

ZEROCON – ONLINE SHOP

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

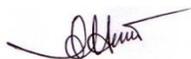
DHAKA, BANGLADESH

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APPROVAL

This project named “**Zerocon: A E-Commarce Web System with Trial**”, submitted by **Mehedi Hasan Shovon 162-15-7921, Md. Ashrafujjaman 162-15-8157, Omar Khaled Turag 162-15-8171, and Md. Abdur Rosid Rasel 162-15-7782** to the Department of Computer Science and Engineering, Daffodil International University, has been acknowledged as attractive for the halfway satisfaction of the necessities for the degree of B.Sc. in Computer Science and Engineering and affirmed as to its style and substance. The presentation has been held 07 October, 2020.

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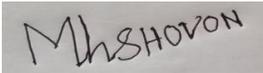
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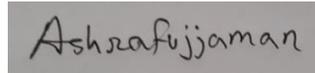


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ABSTRACT

There are 2.14 billion people who use a digital platform to buy daily livelihood these days worldwide. [1] Even Bangladesh is putting her footstep in this big market. Till the time there are about 2 thousand e-commerce sites and 50 thousand Facebook-based systems delivering approximately 30 thousand products a day. [2] During these busy days, the concept of e-commerce has made life easier and about to turn into the most important life system. Now it is high time to develop the system more efficient and user friendly. The project has aimed to let users make real-time trial before buying any product from any e-commerce site. It may help the user to know about the product more specifically. Wearable products like sunglasses, a cap, or dress must be good looking and perfect for the user. This project will solve the problem and help the user to take decisions properly before buying any product from e-commerce.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This report will express about the highlights and procedure to build up the application that we thought and worked well ordered to reach in the last accomplishment. This declaration especially holds in subtleties for the targets, structure display, scope, essential prerequisites, and by end announcing and watching techniques which are taken.

Digital technologies are making our life easier than our imagination. The world we are living right now was so unknown about some decades ago. Technologies these days have made our gadgets smarter and facilitated our daily activities. Besides having our digital assistant we can get daily livelihoods at our door-step. From food to dress, showpieces to groceries everything is available in the virtual world. We just need a finger click to wait for delivery. Now it is high time to make the system more smart and efficient for us. For wearable products like sunglasses, cap dresses it wishes to make a trial and check the item on our body. Now this project will allow users to get the service and let them try on there own face and body before buying.

Smart machine learning algorithms are capable of finding the exact shape and position of the face including eyes, mouth, hair, ear, etc. Our project is developed to put wearable items like sunglasses or cap on the perfect position. Thus the project can give the user the runtime live trial experience online. The complete system is a web-based project that is integrated with various updated technologies. The technologies and the full system is described completely in this report.

1.2 Motivation

The invention of digital technologies is to make life easier as much as possible. In this pipeline, the technology of e-commerce had been developed to buy products from home. But there is a problem showed up that, no user can trial the wearable technologies via online e-commerce sites. It causes a problem that after buying it does not suit perfectly

with the user. Our developed system is a perfect solution to this problem. As an offline buying system, we are motivated to give the user an online trial chance before buying. Thus the system will be more frequent to use and user-friendly.

1.3 Objectives

The main target of this project is developing a web-based system that can give the user an online trial experience. The system of an online trial can give users better suggestions before buying any product. Our project is not only the trial system but also a completely web-based system with product showcasing, filtering, searching, cart, and a delivery process notification. While an e-commerce site mainly means the online system for buying products, we have developed the full process of an online e-commerce system and included the offline experience of trial wearable items. The idea will make life easier and help technology to go to the next step.

1.4 Expected Outcome

The final result of the developed project is a fully-featured web-based system including showcasing items category wise, searching and filtering items, adding to cart, having an admin panel getting a notification, and updating user for the delivered items.

The main uniqueness of the project is to allow users to make virtual trial of wearable items like sunglasses and cap. The system shows a real-time video of the user and the user will be able to see the item on the video so that makes the online trial before buying.

1.5 Report Layout

This project contains six-chapter. In the first chapter named Introduction, we will talk about Introduction, Motivation, Objectives, Expected Outcome, and Report Layout. In the second chapter titled Background, we will write about the project Introduction, Related works, Comparative Studies, Challenges of our project. The third chapter is named Requirement specification. It contains Business Process Modeling, Requirements Analysis, and collection, Use Case Modeling and Description, Design Requirement of our project. In the fourth chapter which is named Design Specification, where we will talk

about Front-end Design, Back-end Design, and Implementation Requirements of our project. In the fifth chapter, which name is Implementation and Testing. Here we will discuss Implementation of Database, Implementation of Interaction, and Testing Implementation. In our sixth chapter, also, the final chapter named Conclusion and Future scope of our project. In this chapter, we will talk about Discussion and Conclusion, and Scope for Further Development. In this report, we talk about our application and its various problem, solution, and use of the project.

CHAPTER 2

BACKGROUND

2.1 Introduction

Automated face recognition (AFR) has received a lot of attention from both research and industry communities for three decades [3] due to its fascinating range of scientific challenges as well as the rich possibilities of commercial applications [4]. Life has been so dependent on online services these days. The future of the online service is also so enhanced and the system is going to be part of our daily life. Now we are planning to develop an e-commerce website with an online trial system. The online trial system can make the process easier and more advanced for users. Our developed system can capture real-time video and place the sunglass or cap on the face at the right place. Thus, any user can check out the product on his / her face.

2.2 Related Works

During the development of smart technology the searching for easier life style is always on. On that continuity online e-commerce sites are developed. Now it is time to take the process further ahead. So some big fish of technology like Microsoft and Amazon developed this types of techniques for online shopping experiences.

Swivel: Swivel is a virtual dressing room system. The system is developed for markets where customer can change dress and compare. The project is developed under the supervision of Microsoft. It uses KINECT camera from mirosoft to develop the whole project.[5]

Jeeliz: Jeeliz is a web based system for online trial. It says to try on sunglasses virtually with webcam (or a picture) before buying them [6]. The system manly developed under the supervision of Amazon. It is a direct product from Amazon, the largest online market of world.



Figure 2.1: Related Applications

2.3 Comparative Studies

[182] When the main target is to develop a system that can help users to trail before buying the system is totally unknown and new till time so that only the tech giants like Microsoft and amazon tried to build it. The projects are good to use but competitively we can identify some points from those.

Swivel which is a virtual dressing room from Microsoft is mainly works with high performance camera from Microsoft and only can be used at live market. If we have live dress on hand at live market the necessity of a virtual dressing room reduces. So that, this technique can not be used from home.

Jeeliz, Which is a online trial platform from amazon works fine and helps user to get item experience from home. But, the system used AR technology to complete the project. Thus the system can be more heavy to use.

After all, only large tech companies took courage to develop the idea but, used heavy technologies so that user have to face difficulties. Even one of them can not be used from

home. In Bangladesh there is no technology like this that can give user this type of experience to trial from home.

