of at most costumes.

## 4.2 CLASS DIAGRAM

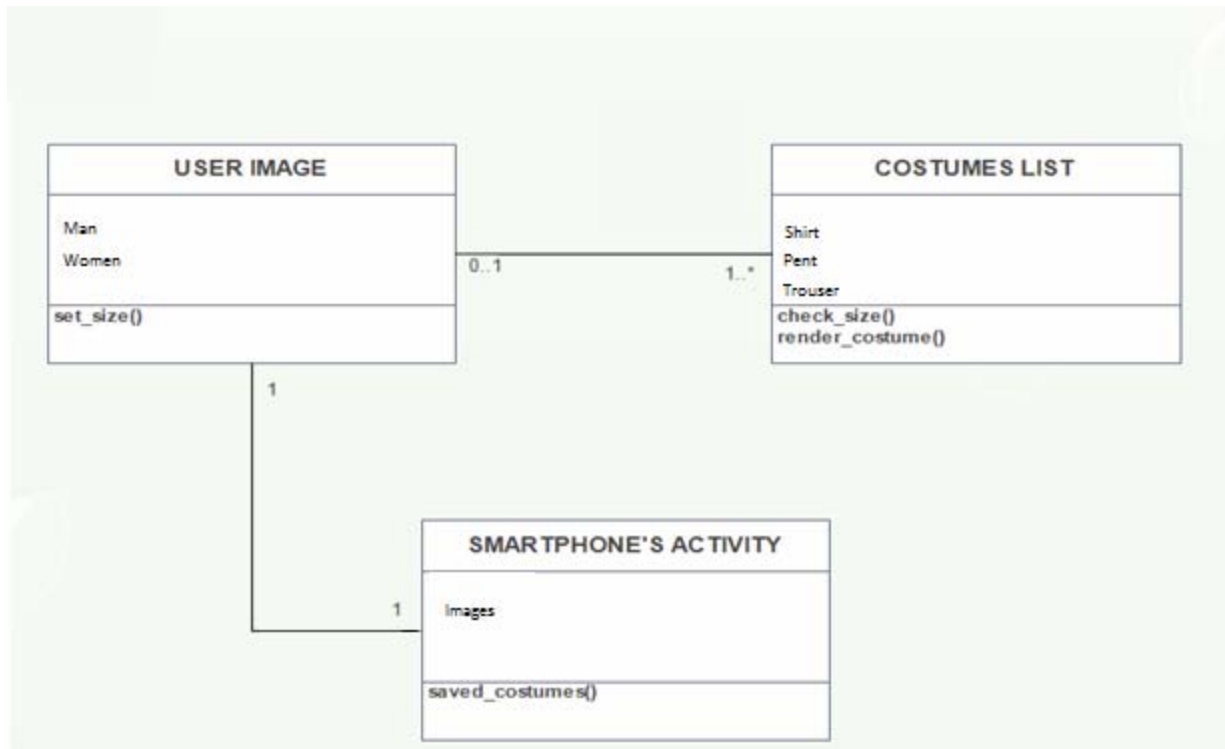


Figure 4.2 class diagram

When the user open the application it will detect the object or user image and calculate dimension of the object and then the user selects the costume and costumes would be rendered onto the user image. The final user image with the selected costumes will be saved in the smart's phone activity where the user can do comparison between the selected clothes. .

