

H-SHOP



By

Capt Muhammad Waqas Nasim

Capt Farrukh Munir

Capt Hassan Naseer

Capt Maaz-ullah-Mumtaz

Session 2017-21

Supervised by

Asst. Prof. Athar Mohsin Zaidi

**Submitted to the faculty of Department of Computer Software
Engineering, Military College of Signals, National University of
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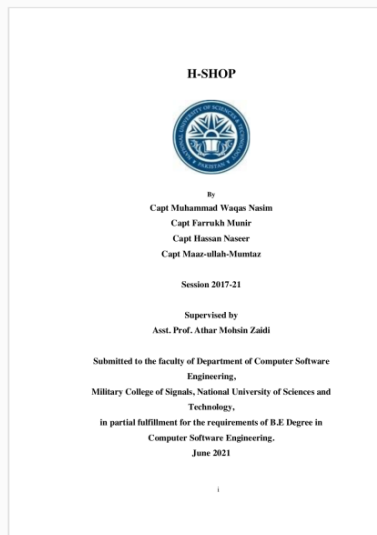


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In the name of Allah, the most merciful and the most Beneficent. Who led us to this extent. May all glory, honor and Adoration be unto Thy Name. Our special thanks go to our supervisor **Asst Prof Athar Mohsin Zaidi** for guiding us throughout the process that resulted in the successful completion of our project. We would also like to thanks to the faculty of Software Department specially **Maj Zeeshan Zulkifl, Sir Ather Zaidi** for their guidance in the building of the project. A deep gratitude towards **Dr. Adnan Ahmed Khan (Head of Computer Software Department)** for his guidance and facilitation for the Project. At last, we are most obliged to our Parents, their support contributed immensely to the success of this project.

Abstract

H-Shop is an e-commerce web application. Purpose of this project is to develop an e-commerce web application in which we do not need a dedicated backend. An advance programing platform is used for development of this e-commerce single page application which will basically not require a dedicated backend.

The focus behind this need for an application with no separate backend is to save the hassle of developing a backend, handling its authentication, authorization and need for security of both the application and intended customers with core emphasize over high performance and better user experience.

Dedication

Dedicated to my exceptional parents and adored siblings whose tremendous support and cooperation led me to this wonderful accomplishment.

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CHAPTER ONE

1.1 INTRODUCTION

1.1.1 Purpose

H-Shop is an e-commerce web application. Purpose of this project is to develop an e-commerce web application in which we do not need a dedicated backend.

1.1.2 Vision

The vision behind this need for an application with no separate backend is to save the hassle of developing a backend, handling its authentication, authorization and need for security of both the application and intended customers with core emphasize over high performance and better user experience.

1.1.3 Scope

Keeping the purpose behind this project in mind, H-Shop will be developed in React JS which is a very powerful library of JavaScript to develop “single page application”. What will make this application stand out from others is that it serves our requirement and need for no separate backend. So, the use of any dedicated backend will not be required in this way.

We will use a cloud base platform of Google's Firebase which allows to use its free storage, authentication and database (firestore) along with its own authorization for Login and Signup features. Firebase's Firestore is different from other databases. It is nonSql database i.e. we don't have to write queries to fetch data but they are just

like function calls. Firestore has a collection of data instead of a table and each collection has different documents which are similar to an entry in a table. Due to these steps, user experience and performance of application will improve immensely. Also, due to Google Firebase platform, large numbers of user will not affect the application and will not burden it.

1.1.4 Overview

An advance programming platform is used for development of this e-commerce single page application which will basically not require a dedicated backend. Due to use of Google Firebase, limitation of users is not a problem anymore and it will be quite flexible in this way. Due to use Google Firebase, it will allow us to use storage, authentication and database along with its own authorization for login and signup features, add to cart and checkout etc. Changes and addition of new product items on the application will also be very easy, we will not be hard coding them from backend and will be added dynamically.

CHAPTER TWO

2.1 SOFTWARE REQUIREMENTS SPECIFICATION

2.1.1 SYSTEM OVERVIEW

Our system's functionalities include the Signup/Login functionality which allow new users to come in our system and existing users to login so they can save their session progress. Next, the functionality to logout from the system at any time.

- The user will be able to view the products at any time from the header tabs. Inside the products page, the user can add the products to cart, read the description etc.
- By adding to the cart, user will be able to see the updated cart at any time from the header tabs. Inside the cart, user can edit the number of an item or even remove the item.
- When a user is inside the cart, they will be able to go to checkout page and provide their information for delivery. If the user is admin, they can add the product within the system
- The design of the project is very simple and modular. Each component will have its own module/folder with its own stylesheet and javascript file which includes the jsx of the component. For state management, Redux is used in a separate folder as well and same goes for firebase connection file. All static files are stored in a public folder so they can be used anywhere in the project.

2.1.2 Data Description

Whenever a product is added in the database it is saved as an object. Complete Information of product is available in that object i.e images of product, description of

product etc. This object is saved in the backend and it can have multiple types of variable, numbers, Boolean type, strings, array or even an object. In this way domain function/information is transformed into data structure.

We are using Cloud platform NoSQL database, google firebase which is an alternative to the more rigid relational databases. Storage is also provided by google firebase.

