



**Tribhuvan University**  
**Faculty of Humanities and Social Science**

**E-Commerce Portal**

**A Project Report**

**Submitted To:**

Department of Computer Application  
PadmaShree International College

**In partial fulfillment of the requirement for the Bachelor in Computer Application**

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**Supervisor's Recommendation**

I hereby recommend that this project prepared under my supervision by **Aavash Ganesh** entitled "**E-Commerce Portal**" in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

.....

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**LETTER OF APPROVAL**

This is to certify that this project prepared by **Aavash Ganesh** entitled “**E-Commerce Portal**” in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

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## ABSTRACT

E-Commerce is the fast growth gaining as an accepted and used business paradigm. The digital version of doing commercial transactions over the internet is in the flourishing way and in the center of attention among the youth. Majorly, the youth prefer buying product through the web and more business house are providing services from the internet.

E-Commerce Portal is a online platform that allow business to conduct commercial transactions with customers. One of the web based system that follow e-commerce business paradigm is e-commerce portal mainly focusing to provide the services of buying and selling of product related to liquor. It is the system through which the customer can order their prefer liquors item through online medium and pay it by online payment gateway. This system is also useful for the people to get information about prices of different liquors items falling under different brands and category. Further, this system recommend other customer using collaborative filtering recommendation on the basis of review provided and taste match. This system is specially targeted to the people who are affectionate of liquors products and want to try and order item of different brands.

**Keyword:** add-to-cart, business paradigm, business-to-customer, commercial transaction, collaborative filtering, recommendation

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## LIST OF ABBREVIATION

B-2-C	Business-to-Customer
CSS	Cascading Style Sheet
DFD	Data Flow Diagram
E-R	Entity-Relationship
HTML	Hypertext Markup Language
JS	JavaScript
MySQL	My Structured Query Language
PHP	Hypertext Preprocessor
SRS	System Requirement Specification
UI	User Interface



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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

E-commerce Portal is one of the web based single vendor e-commerce portal where the process of commercial transactions are carry out over the computer network or internet, in additionally transactions of fund is also be perform electronically. This system follow the business to customer (B-2-C) types of ecommerce business and go after the methodology of business which address the need of business organizations and customers to improve the quality of service deliver at door step.

In the present context of Nepal markets, e-commerce is accepted as fast gaining of business paradigm. More and more business houses are converting their physical services by providing their services online over the web. It is reasonable to say that the market of ecommerce is floursihing and reaching great height day by day.

Before the ecommerce was introduced, customers have to make physical presence in the market in order to buy the liquor products which cost their precious time. So, to make easy access of different liquors item to the comfort of customer doorstep, the idea of e-commerce portal came to exist where the customer can search and order the liquor products that falls under different category and brands like Ruslan Vodka, Nepal Ice Beer etc. and many more from their current location or anywhere they prefer.

This system provide the easy to use interface for the customer who are fond of liquors item and desire to order it through online medium and get deliver at doorstep. Here, in this system three different use cases i.e., admin, customer and visitors are provide with different individual features. Admin have the full control over the content of the system and product are manage by them. Visitor can only view the available product under different categories whereas customer can login into the system and can buy product they want along with online fund transaction. Likewise, admin can view the active customers and order details from their dashboard. Users can review and on the basis of review provide, the system recommend product to other customer which using collaborative filtering recommendation.

## **1.2 Problem Statement**

Before the e-commerce was introduced i.e. back in the 1980s when the time of traditional commercial was popular, customers have to face lots of problem either it may be the costing precious time for shopping or the visiting different shop and paying more cost for getting the product. Not only the customer, but the organization or the society also have to face problem. Through the traditional commercial activities, the organization cannot extend their business to different part of the nation and the society have to face huge traffic or crowd of people due to large customers going to the market.

But if we compare today time with the few year ago, the ecommerce business has flourish rapidly but not to the height it can be at present. The main barrier in the development of ecommerce business in context of Nepal is the difficult to gain trust of customer due to the few ecommerce site delivering low quality of services. One of the problem in Nepali e-commerce is lack of ecommerce law and regulation bodies. High delivery charge and product prices comparing to the market is also another factor of problem which leads to prefer traditional ecommerce from the electronic commerce.