2.4 Challenges

The system has been developed for users and it needs users' co-operation to have the proper outcome. While using the system user must have a device with a webcam/front cam. Without that, it is impossible to give proper advanced trial service to the user. And camera quality can be an issue. We have been working on the face edges to put the item in the proper place so that at least medium quality camera is required for the trial service.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

The project is developed as a regular e-commerce website including every possible feature that can be extracted in an e-commerce site. Additionally, the project will introduce a very new feature called the online trial system. While checking the details, the user will be allowed to make an online trial with any wearable items like sunglasses, cap, dress, etc.

The system will be started by going to the home page where the items will be shown up category wise. Every category including various offers and some articles are included on the home page. The system has its filter option to filter products with price or category. Any user can select any product from any category or read articles from the home page for his/her recreation. After reading the system can go end but after filtering price or category wise a user can choose a product and see details. Here, he/she has an option to trial the wearable product. If chooses to trial the webcam/front cam will go open start capturing real-time video. From the real-time video, the system will identify the user's face edges and set the product perfectly to show the user. Thus the user will be able to trial the product before buying.

After trial, if the user loves to buy the product he/she can just add to the cart and carts will be unique as per the used browser. Till this process users need not face log in hassles. At this stage to get the product perfectly user will log in. A logged-in user can check the profile including every detail from personal information to what has been bought by him/her. Especially, a logged-in user will be able to check the current status of the order.

The status will show that if the product has been delivered or not. How many days it can take to get the product. After all formalities, the product will be delivered to the customer. Thus, in an online e-commerce platform, a user will be allowed to trial the wearable product. It must be the first time in Bangladesh.

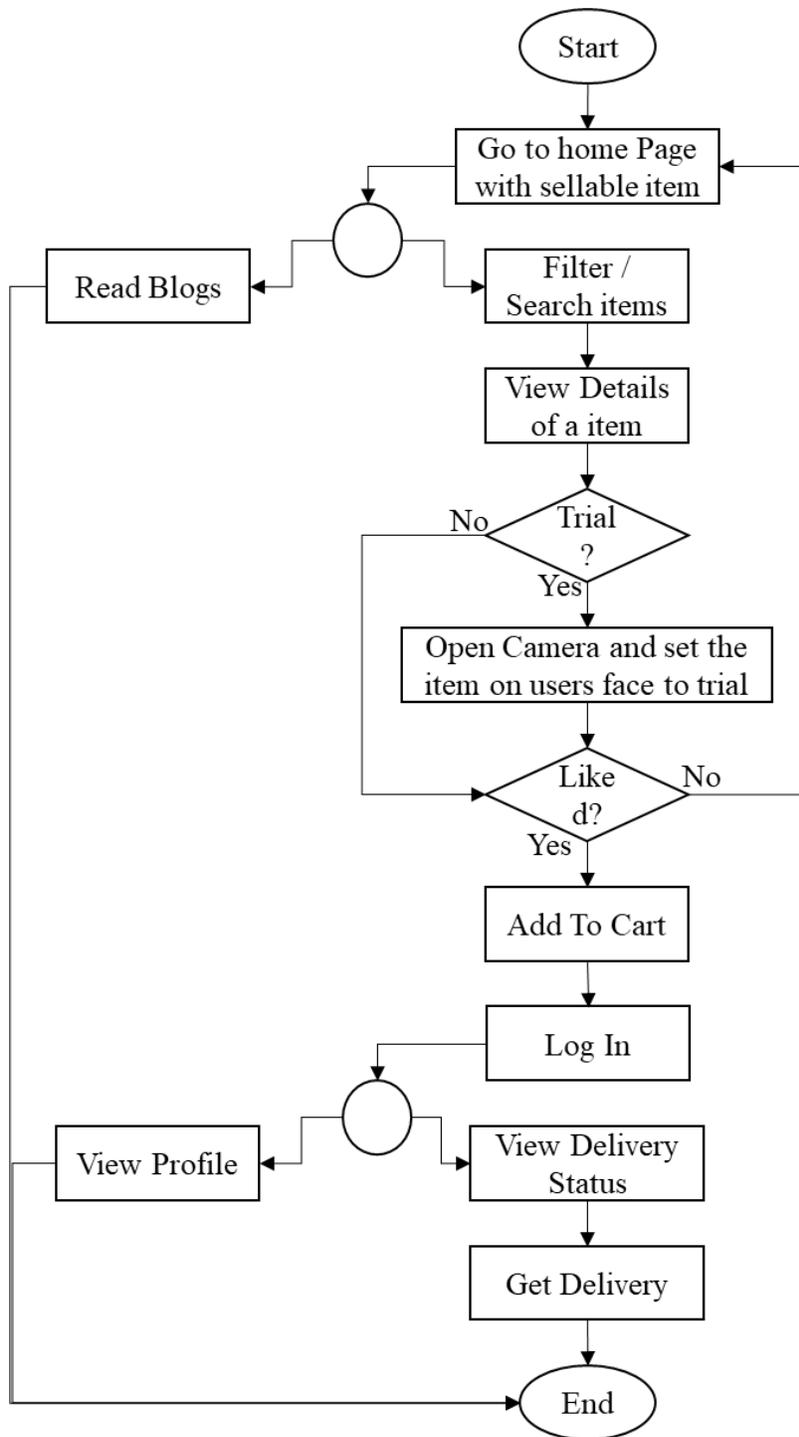


Figure 3.1: Business Process Model

3.2 Requirement Analysis

3.2.1 Software Requirements:

- JavaScript,
- NodeJs,
- ExpressJs,
- ReactJs,
- Redux,
- npm modules,
- notification,
- authentication,
- OTP,
- JSX,
- MySql Database,
- API,
- rest API,
- TensorflowJs,
- Face-API,
- Canvas

3.2.2 Hardware Requirements:

- Operating system: Windows
- Computer configuration:
 - RAM-8GB (min)
 - Hard Disk- 150GB (min)
 - Processor- 1.5GHz (min)

3.3 Use Case Modeling and Description

A use case model is a graphic description of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify, and organizing system requirements. Figure 3.2 shows the use case modeling of the application.