## 4.3 Design Methodology

### 4.3.1 Initiate Application

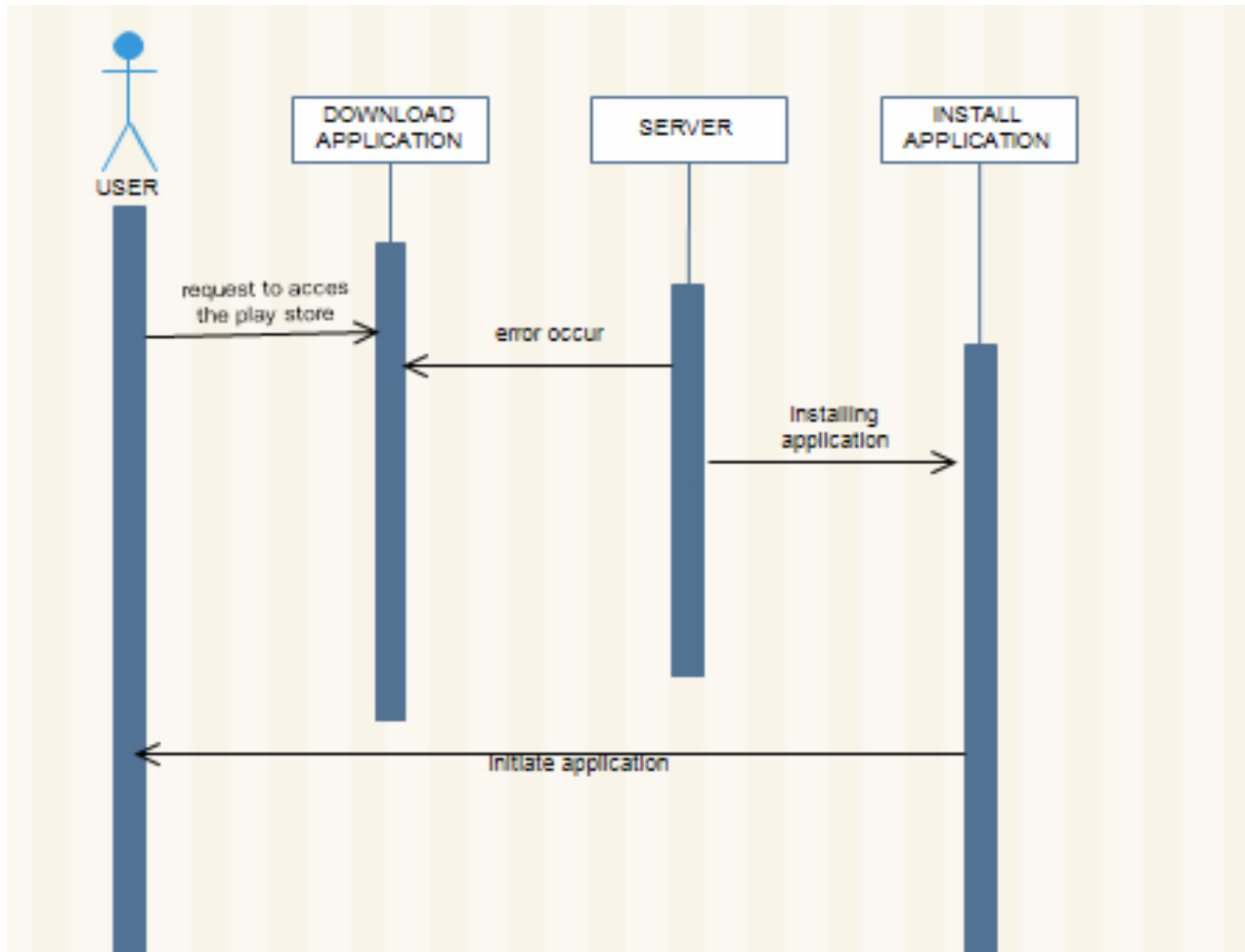


Figure 4.3-1 initiate application

The user/customer will first access the play store from its smart phone to download the application from the play store. The play store forward the user request to server in order to fetch the application if there is an error the request may be cancelled . After fetching the application the user will install the application on the smart phone.

### 4.3.2 Locate /Detect user image

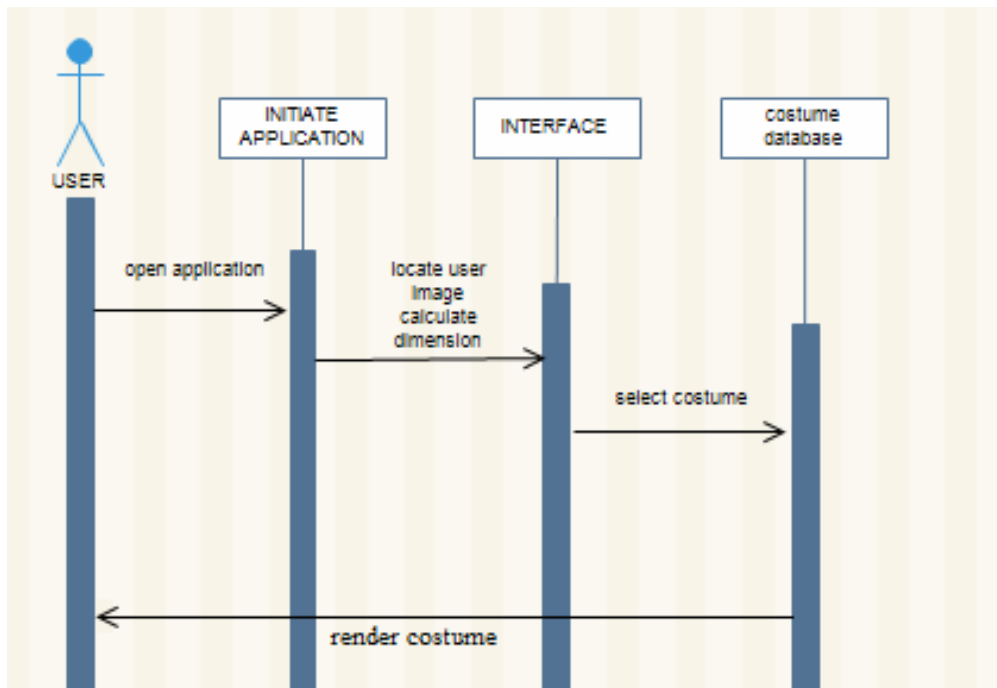


Figure 4.3-2 detect/locate user

When the user successfully installed the application it will start the application. The Application open the camera view which will locate the user image and calculate the dimension on the basis of the measurements user will select the desired costume from the costume database.