## **1.3 System Objectives**

- To enhance the way of conducting commercial transaction by granting the buying opportunity from the comfort of home and pay through online payment gateway
- To provide the features to search multiple option under the different category related to liquor product and get recommend on the ground of review provide

## **1.4 Scope and Limitation**

### **1.4.1 Scope**

As the term 'e-commerce' is being familiar within the people, the trend of purchasing the item over the internet i.e., market of ecommerce is in hike phase. E-commerce priorities to provide the product more convenient and cheaper rate which generates massive profit and revenue for the people engaged in online business due to which ecommerce is rising to a great scope day by day. Although ecommerce has been in the market for a long time

while now especially in the developed countries, currently it has been growing all over the Nepal as an easier platform for doing business as well. One of the factor in increasing the scope of ecommerce is having a better access to the internet and the other one being the recent COVID-19 pandemic. Ever since the beginning of pandemic, Ecommerce has been a safer means of conducting commerce business transaction online. This show that growth of ecommerce is in leading phase at current moment, which directly benefit the scope of 'theLiquors' which is one of the ecommerce site and falls under the principle of ecommerce which aim is to provide the features of buying of liquor item through the internet and reduce the problem arise and face due to the traditional ecommerce.

#### **1.4.2 Limitation**

- This system does not provide the fund transfer through different payment gateway and invoice details of the product purchase is also not generate
- This system is not made for multi-vendor marketplace where multiple vendor are not allow to conduct their business transaction
- Customer cannot request the refund payment and the tracking order features are also not implement in it

### **1.5 Development Methodology**

As a part of software development, for the e-commerce portal system modified waterfall methodology has been use to minimize risk such as bug, cost overruns and changing requirement when add new functionality. The entire software was development in mechanism that allow to return to the previous phase for verification and validation. Further, the software was design under structure paradigm considering data and process modelling in addition with architecture and database schema design.

## **1.6 Report Organization**

### **Chapter 1: Introduction**

This chapter encompasses the basic introduction to e-commerce portal, problem arises in the current e-commerce market and the demand of e-commerce portal system. It also includes the objectives of the system. In addition, this chapter also covers the scope and limitation of the system. Furthermore, the methodology for development and report organization was also considered in this chapter.

### **Chapter 2: Background Study and Literature Review**

Under this chapter, the information regarding the background of e-commerce along with their flourishing period are covered. Likewise, the review of existing systems similar to e-commerce portals are included to find out flaws and include in this system.

### **Chapter 3: System Analysis and Design**

Here, all the system analysis and design components are included in this chapter. Different software requirements i.e., functional and non-functional requirements and various feasibility studies are also encompassed in the system analysis part.

### **Chapter 4: System Implementation**

Different tools used for implementing the system like CASE tool, programming language, database platforms are included in this chapter. Similarly, testing of different modules and testing as a software are also shown here.

### **Chapter 5: Lesson Learnt/ Outcomes**

In this chapter, the lessons learnt in the software development process, system outcomes and conclusion are noted here. Likewise, the future recommendations and enhancement part from the developer perspective are also described under this chapter.

## CHAPTER 2

### BACKGROUND STUDY AND LITERATURE REVIEW

#### 2.1 Background Study

The history digital version of doing commercial transactions over the internet in world began with the foundation of CompuServe in 1969. In 1984, the same company believe to be the first major ecommerce enterprise of the world after launched of electronic mall that allowed its users to buy from more than 100 online retailers/merchants. However, the history of e-commerce in Nepal start from 1998 when the thamel.com launched as a business listing website with an aim of gloabalising and digitising the business of the shops located at Thamel. Since, the thamel.com site provide online chat platform for potential buyer and seller to communication and doesnt follow business paradigm of e-commerce site. So, it was not consider as a e-commerce site rather it was known as a communication platform. But a year later as a first e-commerce in Nepal was started when Send Gifts to Nepal was setup with the help of people residing abroad who sent gift to their loves one. Although this was not exactly ecommerce based but it gave a snap what exactly buying things online looks like. Later, the platform like Muncha.com, Giftmandu etc. create but couldn't get their expected popularity because Nepalese were just getting familiar with the internet. [1]

Recent research show ecommerce in Nepal is growing as people are being familiar with the internet and even look more promising. The ecommerce market started to grown up when the Kaymu.com started their business activities in Nepal. Later when the Kaymu company was acquired by Daraz group, the trend of ecommerce became more popular and achieve the trust of Nepalese, it started to grow rapidly. Other factor that helps to driven ecommerce was also the COVID-19 pandemic where people have to buy the grocery and other essential products, from the ecommerce site. As the growth of ecommerce portal started slowly and there are thousands of officially registered ecommerce portal, but it is still in nasty condition due to lack of infrastructure related hassel like lack of digital mapping, strong legal provision, however few of the ecommerce site are trustable and have an asserted as an established commercial website.