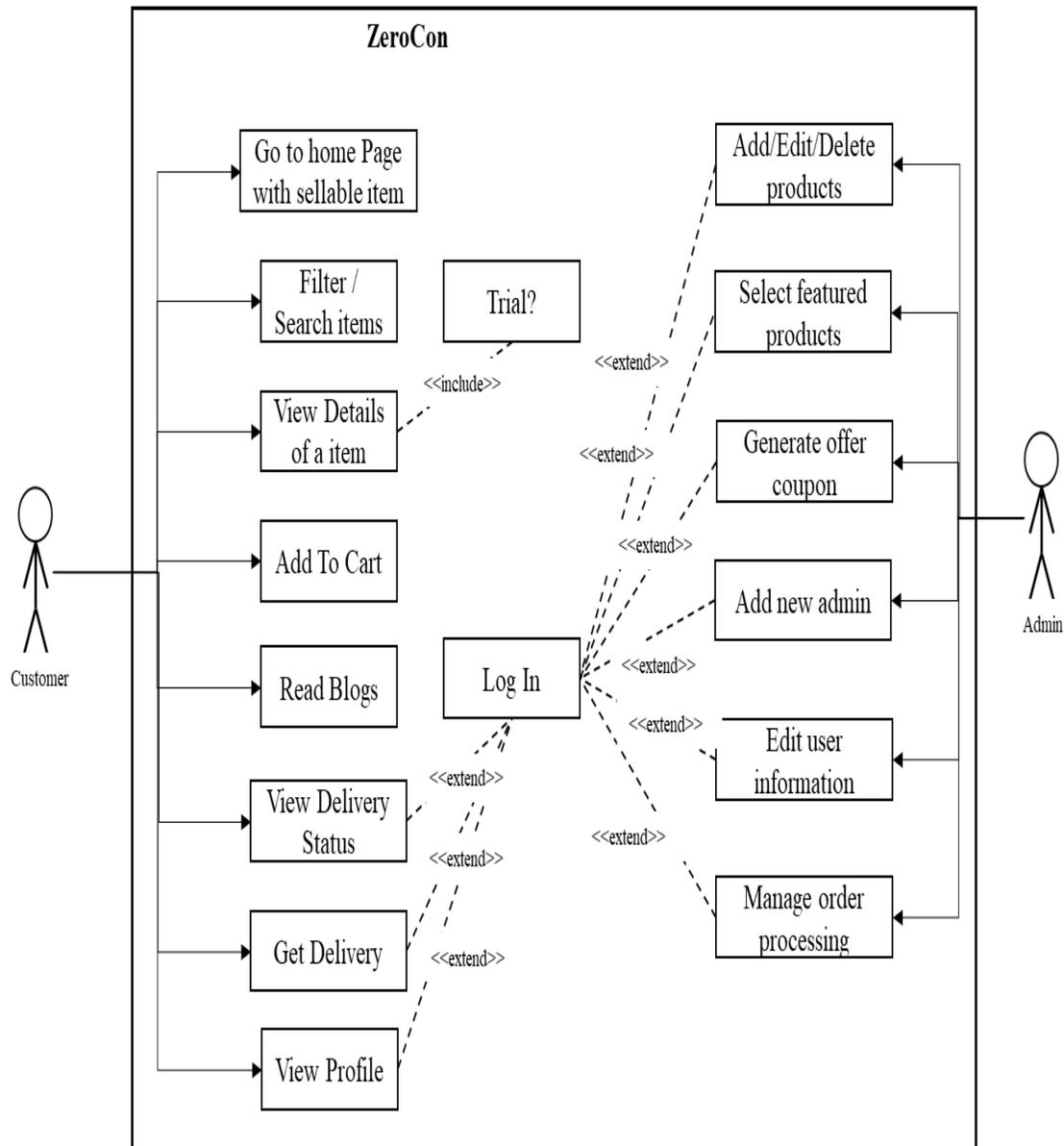


Figure 3.2: Use case Diagram

Use case details:

Use case of Go To Home Page:

Table: 3.1

Use case name	Go To Home Page
Use case details	At the very beginning, the user will go to the home page to start getting the service.
Pre-condition	
Actor	“Customer”

Use case of Search for Trial:

Table: 3.2

Use case name	Trial
Use case details	To get the perfect experience of using the product user can make online trials using a camera.
Pre-condition	View Details of an Item
Actor	“Customer”
Post-condition	

Use case of View Delivery Details:

Table: 3.3

Use case name	View Delivery Details
Use case details	The customer will know the current status of the product to make a guess when he/she will get the item on hand.
Pre-condition	Log In
Actor	“Customer”
Post-condition	

CHAPTER 4

PROJECT METHODOLOGY

4.1 Introduction

The aim of developing the project was to make an efficient e-commerce website including an online live trial system. Usually, we can have a chance to trial sunglasses or cap before buying if we buy offline. But, during this era of smart lifestyle, it is now time to make a smart trial system for these wearable products like sunglasses or cap.

The whole methodology has been designed as per a perfect solution of the e-commerce system including a featured service which is trial before buying. A user only needs a webcam or any front-facing camera to get proper service.

4.2 Methodology

The system will be started by going to the main page where items will be displayed by category. Every category including various offers and some articles are included on the main page. The system has its filter option to filter products by price or category. Any user can choose any product from any category or read articles from the homepage to entertain himself. After reading the order it could end but after price or category wise filtering, the user can choose a product and see details. Here, he/she has an option to try out the wearable product. If you choose to try the webcam / front camera, start capturing video in real-time. From the real-time video, the system will define the edges of the user's face and perfectly adjust the product to show the user. Thus the user will be able to try the product before purchasing.

After the trial, if the user likes to buy the product, he/she can just add it to the cart and the carts will be unique according to the browser used. Until this process, users do not need to face the hassle of logging in. At this stage to get the product ideally the user will log in. The logged-in user can check the profile including all the details from personal information to what was purchased by him. In particular, the logged-in user will be able to check the current order status.

4.2 Design Specification

Design is a part that interacts with a user directly. This segment lets the user feel comfortable using the system. Our developed project has a perfect suitable interface to interact with users.

4.2.1 Home Page

The system has a perfect using home page. For getting the service home is the combination of systems included in the project. The home page started with a slider of group of images and other facilities is going to be described below.

A home page is a very important part of a website. It can make the first impression to the users. That is why we have extra focus on developing a well viewed home page.