2.1.3 Data Dictionary

Main functions along with parameters are given below:-

- Signup (first name, last name, email, password)
- Log in (Email, password)
- Get user (email)
- Add to cart (Product name, Quantity)
- Checkout (Product name, Quantity, Amount, Total amount)
- Checkout details (Name, Address, city, province, contact number)

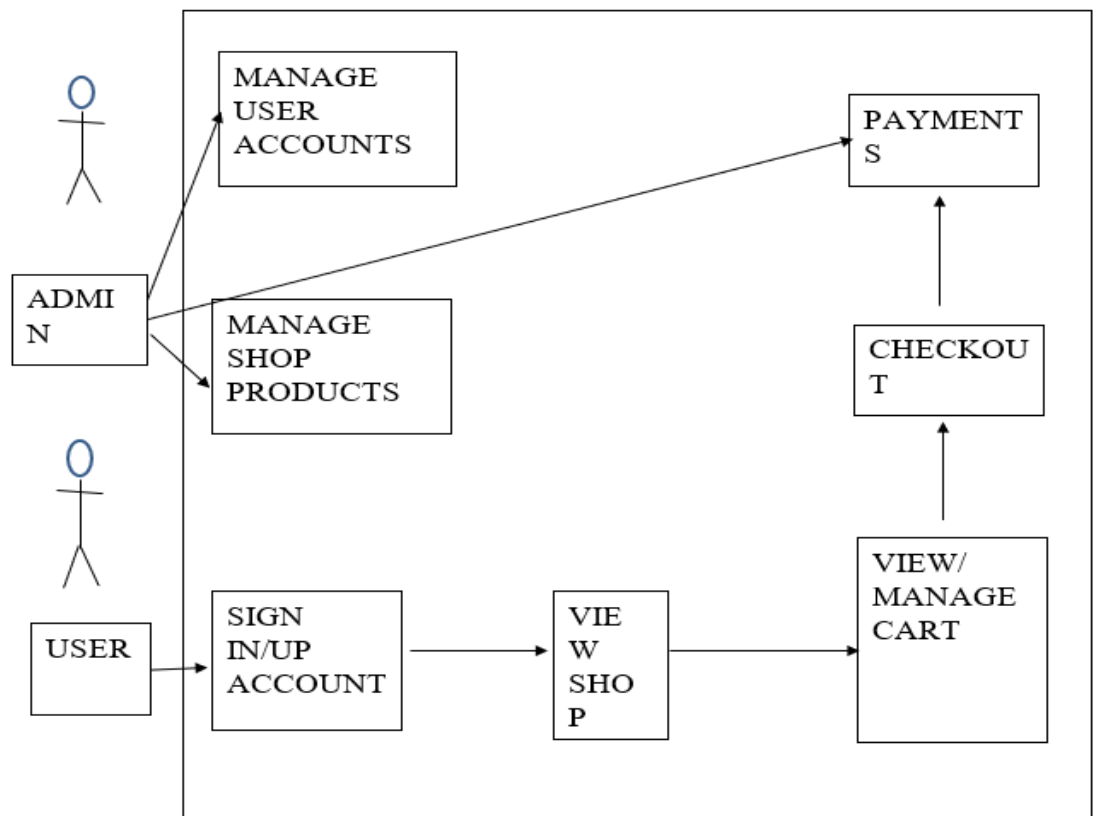
CHAPTER THREE

3.1 SYSTEM DESIGN SPECIFICATIONS

3.1.1 SYSTEM ARCHITECTURE

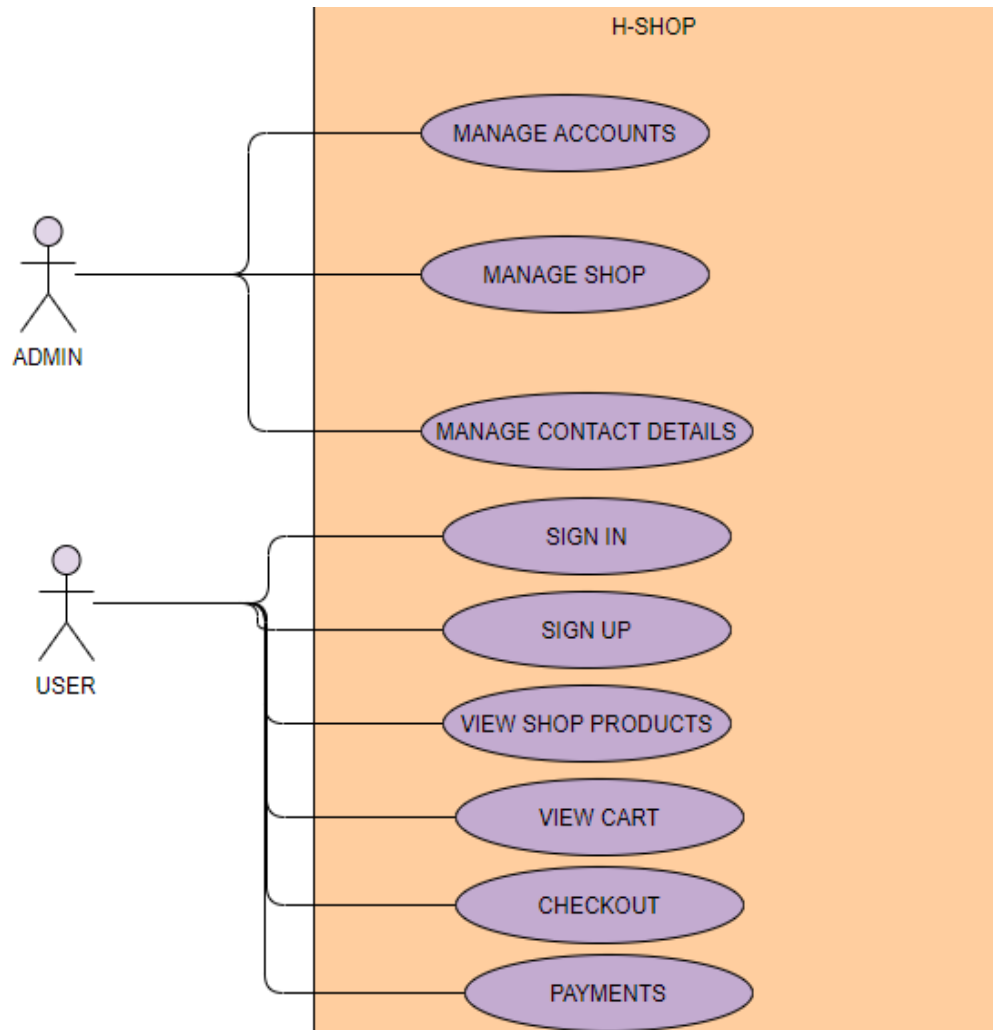
3.1.1.1 Architectural Design

ABSTRACT DIAGRAM



Abstract diagram shows an overview of the system as this shop is mainly divided into three main modules that are “Accounts management”, “Product management”, “Cart & checkout”. Modular design increases flexibility and reusability as the complete code is not required to be copied time and again instead you just need to call the module and all its components will be available at the spot. The decision to choose React JS is due to its modular architecture which is quite helpful in developing. Each component has a java script file that contains all the coding and an interface file that contains all the user interface and styling. The sub-systems are created in modular form as mainly Admin and users will be the two actors interacting with all the modules. Use Case Diagram is shown to illustrate how exactly the actors interact with different modules of the system.

3.1.1.2 USE CASE DIAGRAM



3.1.1.3 USE CASE DESCRIPTION

<i>Use Case Requirement:</i>	
<i>Use Case Paths</i> <ul style="list-style-type: none"> • <i>Sign IN</i> • <i>Sign UP.</i> • <i>View Shop Products</i> • <i>View Cart</i> • <i>Checkout</i> • <i>Payments</i> 	

Sign IN	
<i>Externals</i> <ul style="list-style-type: none"> • <i>No external resources</i> 	
<i>Preconditions</i> <ul style="list-style-type: none"> • <i>User to enter login credentials</i> 	