## 2.2 Literature review

A literature review is a comprehensive summary of previous research on topics by authorized scholars and researchers regarding of what has been done before on the topics. The purpose of the literature review is to express and enumerate, summarized what ideas have been established and what their positive and negative aspects. Keyword search on 'E-Commerce in Nepal', 'Background of E-Commerce for Nepal' in various site within the web found the following data.

According to the article publish in Privacy Shield, described how widely e-commerce is used, the primary sectors that sells through e-commerce and how much product in each sector is sold through commercial transaction versus brick-and-mortar retailer. In additional, including what a company needs to know to take advantages of e-commerce in the local market and reputable ,prominent B2B websites. As per their report, mostly e-commerce activities are concentrated in Kathmandu and other cities with little market area in rural part. Due to which e-commerce is still in its infancy state. The country challenging because of lack of street address to make a deliveries. Credit card transfers and transfer from e-banking websites are sometimes accepted, but Nepalis who havenot access to dollar card cannot make payment using foreign currency. Moreover, Nepal's e-commerce intellectual property rights laws and regulations are outdated, ineffective, and sporadically enforced. [2]

Yet, Nepal cannot order from India-based and other world-wide popular website like Flipkart.com, Amazon etc. due to less payment option and tightly regulated of money outsourcing. However, some of the enterprenur maintain websites that promise to deliver merchandise order from Indian website but the operational status of these business is unclear and they doesnot appear to be widely used.

As per Krishana Prasain, article publish in Kathamndu Post state that the wave of coronavirus pandemic create a significant uptick in e-commerce site . The number of Nepali e-commerce users started picking up after the first lockdown as people were grounded at home, a rising number of consumers started shopping online. Though the markets opened after they stay-home orders were withdrawn but e-retailers were successful in retaining their customers and their business didnt decline. E-commerce



entrepreneurs said that demand for online service was high after lockdown phase as people had become more confident and trustful about the services provided by e-retailers. The growth is supported by multiple factor like rising adoption of social commerce, faster and timely deliveries and rising adoption of digital payment coupled with greater internet penetration. [3]

As the lockdown has benefit a lot in developing e-commerce trend but with the respect to the current day and ages, E-commerce in Nepal still faces some major hurdles in its growth and it is due to major challenge i.e. education/awareness of ecommerce advantage. Education and awareness are the two sides of a coin. As e-commerce is a modern concept involving computer of internet usage, the proper outreach of the education among the general mass of Nepal is not helping the cause. Another challenge in e-commerce is payment gateway system which is still at its infant state in Nepal. This has severely limited the system of online payment which is one of the vital components of the e-commerce business. We still are long way away from having a proper and reliable online payment system mainly for international transaction. Likewise, another problem in e-commerce market is few business providing e-commerce service due to which there is not much competition among them. More service provider means more healthy competition among them to gain trust of general people. Delivery and return of the products is also leads to one of the obstacle in growing ecommerce that still exist in Nepalses market. Due to lack of location description it is sometime very difficult to deliver ordered goods in right place.[4]

Study by Raven examined and compared India and Nepal's approaches in adoption of e-business. Based on the literature survey and secondary data, the study analysed various factor influencing the growth of e-business in two countries. The factors examined included government policy and focus, existing technology infrasturcture regulatory environment, experience and understanding of business operations, and culture, among others. The study concludes that India appeats more ahead of Nepal in infrastructure, and more it stated that both countries are poised for rapidly increasing e-business. However, problem of poverty and inequality between urban and rural connectivity must be resolved to really take advantage of e-business in both the countries. [5]

Originally, Kaymu currently known as Daraz was launched in Nepal on may 2014. With its launch in Nepal, it totally changed the shopping experience for most of the people. Most of the online shopping facility and experience was also brought in Nepal. Later, in July 2016, Daraz Group took Kaymu and began to run services. In May 2018, Chinese e-commerce company Alibaba Group acquire Daraz. Daraz provides an excellent customer experience, ease-of-purchase, comprehensive customer care and hassle-free shopping and offers a diverse assortment in categories ranging from consumer electronics to household goods, beauty, fashion, groceries and many more.