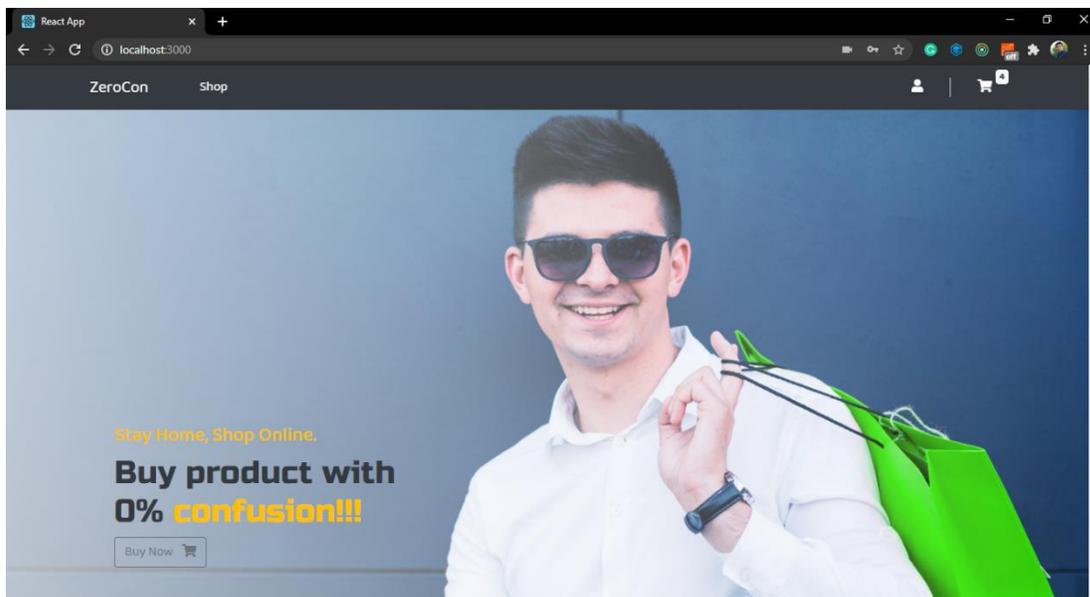


Figure 4.1: Home Screen

4.2.2 Featured Product

For making the website more frequent in searching suggesting featured products is a very common practice. Where our project aimed to make the website more user friendly, we cannot leave the topic. We have kept a different table in database with unique product ID

and name. The Admin will control the list featured product. Thus, the good quality products will always be on top and user can find the good quality item very easily.

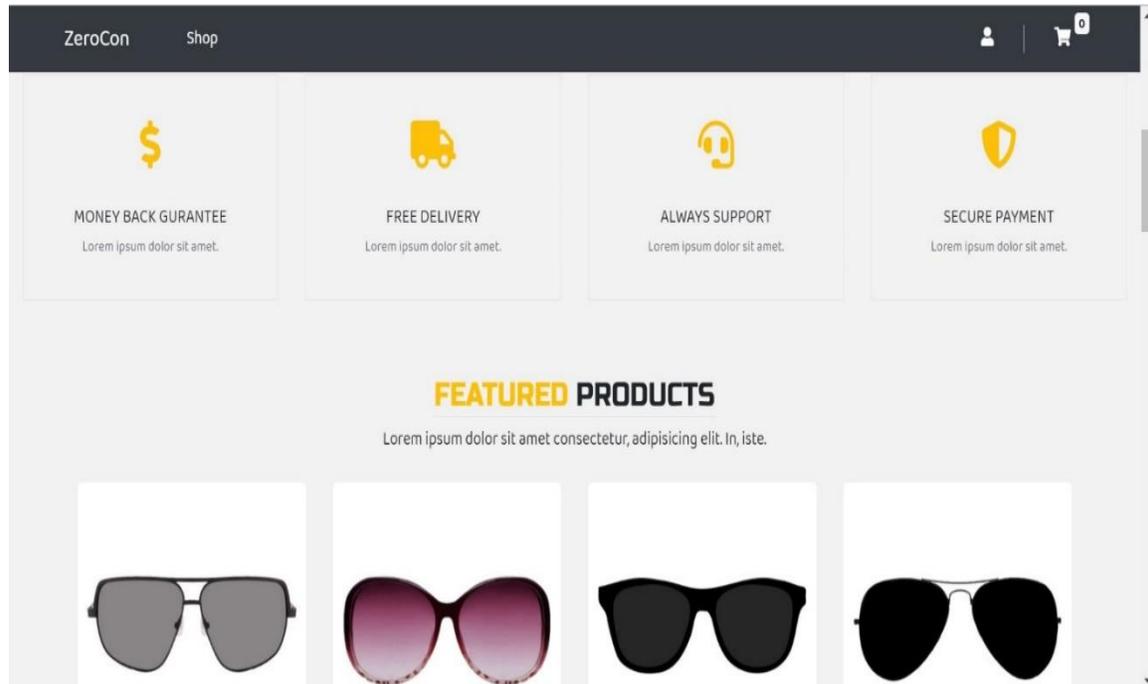


Figure 4.2: Featured Items

4.2.3 Promotions and New Product:

During various events like Eid, Ramadan or independent day admin can input various offers. The offers can be added as perfectly designed images. Some campaigns or product marketing can be placed in this promotional section.

New products can be shown in completely different section. Some users who want to keep up-to-date can find new coming and new released items easily.

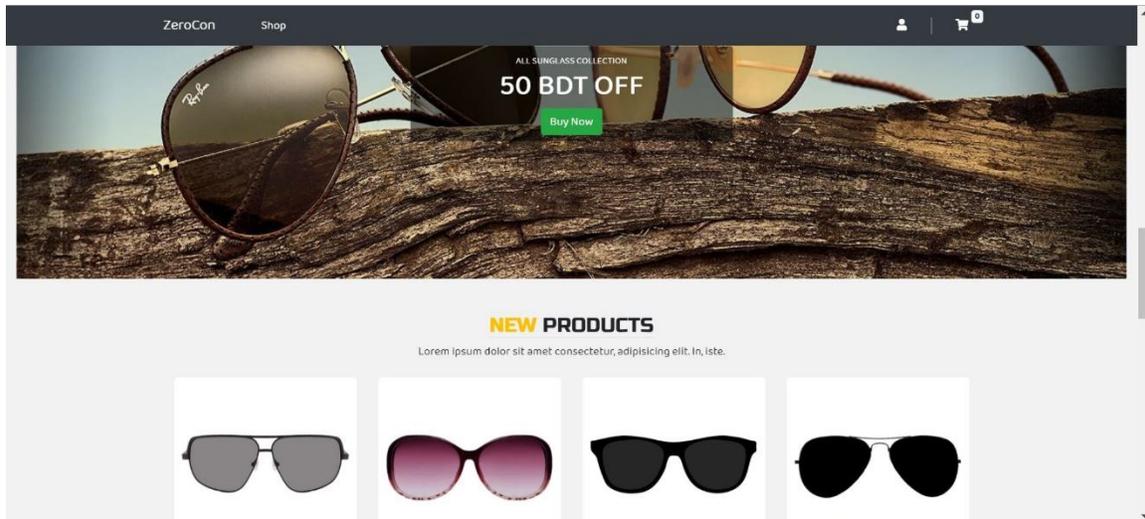


Figure 4.3: Promotions and New Products

4.2.4 Popular Category:

Not only featured items but also popular categories are kept in front so that user can find easily. People love to find trendy items. This section can help them to find easily.