### 4.3.3 View Costumes

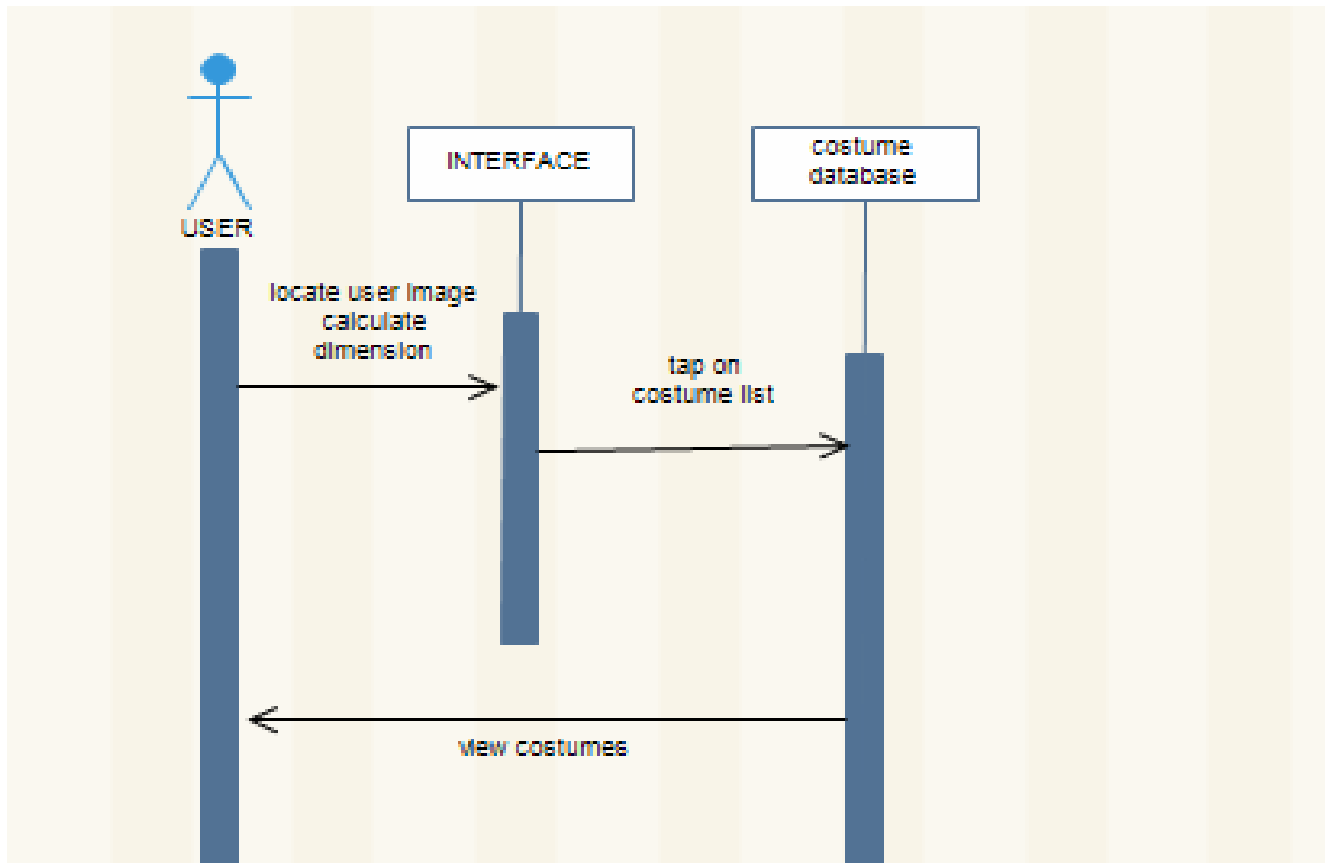


Figure 4.3-3 view costumes

After the detection/location of the user image the user will select the costume by tapping on the costume list which will be available on the side of the screen , selected costume will be rendered on the user image .

### 4.3.4 Costume Rendering on User Image

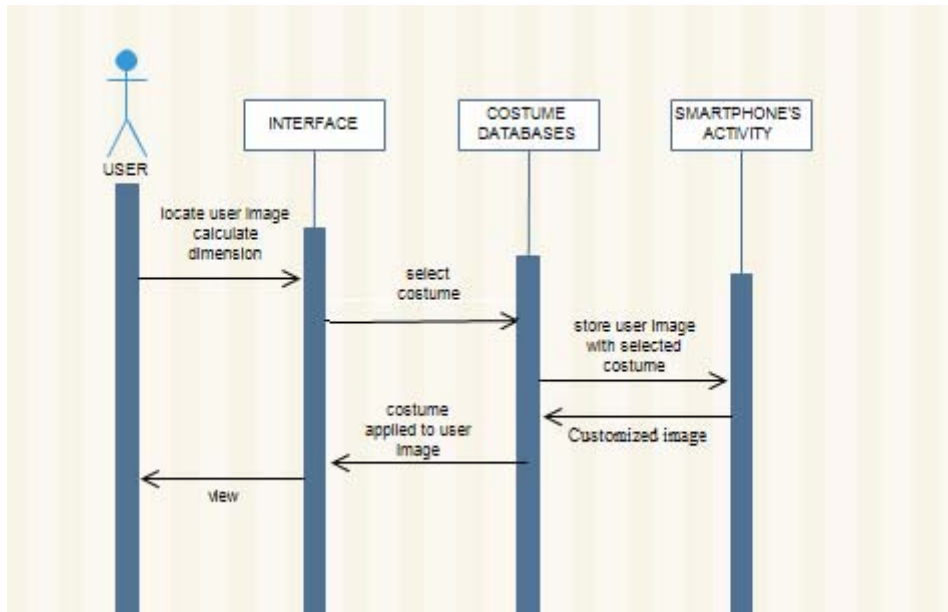


Figure 4.3-4 Costume rendering

After the detection of the user image and calculation of dimension .the user will see and navigate to the inventory from where the desired costume will be chosen for rendering on the user image. The costume will be rendered to the user image and then user can see if the costume suits them best.