<i>Interactions</i> <ul style="list-style-type: none"> • <i>Login Credentials sent to Accounts data for authorization</i> 	
<i>Post conditions</i> <ul style="list-style-type: none"> • <i>If authenticated Home page will appear else sign UP will appear.</i> 	
Sign UP	
<i>Externals</i> <ul style="list-style-type: none"> • <i>No external resources required.</i> 	
<i>Preconditions</i> <ul style="list-style-type: none"> • <i>Username</i> • <i>Email</i> • <i>Password</i> 	
<i>Interactions</i> <ul style="list-style-type: none"> • <i>System will store data and will be used for authentication.</i> 	
<i>Post conditions</i> <ul style="list-style-type: none"> • <i>Home screen will appear with a welcome message for signing UP.</i> 	
View Shop Products	
<i>Externals</i> <i>No external resources required.</i>	
<i>Preconditions</i> <ul style="list-style-type: none"> • <i>Open Shop Tab on home page</i> 	
<i>Interactions</i>	

<i>User will be able to view and add to cart the products available</i>	
<i>Post conditions</i> <i>Option to view cart OR logout will be available.</i>	
View Cart	
<i>Externals</i> <i>No external resources required.</i>	
<i>Preconditions</i> <i>Items from shop to be selected</i>	
<i>Interactions</i> <i>User will be able to view the products available in the cart</i>	
<i>Post conditions</i> <i>Summary of shopping will be displayed.</i>	
Checkout	
<i>Externals</i> <i>No external resources required.</i>	
<i>Preconditions</i> <i>Cart needs to have one or more items</i>	
<i>Interactions</i> <i>Confirmed products and their prices compiled</i>	
<i>Post conditions</i> <i>Billing info and payments mode will be made visible</i>	
Use Case Requirement: <i>For using this system user must be an ADMIN</i>	
<i>Use Case Paths</i> <ul style="list-style-type: none"> • <i>Normal:</i> • <i>Admin can use this system after successful login</i> • <i>Exceptional</i> • <i>User can't access as admin without authorization</i> 	

Normal Path: Admin can use system after successful login.