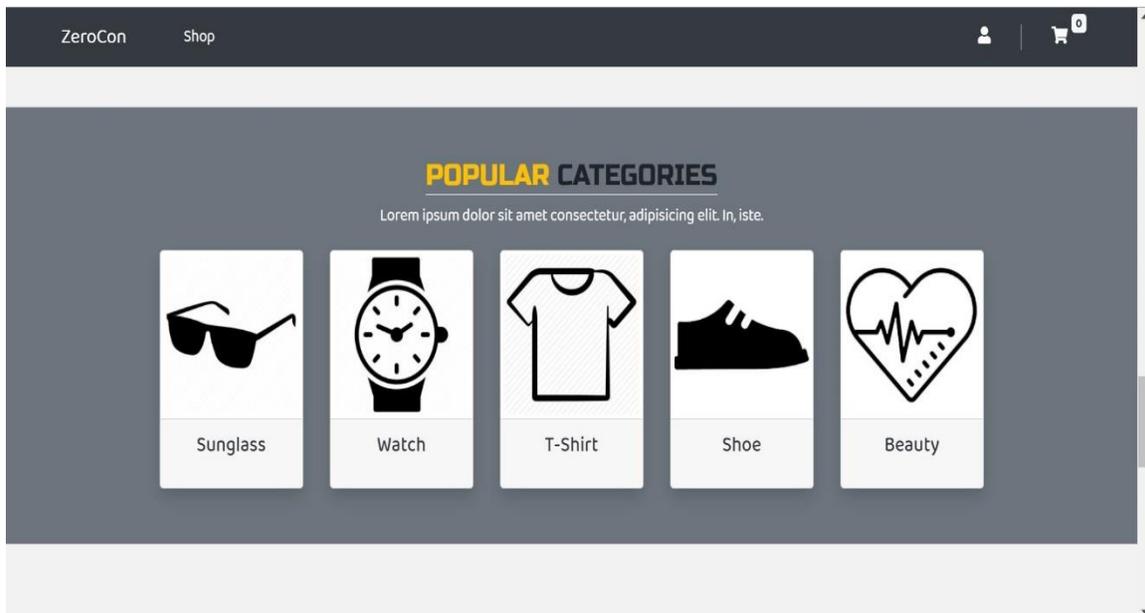


Figure 4.4: Popular Categories.

4.2.5 Latest Blog

Different fashion related blog posts are uploaded on the home page. User can have various suggestions including dos and don'ts of fashion.

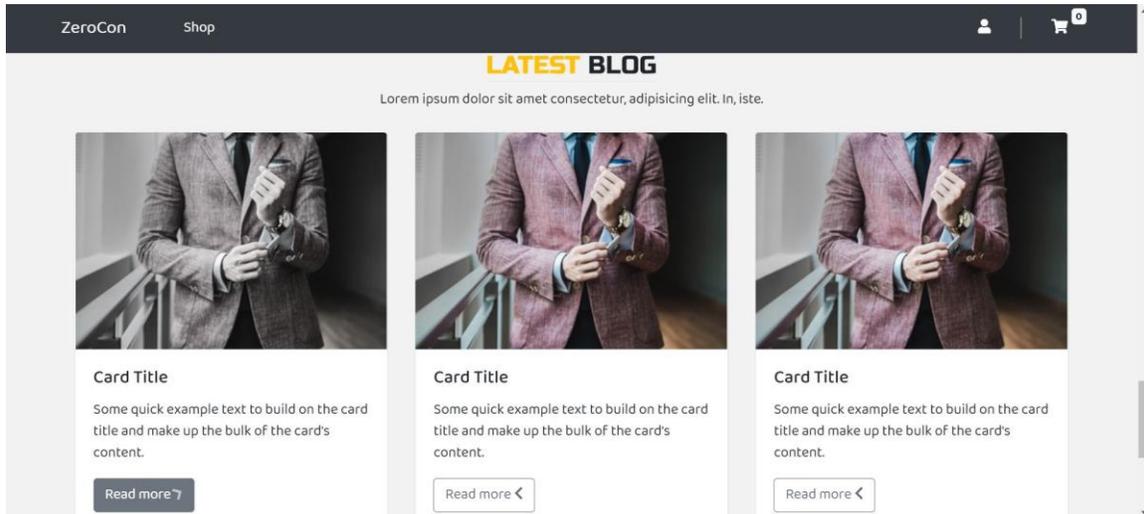


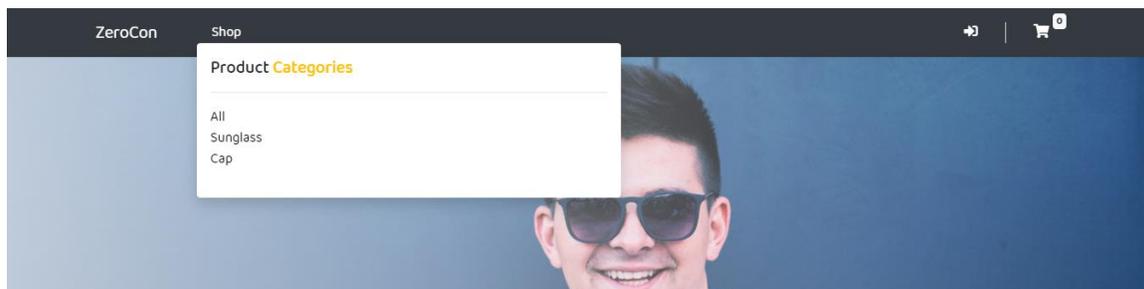
Figure 4.5: Latest Blogs

4.2.6 Header and footer

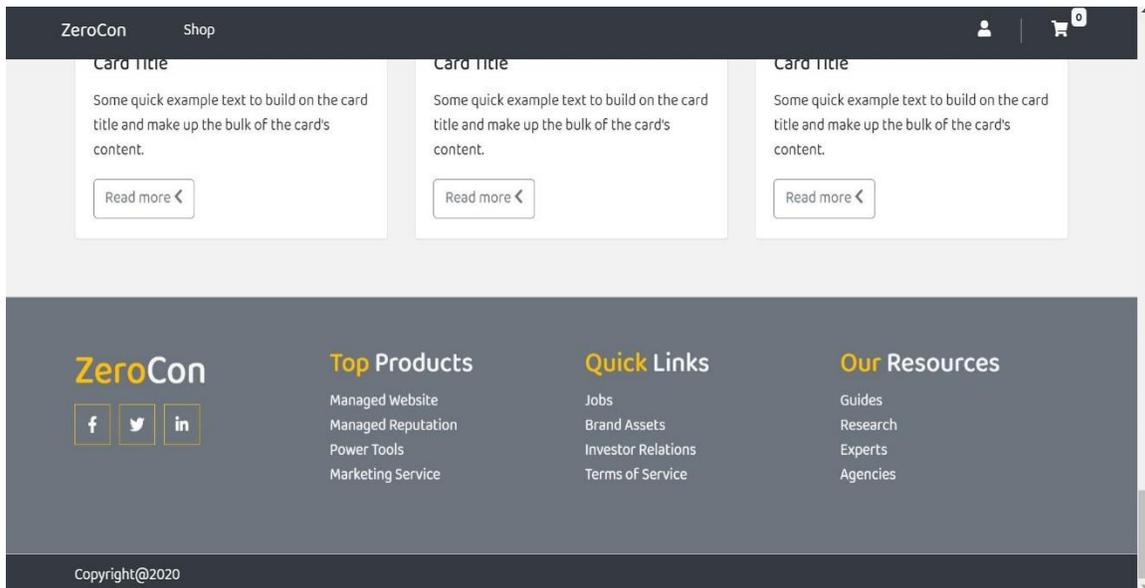
The header section has four main part.