### 4.3.5 Comparison of the Costume

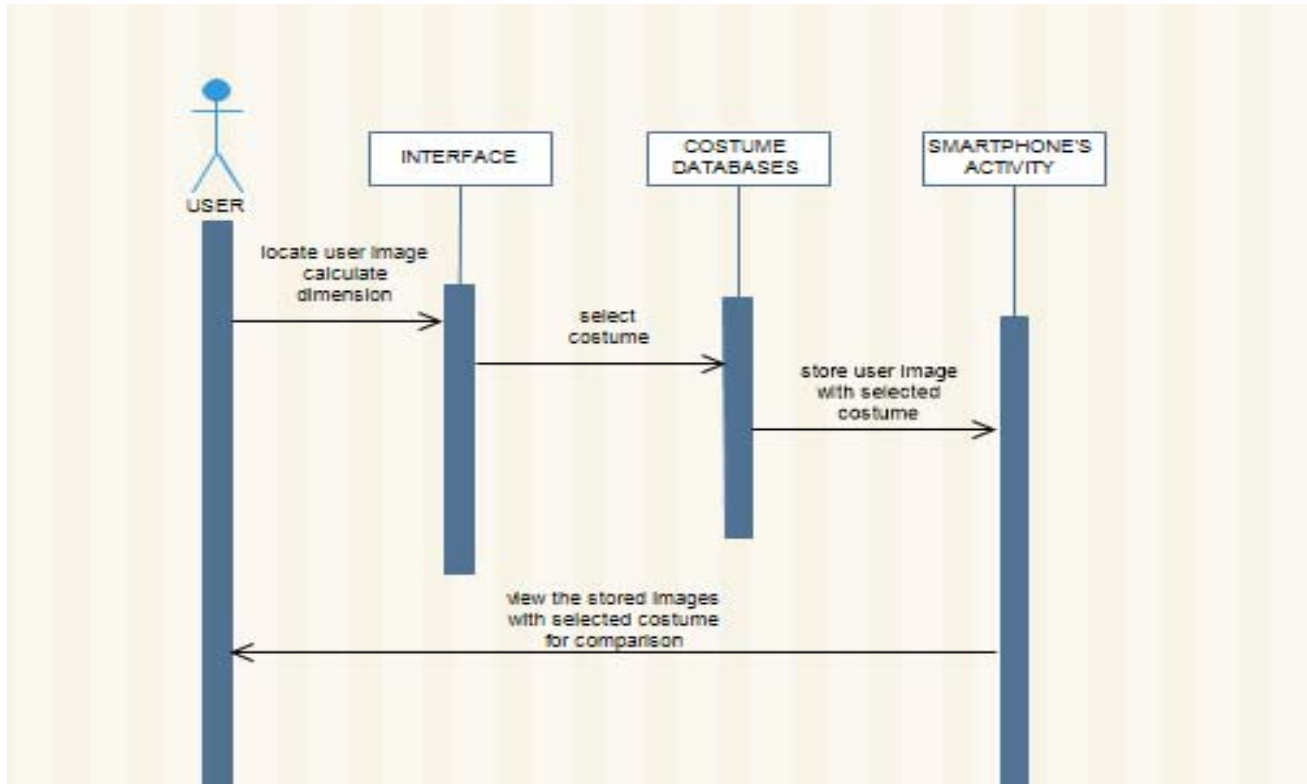


Figure 4.3-5 comparison of costumes

After the rendering of the selected costume on the user image. Finally the user will check the smartphone's activity where user can do comparison between costumes so it will make user to easily decide which costume is looking perfect and suits them best.

### 4.4 User Interface Design

The most important and the extreme part of any application is the graphical user interface that allow user to interrelate with the application through graphical icon and with graphic indicator .It also show how the application is presented to the actual user and how it actually look like so keeping the status of GUI in mind one should have to carefully design the GUI of the application in order to gain the attention of the user and make it user friendly and calm for customer to use. While designing the GUI of the android application one should carefully work because the android application is fulfilled on various screens and they have dissimilar sizes .

Below are some drafts that may be used in the application.