Externals

- *No external resources required.*

Preconditions

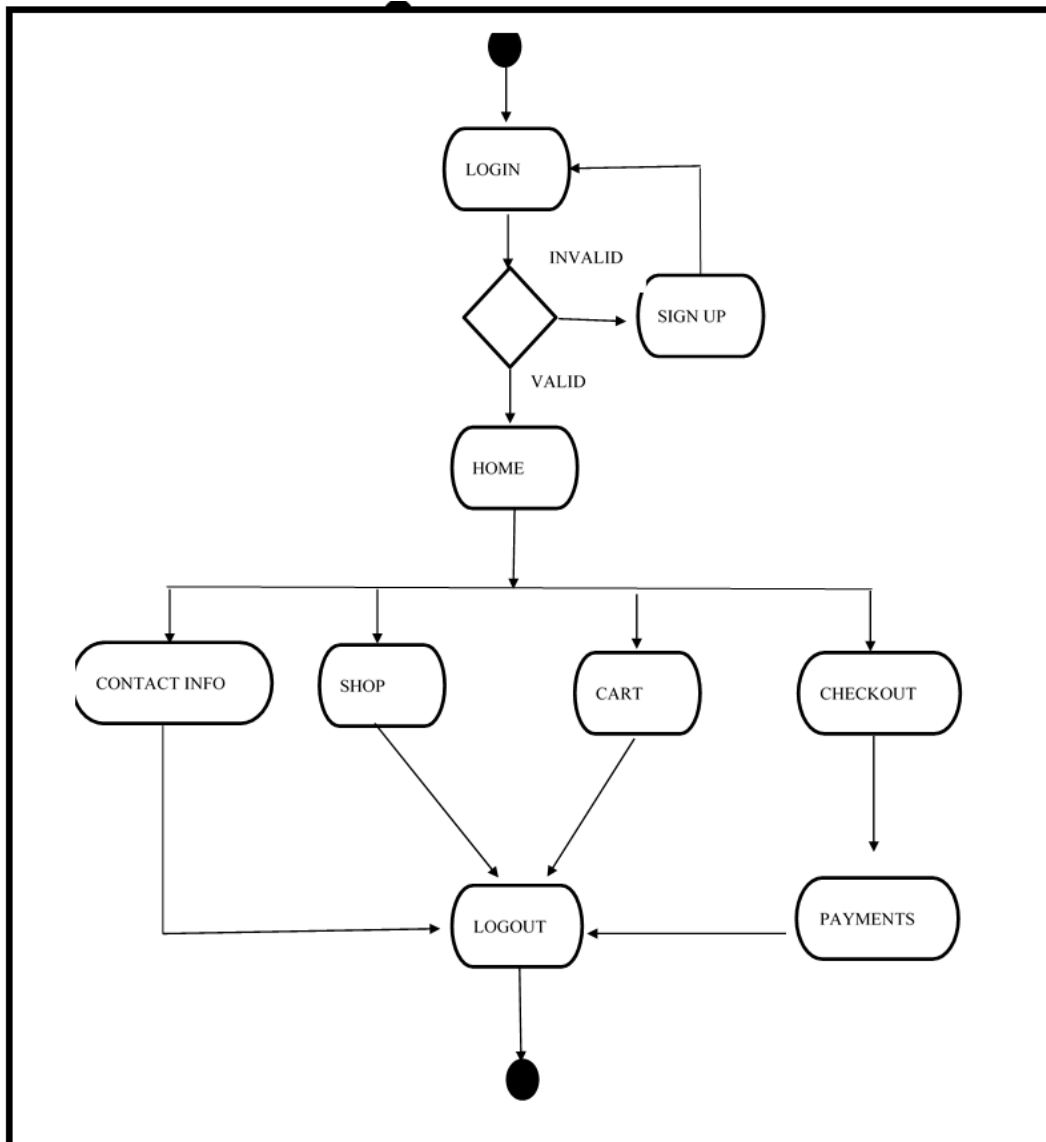
- *Admin can add/ remove products and manage contact info and accounts.*