1. Logo- that leads to home page
2. Shop- shows the categories
3. Profile- The login section
4. Cart- The list of ordered items will be added in cart.

The footer section contains the quick links and contact us. Any user can reach us easily through social networks.



(a)



(b)

Figure 4.6: Header and Footer

4.2.7 Cart Details

After placing order user can view the full list and update the list as per, he/she wants. User has complete power to delete or change quantity of any item. This page has complete information that any user wants to see before finalizing any order.

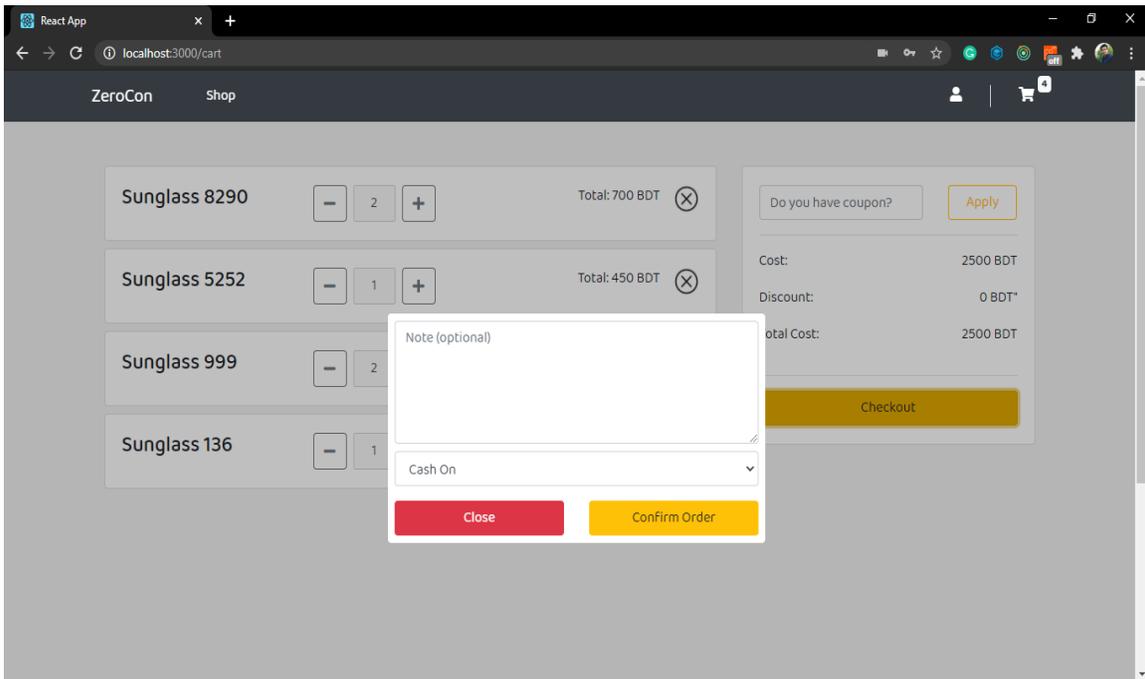
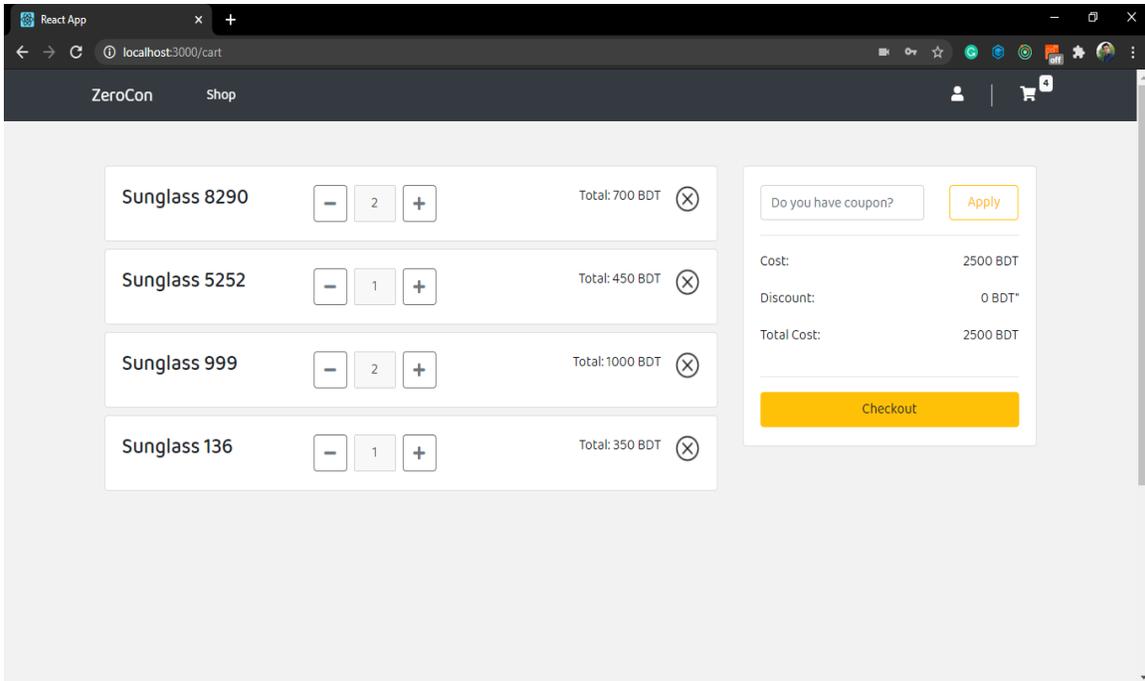


Figure 4.7: List of items in Cart

4.2.8 Product Details

For choosing any product user can view the whole description of the product. The total description includes name, price, previous price (if changed), add to cart button and a big image of the product.

The most attractive topic is user can easily trial the item virtually before buying. The virtual trial system is described broadly below.