*Figure 4.4 User Interface Design*

## 4.5 System Architecture

### 4.5.1 Data Flow Diagram

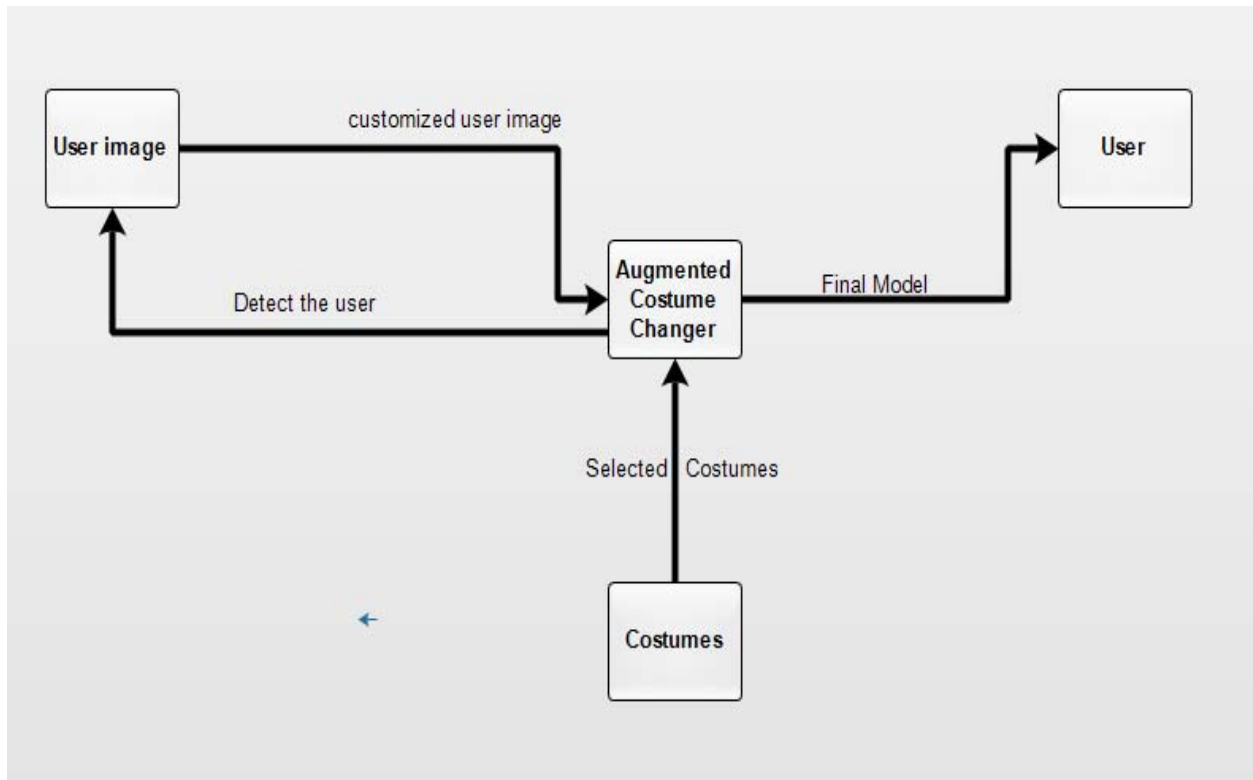


Figure 4.5-1 DFD 0 Level

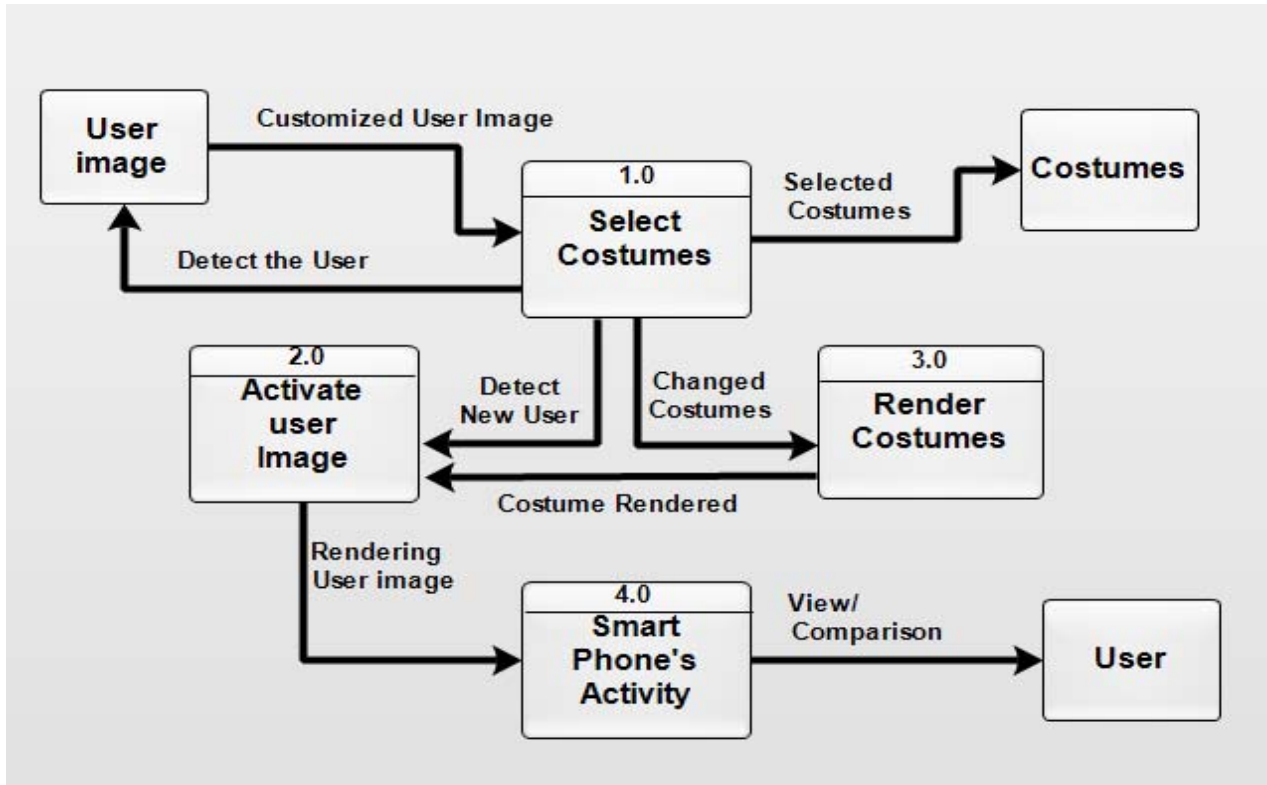


Figure 4.5-2 DFD 1 Level

**CHAPTER 5**  
**SYSTEM**  
**IMPLEMENTATION**

## 5.1 Development Environment

### 5.1.1 Open CV

It is library of programming mainly used for real time programming and computer vision, It was developed by intel and maintained by willow garage and nowadays maintained by Itseez. It is a multiple stage and free for use under the open source license. The first alpha version of Open cv was out to the public at the IEEE conference in 2000, and five betas were released between 2001 and 2005. The first version was out in 2006. Open cv acquired shared support from willow garage, and is now again below active development.