Post conditions

- *The system will be updated according to changes if made.*

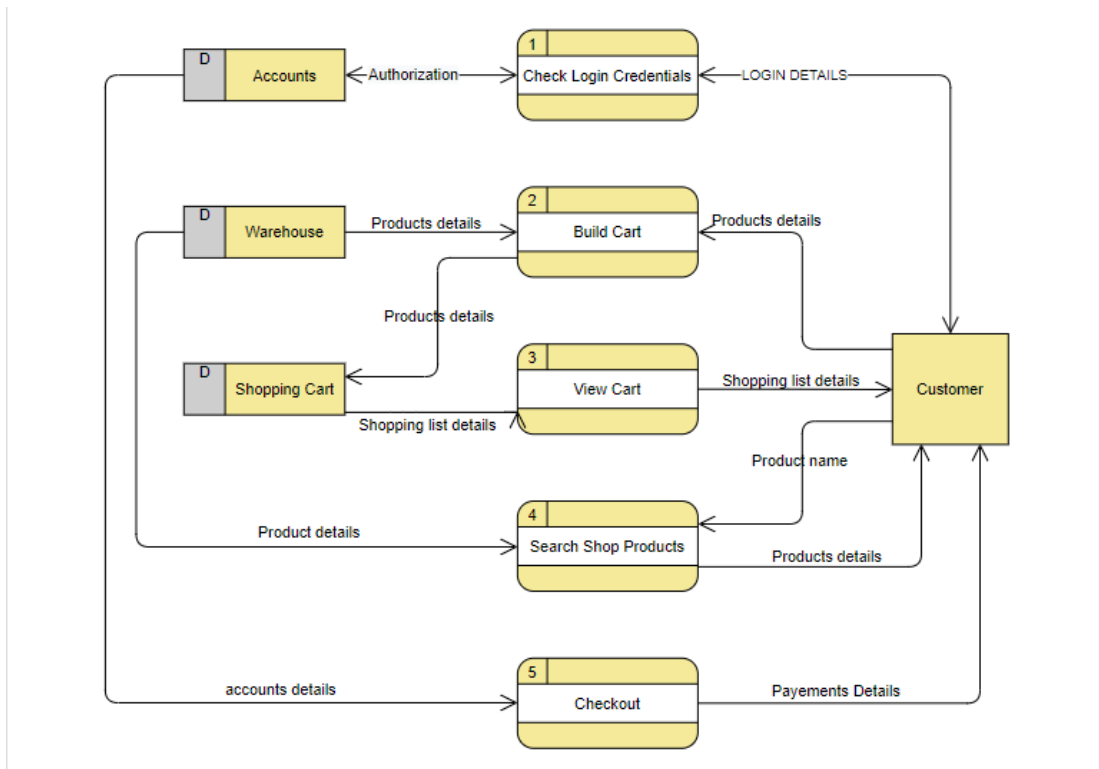
3.1.1.4 ACTIVITY DIAGRAM

The diagram below displays how the users are logged in the shop and hoe they are going to use the shop for online purchasing or window shopping.



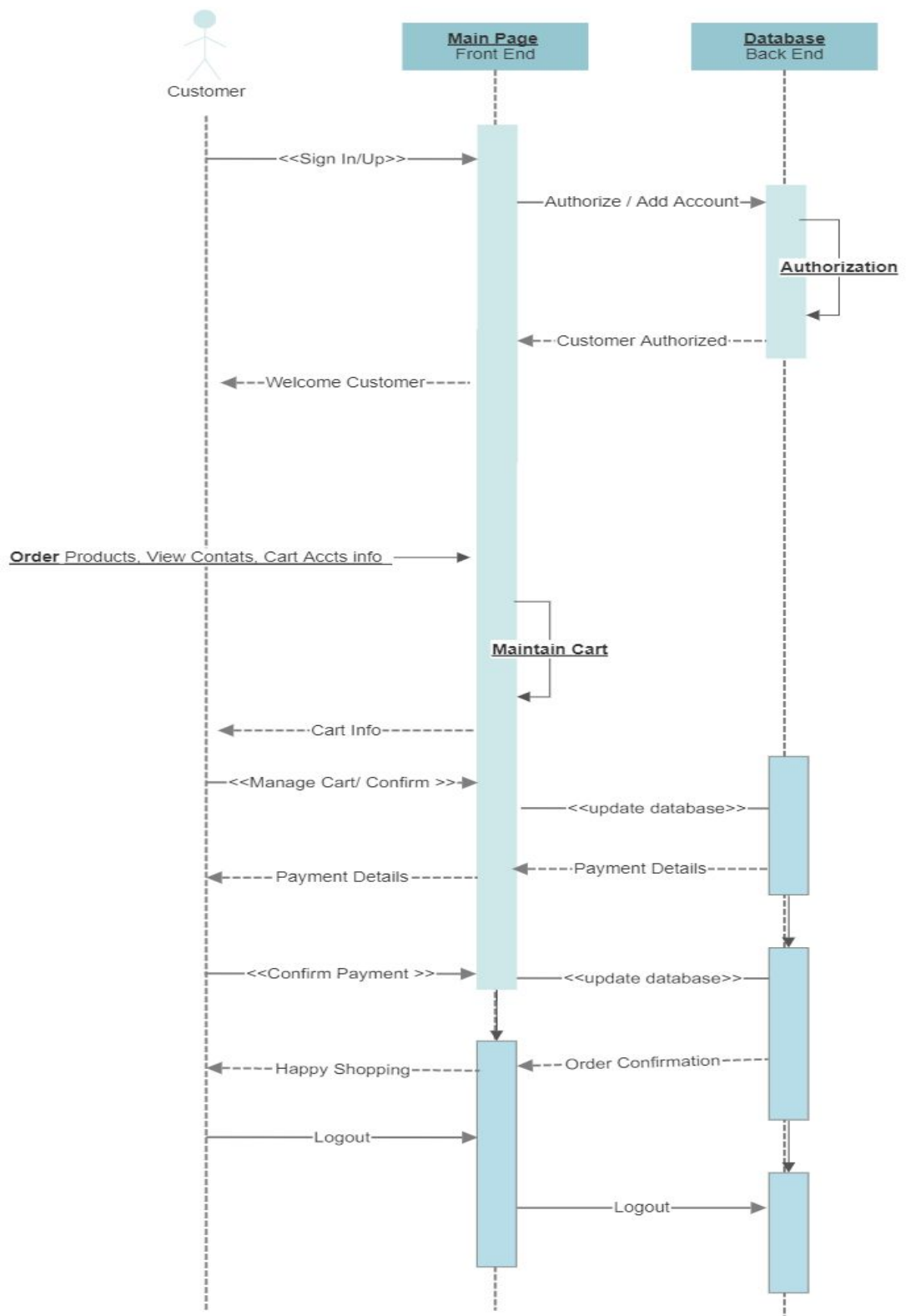
3.1.1.5 Data Flow Diagram

The data flow diagram displays the flow of data and information through all the modules and data storages. It is further divided in customers data flow and Admin's data flow diagram.