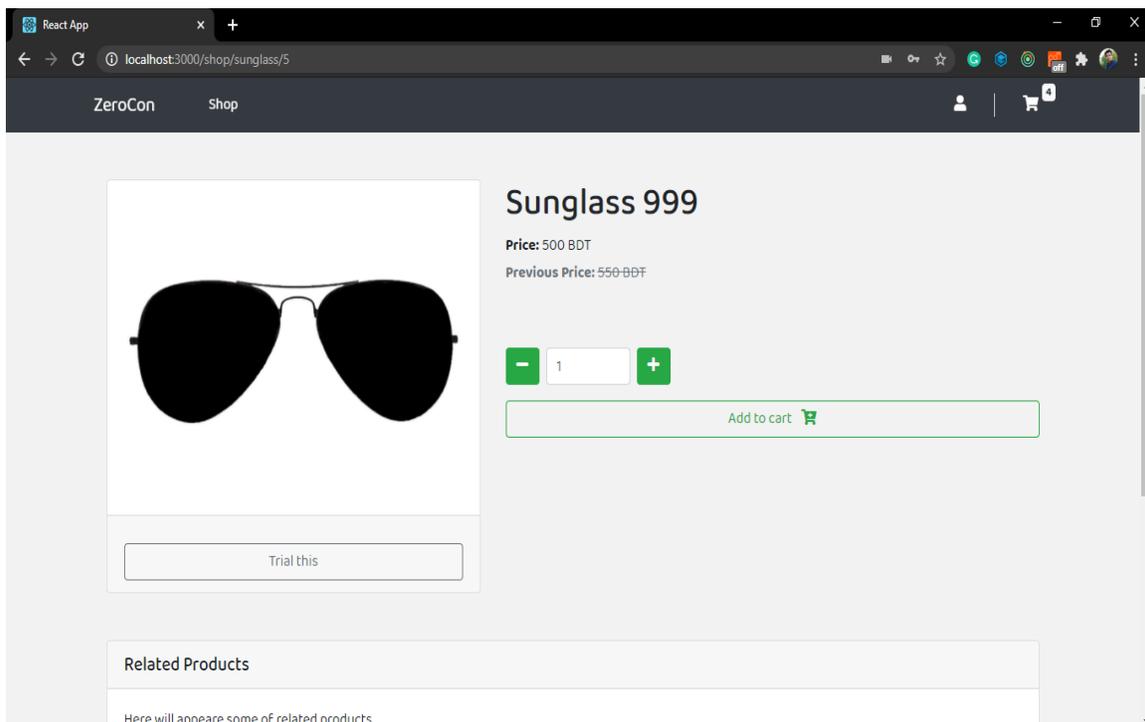


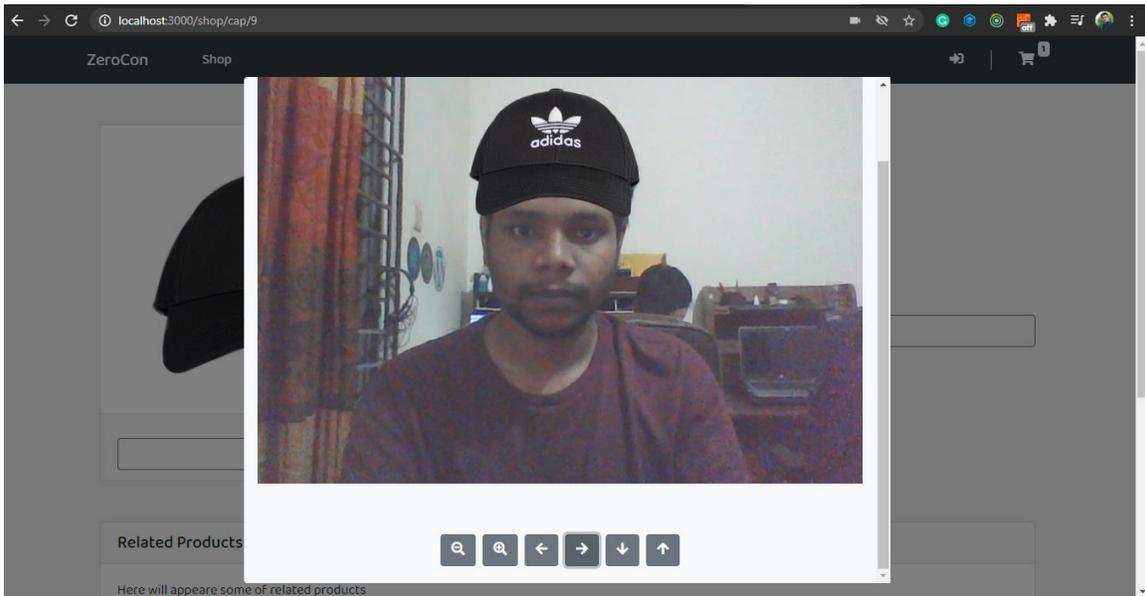
Figure 4.8: Product details

4.2.9 Online Trial Option

The most attractive feature of our system is online trial system. Our system can detect face and face edges. Every single point of the face is detected. Thus a .png image of the item with transparent background is put in the specific location on face.



(a)



(b)

Figure 4.9: The Online Trial System

4.3 Online Trial Specification

To trial the product we have taken a runtime video from device. The videos is being rendered continuously with 100 mili second duration. After rendering evry images from video get the help of Face-API for detecting face. As shown if figure below every landmarks can be found from the after render image of video.

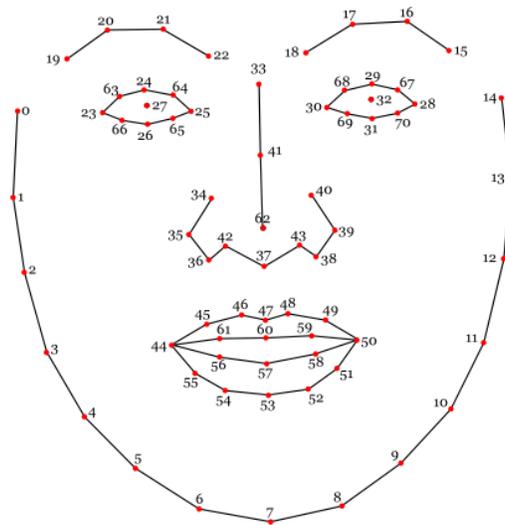


Figure 4.10: Landmarks on Face from Face-API

Face API: Face-api.js is a JavaScript API for face detection and face recognition in the browser implemented on top of the tensorflow.js core API. It implements a series of convolutional neural networks (CNNs), optimized for the web and for mobile devices.

After Detecting face edges. We can locate the specific position of our eyes or head. Using Canvas tag from HTML is created on the video the canvas holds the .png file with transparent background. According to the edge count from tensorflow face-API, we can put the png image of item on canvas at specific location.