Sastodeal is one of the leading eCommerce companies in Nepal which started their activities from December 2011. Starting the services from small garage to provides services to millions of customers and thousands of vendors all over Nepal, Sastodeal have come far in forming the logistic network that ensures deliveries in most parts of the nation and ensures the users can buy products at affordable prices, get their products delivered as assured and on time regardless of their location. [6]

Sochek.com, a renowned business providing services for the last 20 years has aimed to provide one-stop solution for all the user need on different categories from groceries, clothing, home and living to the automotive and electronic gadgets. Socheko provides the high quality and right products on the right way precisely at the doorstep. [7]

Another famous ecommerce site providing services in Nepal is the smartdoko.com, a subsidiary of IMS Group. It provides a simple and safe platform for ecommerce transaction for both customers and vendors and shop from the comfort of their homes. [8]

Reviewing different e-commerce software existing in the market, it was found that mostly all the software was design with the purpose to provide service related to buying and selling of product to the customer. Mainly, most of the top e-commerce site in Nepal provide multi-vendor services with different product section along with tracking order features. However, the e-commerce portal is the basic e-commerce site mainly for buying of product related to the liquors by the customers and is single-venor site i.e. it doesnt provide multi-vendor services. It also doesnt provide order tracking and invoice generation features for now. But this feature need to be implement while enhancing it.

## CHAPTER 3

### SYSTEM ANALYSIS AND DESIGN

#### 3.1 System Analysis

This project is designed for developing e-commerce portal mainly for providing the services of ordering the product of liquors categories from doorstep by the customers. So, in the process of system designing, different steps were taken as consideration. Among the different step, the major steps was of system analysis. Different functional and non-functional requirement gathering and feasibility study was carried out as a part of system analysis. Similarly, process modeling, data modeling are also drawn for analyzing and develop it according to the requirement.

##### 3.1.1 Requirement Analysis

Requirement analysis describes what the system should perform and what the expectation of the users to the new system. It includes the identification of end users' need and preparation of a corresponding document term as software requirement specification (SRS). Before starting the development of the new system, the following requirement are taken into consideration.

##### i. Functional Requirement

**Table 3.1: Functional Requirement of E-Commerce Portal**

S.No.	Req Id	Requirement	Description
1	R-1	Account Registration for customer	Customer should be able to create their account for accessing this system
2	R-2	Login Section	Admin and Customer should be able to log in to this system after matching their credential
3	R-3	Manage Category, Sub-Category and Brands	Admin should able to manage category, sub-category and brands where add new

			data, modify existing and deleting data can be performed
4	R-4	Category Section	Category section should contain information and list about different category of product
5	R-5	Sub-Category Section	Sub-category section should contain list of sub-category data under different category data
6	R-6	Brands Section	Brand section should contain all the brand name whose product are available for purchasing
7	R-7	Manage product section	Admin must be able to manage product section (Add new product, modify the existing product and delete it)
8	R-8	Product section	Product section should contain all the product available for ordering with the featured image, price and description of product
9	R-9	View customer	Admin should be able to view the customer details except the password which is provided while account registration process
10	R-10	Add-to-cart section	Customer should be able to order the product by adding it into cart section for checkout and payment process
11	R-11	Payment section	Customer should be able to pay online using payment gateway for confirming the order
12	R-12	View order	Admin should be able to view all the order details while customer should only be able to view their respective order
13	R-13	Modify account details and change password	Admin and Customer should be able to change the existing password with the new one whereas customer can only modify their details used while account creation

## **ii. Non-Functional Requirement**

- **Security:**

The e-commerce system named as e-commerce uses md5 technique for password encryption and must be at least seven character password as a parameter for security.

- **User-friendly:**

The system is designed with the interface which will be friendly and easy to operate and provide maximum optimization for smoother performance. Customer with basic knowledge of internet can use this system. The system uses a simplified interface and simple content language to improve the user friendliness.

- **Easy Access:**

As the system is deployed over web and can be accessed through the internet, so anyone with the internet facility can easily use this system.

- **Maintainability:**

From the developer perception, this system is easy to maintain as code are written in clean and readable manner for future maintenance.

### **3.1.2 Feasibility Analysis**

For the feasibility analysis, the study of technical, operational, economical and schedule feasibility were conducted:

#### **i. Technical Feasibility:**

This system is technically feasible as the technical resources available to implement ideas or propose system to real software is easily accessible. For this system development, the hardware and software was within the current technology as this project was designed with the open-source and free tool and the hardware requires for coding and deployment was also present and have not issue with hardware infrastructure.

## ii. Operational Feasibility

This system is feasible towards the operation as it is easily accessible due to the available of users friendly interface and the basic knowledge of web and computer is sufficient to access it. In additional, this system performed all the operations functional requirement the system should do and includes all the requirement need.

## iii. Economic Feasibility:

From the developer's perception, we use open source development tools and did not find any economic difficulties in this project. Similarly, the cost of development is within the determine budgets. So, the system can be term as economically feasible and cost effective in nature.