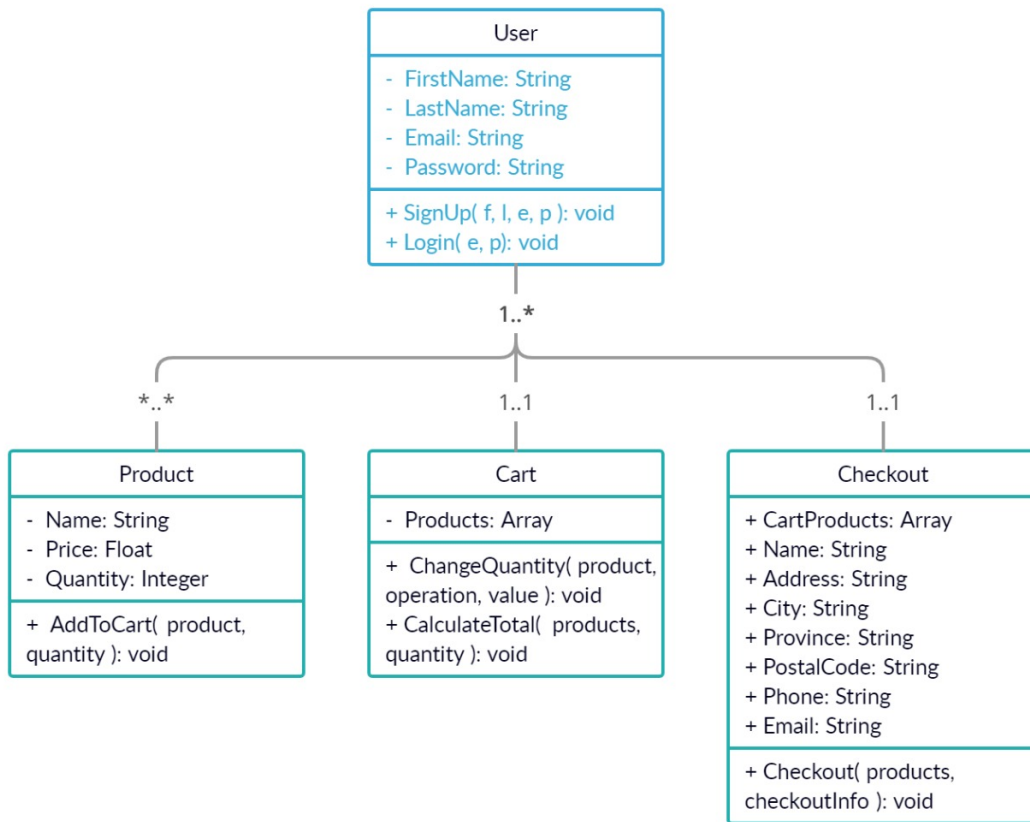


3.1.1.6 Sequence Diagram

Sequence Diagram: Shopping Cart



3.1.1.7 Class Diagram



3.1.2 Design Rationale

At the start we choose bootstrap libraries as our frontend development tool and started working on that but after some time when we learned about JavaScript for frontend, we found it much easier to get along and also it is supported with bootstrap libraries so we got the better of both. State management was way more manageable in JavaScript as this was a critical issue in previous architecture.

CHAPTER FOUR

4.1 Technology Platform

4.1.1 SYSTEM FEATURES

Following are the major functionalities of the project:-

4.1.1.1 React JS

H-Shop will be developed in **React JS** which is a very powerful library of JavaScript to develop single page applications.

4.1.1.2 Google's Firebase

We will use **Google's Firebase** which allows to use its free storage and database (firestore) along with its own authorization for Login and Signup features which will increase its functionality, performance and security.

What will make this application stand out from others is that it has no separate backend.

4.1.2 COMPONENT DESIGN

First, we create the configuration of firebase in our app:

Signup:

```

const Signup = (firstName, lastName, email, password) => {
  const {user} = auth.createUserWithEmailAndPassword(email, password);
  const userRef = firestore.doc(`users/${user.uid}`);

  const snapshot = userRef.get();
  if (!snapshot.exists) {
    const { firstName, secondName, email } = user;
    try {
      userRef.set({
        firstName,
        secondName,
        email,
        ...additionalData
      });
    } catch (error) {}
  }
}

```

Login:

```

const login = (email, password) => {
  auth.signInWithEmailAndPassword(email, password).then(() => {
    // handle after login functionality
  }).catch(error => {
    // handle failed login functionality
  });
}

```

GetUser:

```

const GetUser = (uid) => {
  const user = firestore.doc(`users/${uid}`).get();
  return {uid, ...user.data()}
}

```

AddToCart:

```
const AddToCart = (product, qty) => {  
  // get the cart document from firebase  
  // create an object with product & quantity  
  // push the created object in the cart document  
  // save the document again  
}
```

Checkout:

```
const Checkout = (name, address, city, province, contact) => {  
  // get the cart of the user  
  // generate an object with passed parameters of checkout  
  // add the checkout details to firebase  
  // subtract the quantity in the cart from products  
}
```


CHAPTER FIVE

5.1 HUMAN INTERFACE DESIGN

5.1.1 Overview of User Interface

- Application will be having Login Screen, Signup Screen and Homepage Screen.
- Homepage will be having Header, Slider and footer.
- Header will contain contact, about, cart options
- Slider contain buttons to navigate directly to product page and sales section will navigate user to sale items and promotions.
- Footer will be displaying our contact information & short description of the application
- Product interface have a minimalist design containing product name, price and images. Header & footer will remain same throughout the application.