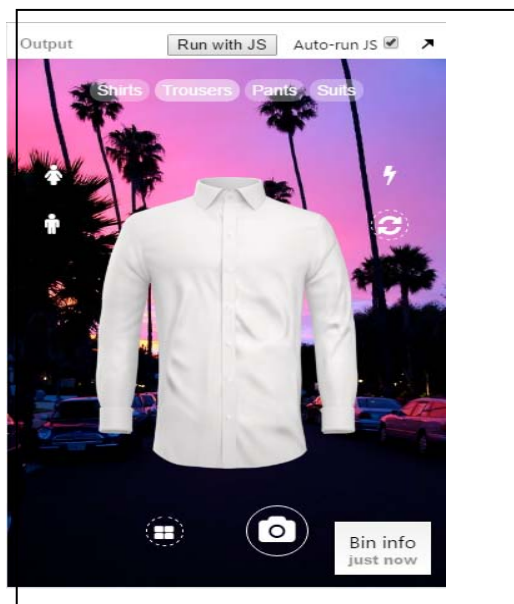


Figure 5.1-1 Open cv

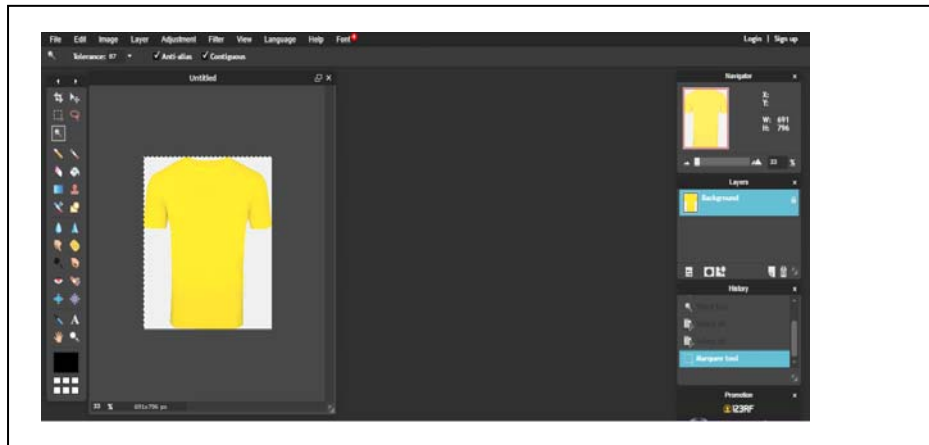
### 5.1.2 Android Studio

Android Studio is the certified integrated development atmosphere (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and planned definitely for Android development. Android Sdk is a software expansion kit that enables designers to produce applications for the Android platform. The Android SDK contains sample projects with source code, development tools, an emulator, and essential libraries to build Android applications.



### 5.1.3 Adobe Photo-shop

Adobe photo-shop was used in making the costumes models used in the project. The image below give the idea of how costume model was created.



*Figure 5.1-3 Adobe photo-shop*

The Costume model generated by the adobe photo shop is made by playing with some shapes and set the blend mode to Multiply and the Opacity to 80% wand with the help of Rectangular Marquee Tool.

### 5.1.4 Apache Cordova

Cordova Android is an Android application library that permits for Cordova-based developments to be assembled for the Android Stage. Cordova built applications are, at the central, applications inscribed with web expertise: HTML, CSS and JavaScript.

Further down is the source code that is castoff in the application for back-end and front-end.

#### **Back-end**

```

document.addEventListener('deviceready', function(){
  var mens = {
    tags : ["Shirts", "Pants", "Trousers"],
    pants : [
      "img/cloths/men/pant (1).png",
      "img/cloths/men/pant (2).png",
      "img/cloths/men/pant (3).png",
      "img/cloths/men/pant (4).png"
    ],
    trousers :[
      "img/cloths/men/trouser (1).png",
      "img/cloths/men/trouser (2).png",
      "img/cloths/men/trouser (3).png",
    ],
    shirts: [
      "img/cloths/men/shirt (1).png",
      "img/cloths/men/shirt (2).png",
      "img/cloths/men/shirt (3).png",
      "img/cloths/men/shirt (4).png",
      "img/cloths/men/shirt (5).png",
    ]
  }
};

var women = {
  tags : ["Dress", "Pants"],
  pants : [
    "img/cloths/women/pants (1).png",
    "img/cloths/women/pants (2).png",
    "img/cloths/women/pants (3).png",
    "img/cloths/women/pants (4).png"
  ],
  dress :[
    "img/cloths/women/dress (1).png",
    "img/cloths/women/dress (2).png",
    "img/cloths/women/dress (3).png",
  ]
};

var selected = null;
var selectedCategory = null;
var selectedIndex = null;

/*$('input[type="range"]').rangeslider({
  polyfill : false});*/

$(function(){
  $(".male").on("click",function(){
    $(".tags").fadeOut(500, function() {
      $(this).empty().show();
      mens.tags.forEach(function(value, index){
        $(".tags").append("<button
class='ripple'>"+value+"</button>")
      });
      $(this).children().eq(0).addClass('active');
      selected = "mens";
      selectedCategory = mens.tags[0].toLowerCase();
      selectedIndex = 0;
      $(".top-center").html("<img src='"+mens[selectedCategory][0]+' "
class='slider-img dragme'>");
      $(".slider-img").draggable().resizable();
    });
  });
});