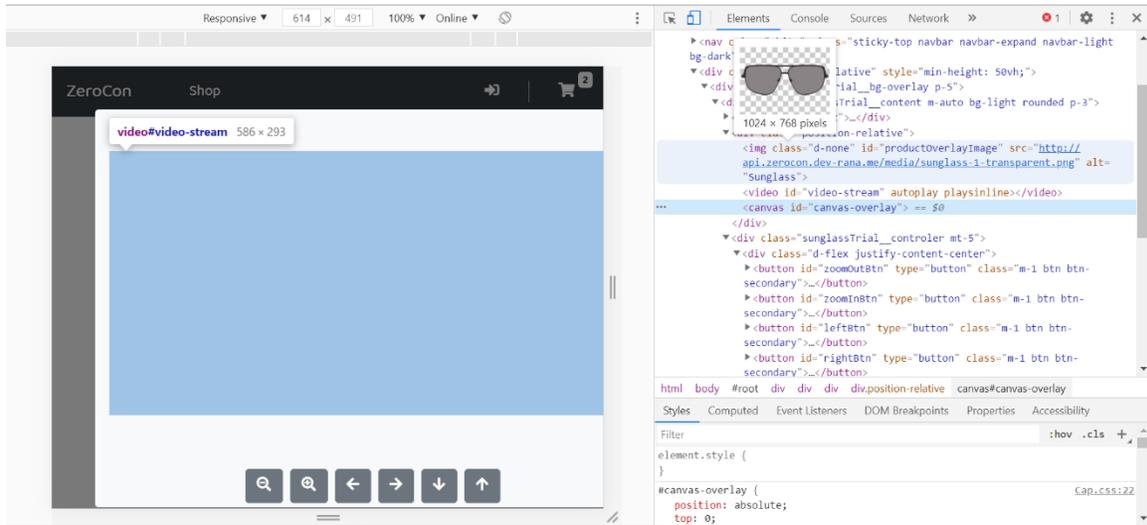


Figure 4.11: Process of Using Canvas

4.4 Back-end Design

Behind the UI, back-end works here where a user can't see that portion at all. Back-end allows implementing functionality such as backing up user data and item data to the cloud, serving content to client side, real-time interactions.

4.4.1 Data base tables

The database designed with total 10 tables. From item details to user profile including coupon, sales, order information is mapped with each other in the database. MySQL, a SQL database is used to develop this project at DBeaver, which is an universal database tool. The

The table that have been created are:

1. Item
2. Featured Items
3. Item Images
4. User
5. Profile Picture

6. Orders
7. Order Item Map
8. Payment and
9. Coupon
10. Admin

The tables are inter connected to fulfill the total task together. The Complete details is shown in following figure.

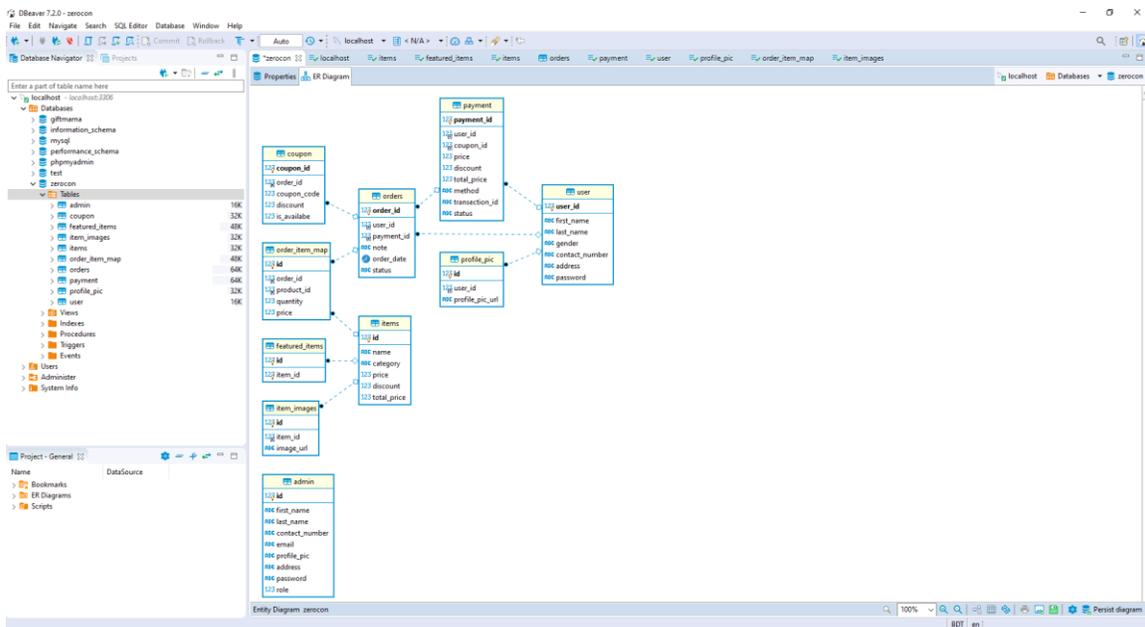


Figure 4.12: E-R Diagram

4.5 Conclusion

Thus the complete system is designed and the project works properly. Many updates can be included and variations can make the project more perfect. But, the methodology we used to mainly focus on online trial system. And this online trial system works so satisfying and perfect with our used methodology.

CHAPTER 5

IMPLEMENTATION AND OUTCOME

5.1 Introduction

The system will describe the outcome of the project. After developing the project it has been gone through several scenarios. The scenarios and reactions will be pronounced deeply during the following section.

5.2 The Outcome

The idea was to develop an e-commerce site including an online trial system. After development, it has been a perfect working dynamic e-commerce website. Every possible service related to an e-commerce site is included in the system. The most attractive feature is having a module to make an online trial. Usually, an online e-commerce site can not provide a trial service for customers. So that user can not even imagine how does it look on him/her after buying. The developed system can show specific products on the customer's face so that the customer can make an online trial before. The module works so fine that, at run time it just opens the camera and start capturing video. On the real-time video, it can put on the perfect item of the perfect location using canvas. Thus, the system works so fine and inspiring.

Additionally, its website has a dynamic home page including a filter option. Any customer can filter price-wise or category wise to find the perfect product for him/her. After choosing the product he/she can view details and while checking the details he/she can make the trial.

5.3 Advantages

- Users can virtually trial product before buying.
- Can have a perfect dynamic interface.
- Gets every possible service of an online e-commerce system.
- User friendly and

- Fast responsive.

5.4 Disadvantages

- It works in 2D.
- Users can only trial caps and sunglasses now.
- Users must have a webcam or front-facing camera.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

[117] The main goal of the project is to develop a perfect web system including trial wearable items like sunglasses cap etc. The project works successfully so that it can give the user a complete e-commerce site feel with the trial service. To trial, it will open the webcam/front-facing cam and detect a face. Thus the item can be set up in right place for trial.

Various smart technologies like JavaScript, NodeJs, ExpressJs, ReactJs, Redux, npm modules, notification, authentication, OTP, JSX, MySql Database, API, rest API, TensorflowJs, Face-API, canvas have been used to develop the full process. We use NodeJs for back-end development and ReactJs for front-end development.

After development the project worked so perfectly and performed good enough to give users an appropriate e-commerce experience. The main goal of the project was to making a online trial system and the system worked 100% accurately. It took less than a second to detect face the edges to set up the position of the product.

Initially it works only for sunglasses and cap. It can easily be used for aurnaments and for cloths in future. While the cloths online trial will be available it can also help users to trial, bag, purse, shoe and many more.

6.2 Scope for Further Developments

It is already a user-friendly application, but in the future, we are thinking about adding some more features to make this application more user friendly. There are some limitations in our use which we can come up with some betterment like

- Augmented reality can be added to give 3d feel while trial.
- AI technology can be used to automatically suggestion of which item can be suitable for the user.

- Data from the human face can be good research material.

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