5.1.2 Responsiveness

In the world of websites and web applications, users tend to access these websites and applications on variety of devices. That device can a computer screen, a tab or a mobile phone. To provide a good user experience and target all audience, we have made our project responsive. If you view it in a large screen or a small screen, everything scales according to the target device.

5.1.3 EmailJS

As we don't have a dedicated backend, we cannot make our own emailing service. So we have used a 3rd party package, emailjs. Emailjs is a very easy to use email service which you can integrate with just your frontend and send emails. We have used this service in two parts of the project, in contact us form and in checkout form. When a user checks out, we will receive an email about the products that user placed an order for.

5.1.4 Screen Images

Following are screen images which comprise of screen shots of either from web view or mobile view to show responsiveness

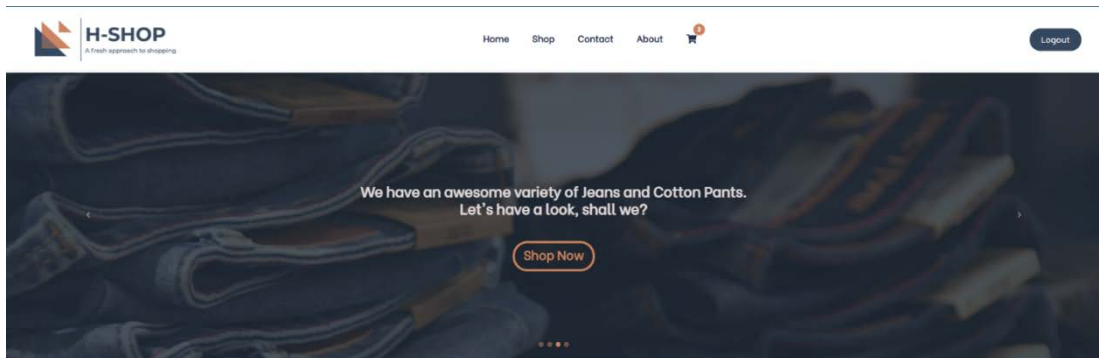
5.1.4.1 Login Screen

5.1.4.2 Sign Up

The new visitor will be having the opportunity to sign up in case he is not having a user email and password to login. By clicking on the sign-up option, the user will be directed to a new page. The user will provide its name, email address and password. After the credentials are authenticated, an email and password will be generated for that specific user to log in.

5.1.4.3 Home Page

The homepage will include a logo, buttons of “Home”, “Shop”, “Contact”, “About”, “Cart” and “Log Out”. The user will have the access to all these buttons while visiting on any page so that at any point they will be able to visit any webpage of their choice without referring to its homepage.



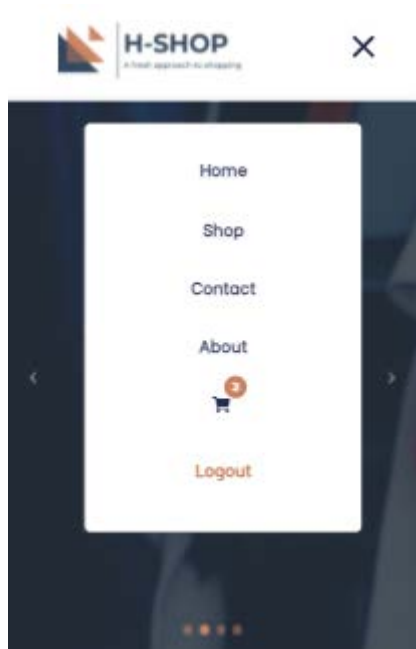
Latest Products



Activate Windows
Go to Settings to activate Windows.

5.1.4.4 Banner and Slider

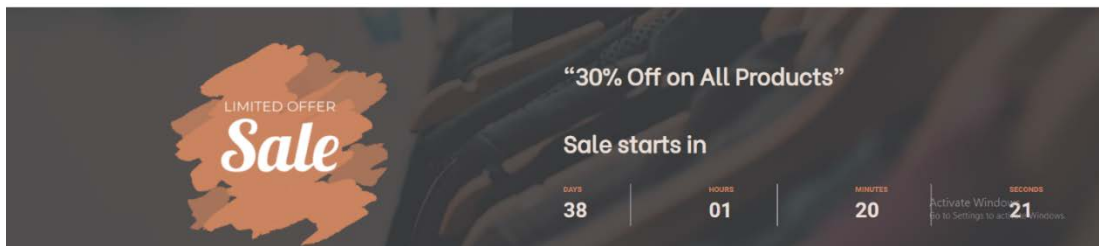
The home page will include a banner which make a user experience more exciting by offering them the deals on the products. In this banner section a slider will also be added so that the user will be provided with the latest updates being made or any upcoming news related to the website.



5.1.4.5 Latest Products

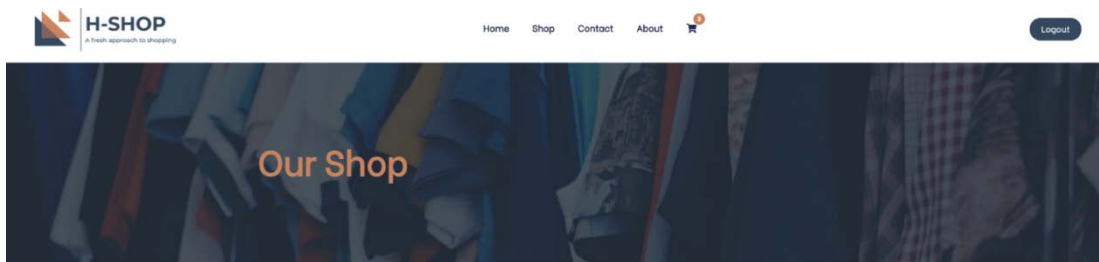
After the banner there will be a section of Latest products which will be added on the website. This will allow the user to access the latest products after they have gone through the banner section. All the products will include their image along with its name description and price. Followed by the Latest Products the user will have the access to the Top-Rated products so that they can directly go to the top trend products.