```

```

    $(".female").on("click",function(){
        $('.tags').fadeOut(500,function(){
            $(this).empty().show();
            women.tags.forEach(function(value,index){
                $(".tags").append("<button
class='ripple'>"+value+"</button>")
            });
            $(this).children().eq(0).addClass('active');
            selected = "mens";
            selectedCategory = women.tags[0].toLowerCase();
            selectedIndex = 0;
            $(".top-center").html("<img src='"+women[selectedCategory][0]+"''
class='slider-img dragme'>");
            $(".slider-img").draggable().resizable();
        });
    });

$(document).on("click",".tags button",function(){
    selectedCategory = $(this).text().toLowerCase();
    selectedIndex = 0;
    $(".top-center").html("<img src='"+mens[selectedCategory][0]+"''
class='slider-img dragme'>");
    swapFunction();

});

```

## Camera preview

```

CameraPreview.startCamera(options);

$("#capture").on("click",function(){
    $hide = $(".tags,.content,.content-right,footer,.rangeslider");
    $hide.hide();

    CameraPreview.takePicture({width:
$(window).width()},function(base64PictureData){
    $img = $("#background");
    $("#background").show();
    imageSrcData = 'data:image/jpeg;base64,' +base64PictureData;
    $('#background').attr('src', imageSrcData);
    $("#background").css({
        "display": "block !important",
        "position": "absolute",
        "height": "100vh",
        "width": "100vw",
        "z-index": "-1",
        "position": "absolute",
        "top": "50%",
        "left": "50%",
        "transform": "translate(-50%,-50%)"
    });
    setTimeout(function(){
        navigator.screenshot.save(function(error,res){
            if(error){
                console.error(error);
            }else{
                console.log('ok',res.filePath);
            }
        });
        $("#background").hide();
    });

```

```

        $hide.show();
    });
    }, 3000);
});

});

$("#rotate").on("click", function(){
    CameraPreview.switchCamera();
});

```

## Front-end

```

<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">

  <title>Tryit</title>

  <meta name="viewport" content="user-scalable=no, initial-scale=1, maximum-
scale=1, minimum-scale=1, width=device-width">
  <link href="css/bootstrap.min.css" rel="stylesheet" type="text/css" />
  <link href="css/font-awesome/css/font-awesome.min.css" rel="stylesheet"

</head>
<body>
  <img src="" id="background">
  <div class="tags">

  </div>
  <div class="top-center">
  </div>
  <div class="content">
    <div class="female ripple">
      <i class="fa fa-female" aria-hidden="true"></i>
    </div>
    <div class="male ripple">
      <i class="fa fa-male " aria-hidden="true"></i>
    </div>
  </div>
  <div class="content-right">
    <div class="flash ripple">
      <i class="fa fa-bolt" aria-hidden="true"></i>
    </div>
    <div class="rotate ripple" id="rotate">
      <i class="fa fa-refresh" aria-hidden="true"></i>
    </div>
  </div>
  <footer>
    <div class='camera-btn ripple round' id="capture">
      <i class="fa fa-camera" aria-hidden="true"></i>
    </div>

  </footer>

  >
</body>
<script src="js/jquery-1.7.2.min.js"></script>

```

```
<!-- <script type="text/javascript" src="js/rangeslider.min.js"></script> -->
<script src="js/jquery-ui.min.js"></script>
<script src="js/jquery.ui.touch-punch.min.js"></script>
<script type="text/javascript" src="js/jquery.touchSwipe.min.js"></script>
<script type="text/javascript" src="cordova.js"></script>
<script src="js/main.js"></script>
</html>
```

# CHAPTER 6

## SYSTEM TESTING

## 6.1 Installation Testing

Installation testing patterned that software application is effectively mounted and it is working as probable after installation. It is a kind of value assurance work in software industry that emphasizes on what user will need to do install and set up the different software fruitfully. This is testing phase prior end user will initially relate with the real application. This test is to see likewise the compatibility of the application with several kinds of the operating system. The testing process may contain full limited or improvements install / uninstall process.

### Installation Testing

<b>Test Case ID</b>	TC_01	Use Case Id	1.0
<b>Description</b>	To get the application installed without any error		
<b>Applicable for</b>	Android users		
<b>Requirements</b>	Android device		
<b>Initial Conditions</b>	OS should be of compatible version		
<b>Step</b>	<b>Full / Repr</b>	<b>Task</b>	<b>Result</b>
1		.apk file was transferred to the device	<b>Pass</b>
2		It was run as other source	
3		Application installed successfully	<b>Pass</b>
4	R	Installation was done on various devices with different versions.	<b>Pass</b>

*Table 6.1-1 Installation testing*

**Result:** The result proved that the application was able to be installed on every Android version, hence no compatibility issue.

## 6.2 Graphical User Interface Testing

GUI recycled for guaranteeing the appropriate functionality of the graphical user boundary of the bid .GUI testing evaluates design elements such as layout, screen resolution, screen orientation, color, fonts, labels, text boxes, links, icons, text formatting and content. Dissimilar devices vary in their overhead mentioned properties so the developer has to take into consideration all the facts while developing the app so that it may not have any running error on any device it needs programming and it is also time consuming. Diversity of test cases is achieved for GUI testing.