Latest Products



5.1.4.6 Shop

The Shop page will be listed with the products available with us. Visiting this page will give the user access to see the products available and number of items held with us. The user will be able to select of product of its own choice which will lead directly to cart.



Categories

SHIRTS

(5)

search

Q



Deep Forest Green Texas Polo



Cordovan Maroon Texas Polo




Optic White Texas Polo

Activate Windows
Go to Settings to activate Windows.

5.1.4.7 Contact

By clicking the Contact button, the user will be directed to a page which will include a form to be filled by the user so that the user's queries could be entertained. This form will require a name by the user email and the message which is to be answered.

H-SHOP
A Fresh approach to shopping

Home Shop Contact About 

Logout

Get In Touch

We're here for you, and we're wearing our thinking caps.
Feel free to contact us regarding your queries.

Name...

Email...

Message... (10 character minimum)

Send

H-SHOP
A Fresh approach to shopping

H-Shop © 2021 All rights reserved




Activate Windows
Go to Settings to activate Windows.

5.1.4.8 About

The About button will help the user to understand about the vision and goals set by the team to enhance their experience.

5.1.4.9 Cart

The cart page will have the product picture name quantity price per unit and total price. This page will also have the checkout option and continue shopping.

	Product	Price	Quantity	Total
	Deep Forest Green Texas Polo	Rs. 1490	<input type="text" value="2"/>	Rs. 2980
	Marina Blue Texas Polo	Rs. 1490	<input type="text" value="1"/>	Rs. 1490
	Optic White Texas Polo	Rs. 1490	<input type="text" value="2"/>	Rs. 2980
			Subtotal	Rs. 7450

[Continue Shopping](#) [Proceed to Checkout](#)

5.1.4.10 Checkout

The checkout page will give total details of your product, cost and delivery information for final checkout.

Checkout

You have added 3 products in your cart. Total is 7450

2x Deep Forest Green Texas Polo

1x Marina Blue Texas Polo

2x Optic White Texas Polo

Delivery Information

First Name

Last Name

Email

Address

Phone No.

Checkout

5.1.5 Screen Objects and Actions

5.1.5.1 Home

This button will direct the user to the homepage which is also the default page. After login to the website the user will directly land on this page.

5.1.5.2 Shop

The user will be directed to the Shop page where the user can look for its required products.

5.1.5.3 Contact

This button will direct the user to a new page which will have a form to answer the user query.

5.1.5.4 Send

After the message is typed user will press the send button to forward its message.

5.1.5.5 About

This button will direct the user to the page where the details about the shop will be provided.

5.1.5.6 Cart

This button will lead to a page where the potential buyer has added the items to buy.

5.1.5.7 Log In

This would be on the welcome screen when the url will be accessed. After the user has entered the details about its login, the user will hit the log in button. If the information provided by the user are authenticated, then access will be granted otherwise a message will pop up to enter the valid credentials.

5.1.5.8 Log Out

The user after pressing the log out button will be directed to login page again with having no more access to the website unless login attempt is made again.

5.1.5.9 Proceed to Check Out

After the user is satisfied with its selection “Proceed to Check Out” button will be pressed this will direct the user to another page for confirmation of its order.

CHAPTER SIX.

6.1 System Implementation

6.1.1 Overview

Testing of software projects include different levels of testing to ensure that the software which is being developed is error and fault free. The different levels at which testing was performed is argued here:

6.1.1.1 Unit Testing

It includes the testing of each module at completion.

6.1.1.2 Login Feature Testing

1	TEST NAME	VALIDATE LOGIN CREDENTIALS
2	SCREEN TESTED	Login screen
3	INPUT	Username/ password
4	OUTPUT	Wrong Credentials
5	EXPEXTED RESULT	Authorization
6	ACTUAL RESULT	User not authorized as login credentials were invalid

6.1.1.3 System Reliability Testing

1	TEST NAME	Validate Reliability
2	SCREEN TESTED	Cart/ Checkout
3	INPUT	Selected Order / Customer Address
4	OUTPUT	Confirmation
5	EXPEXTED RESULT	Order Confirmation
6	ACTUAL RESULT	Order is confirmed and User is notified.

6.1.2 CONCLUSION

This project is quite tough as we have been given the opportunity to manage a project from start to finish. It was due to this project we came to know how professional software's are designed. The objective of this project was mainly resolving all these problems and providing the department the facility to run FYP cycle in a timely manner. Everyone will be able to use it. So we have worked on most of the things we have proposed in the proposal to make an efficient and better system which will help the CS department to get evaluation of FYP done. Due to constraints of time and team size, the scope of the project was kept small. Initially we will deploy the system in one department, but its scope can be enhanced with the passage of time. We firmly believe that our project can genuinely bring about a significant change in the performance.

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