### User Interface Testing

<b>Test Case ID</b>	TC_02	Use Case Id	2.0
<b>Description</b>	To see proper functionality of the UI		
<b>Applicable for</b>	Android OS		
<b>Requirements</b>	Android device		
<b>Initial Conditions</b>	Application properly installed		
<b>Step</b>	<b>Full / Regr</b>	<b>Task</b>	<b>Result</b>
1		Locate the view and layout parameters in eclipse	
2		Tested the application	<b>Fail</b>
3		Set the resolutions manually in the code	
4		Apply the percentage of dimensions	
5	R	Run the code to see resolution error	<b>Pass</b>

Table 6.2-1 Graphical User Interface testing

**Result:** The test showed that the application had no screen resolution and orientation issues.

## 6.3 Usability Testing

Usability testing is a skill used in user centered interaction scheme to value a product by testing it on user. Fundamentally it is a process used to calculate how stress-free software is to use. Usability testing emphasizes on computing a human made products bulk to see its planned purpose. The GUI should be user friendly so that people would be attracted to the application. The application should be affective to use by people of different era/age. The aim is to recognize any usability problems, gather qualitative and quantitative facts and outline the user fulfilment with the product.

### Usability and user experience Testing

<b>Test Case ID</b>	TC_03	Use Case Id	3.0
<b>Description</b>	To see whether the GUI is usable by people of different era/age.		
<b>Applicable for</b>	Android users		
<b>Requirements</b>	Android device		
<b>Initial Conditions</b>	Application must be installed before testing for GUI		
<b>Step</b>	<b>Full / Regr</b>	<b>Task</b>	<b>Result</b>
1		Application was offered to use by a 25 year old boy	<b>Pass</b>
2		Sequential steps were carried out	
3		Interface was redesigned	
4		<b>Again offered to use by a 25 year old boy</b>	<b>Pass</b>
5		Application then presented to 45 year old male	<b>pass</b>
6	R	Sequential steps were carried out easily	<b>Pass</b>

*Table 6.3-1 Usability and user experience Testing*

#### **Result:**

The test showed that the GUI is user friendly and it was easy to understand and used by all people of different era/age.



## 6.4 Compatibility testing

Compatibility testing is a non-functional testing directed on the application to calculate the application compatibility with in diverse environment. It trials whether the application assembled is compatible with in different android OS Version.

### Compatibility Testing

<b>Test Case ID</b>	TC_04	Use Case Id	4.0
<b>Description</b>	To get the application installed without any error		
<b>Applicable for</b>	Android users		
<b>Requirements</b>	Android device		
<b>Initial Conditions</b>	OS should be of compatible version		
<b>Step</b>	<b>Full / Repr</b>	<b>Task</b>	<b>Result</b>
1		.apk file was transferred to the device	<b>Pass</b>
2		It was run as other source	<b>Fail</b>
3		Application installed successfully	
4	R	installation procedure was done on various devices having different Android versions	<b>Pass</b>

*Table 6.4-1 Compatibility testing*

**Result:** The result proved that the application was able to run properly on every Android version, hence no compatibility issue.

# **CHAPTER 7**

# **CONCLUSION**

## **7.1 Conclusion**

This project is to design a real-time fitting room application to provide the people, at home, the shop-dressing-room experience and for saving time of online shoppers who often buy stuff that does not properly fit them, just because they could not try it. The application was effective and efficient to use by people of different age/era and mental level. In the development phases of the “Augmented costume changer” there were many things that were totally new such as 3D modeling, a vast platform Android. This application can be used by any brand or outlet. It can be improved by adding various features of e-commerce, for example, if a dress is selected there should be an option for the user to pay for the chosen clothes and order the delivery. Application can be made more secure by adding the feature of login along with password from the user side. It was a chance to get familiar with the several features of opencv and how this platform works for android development.

## **7.2 Future Direction**

Application of augmented reality is becoming increasingly common. Augmented Reality is creating its way in the market place by ongoing to work with top products and companies. Our android application Augmented costume changer is also predictable to smash the consumer market soon, so that it can be used by different brands and companies. Our augmented reality application will fast growing in acceptance, due to informal downloadable types and dynamic uses on any smart phone. The tools will break the gap between the online and physical shops present a richer experience and custom-made promotions transported right to wearer.

## References

- [1] "Styliff-Application," August 2011. [Online].
- [2] "Zugara-Modelling Based desktop App" January. [Online].
- [3] "Fityour-Virtual Trail Room App," Fityour, 2013. [Online].
- [4] "Fitiquette-Virtual Dressing Room,"2014. [Online].
- [5] "Unity Wikipedia," 19 august 2015. [Online].
- [6] "Java Programming language (Wikipedia)," 11 august 2015. [Online].
- [7] "Virtual Dressing Room Technology," February 2009. [Online].
- [8] "UV Mapping- Wikipedia," Wikipeida, 15 August 2015. [Online].
- [9] Joseph Greg,Kipper "Augmented Reality: An Emerging Technologies Guide to AR" Syngress, 19 Nov 2012.208
- [10] Rigby, Chloe. "Fashion retailers opt for virtual fitting rooms", Internet Retailing , 25 January 2013
- [11] Cordero, Robert. " Can Technology Help Fashion Etailers Tackle 'Try Before You Buy ? '" Business of Fashion , 19 Dec 2012
- [12] Fitnect, "Link", [<http://www.fitnect.hu.>], 10 sept 2016 5:30pm

# Appendix A

## User Manual

1. Open the “Augmented Costume changer” application displayed on your smart phone. The app open up the camera view by using camera view you can detect the user image then if you are an adult male select the male icon, and if you consider yourself to be a Female select the Female icon. The selections can be made by the label of the icons.



2. Once the male/female category is selected the predefined costume shirts/pents appear on the screen you can easily choose your desired costume.



3. After choosing the costume press “camera” button.



4. The customize user image is generated and saved in smart phone's activity where you can do comparison between different costumes and finalize the costume.
5. To try on different costume repeat the step and customized user image is saved in smart phone activity.