## iv. Schedule Feasibility:

On the basis on the prior experience, this project was completed within 4.5 month time phase. This below table show the time needed for software development project and concluded as software have no issued and is timely feasibility in essence

**Table 3.2 : Gantt Chart for E-Commerce Portal**

System Development TimeLine										
Tasks	15 <sup>th</sup> March	30 <sup>th</sup> March	15 <sup>th</sup> April	30 <sup>th</sup> April	15 <sup>th</sup> May	30 <sup>th</sup> May	15 <sup>th</sup> June	30 <sup>th</sup> June	15 <sup>th</sup> July	30 <sup>th</sup> July
Planning	■									
Analysis		■								
Literature Reviewing		■								
Project Proposal			■							
UI Designing				■	■	■				
Backend Coding						■	■	■		
Testing									■	■
Documentation	■	■	■	■	■	■	■	■	■	■

### 3.1.3 Data Modeling (ER-Diagram)

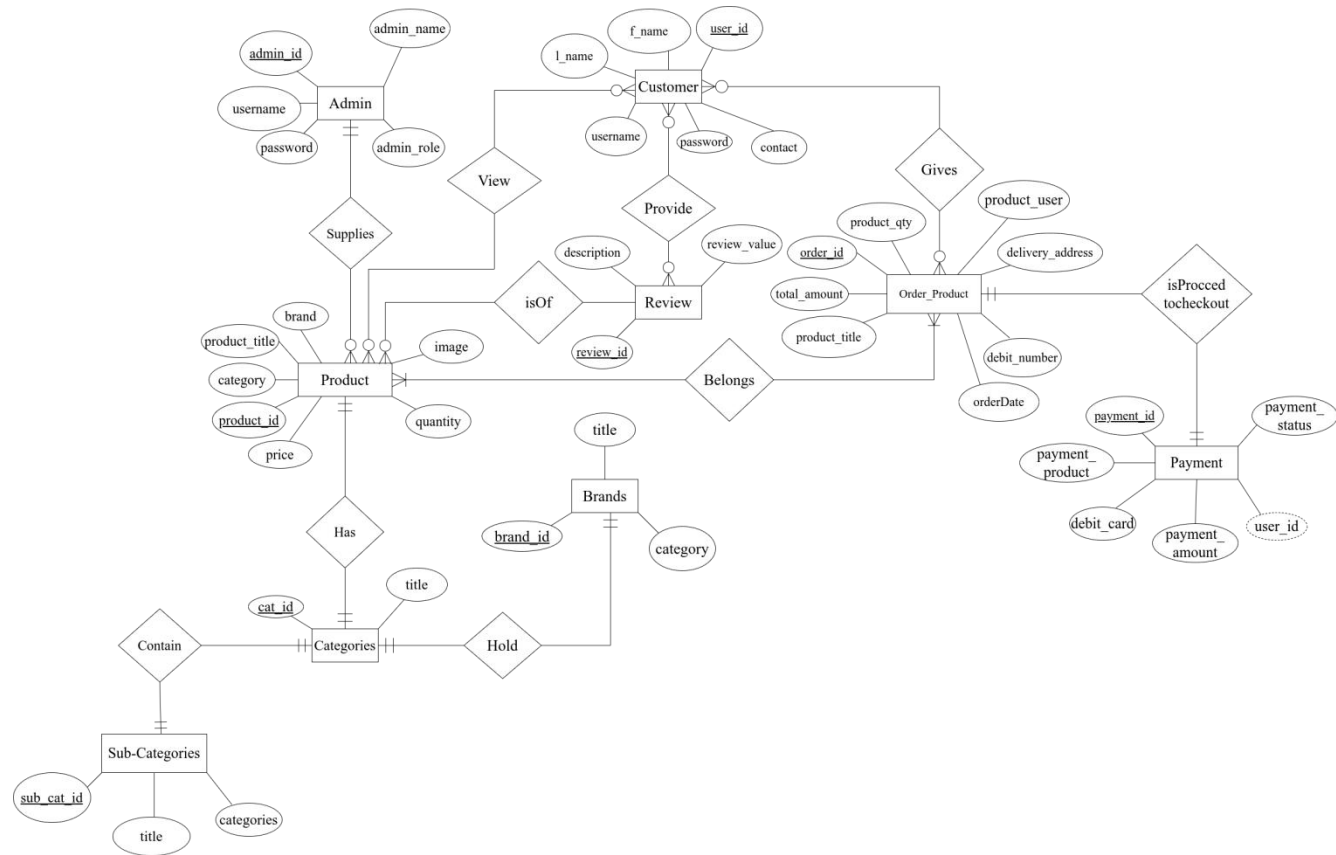
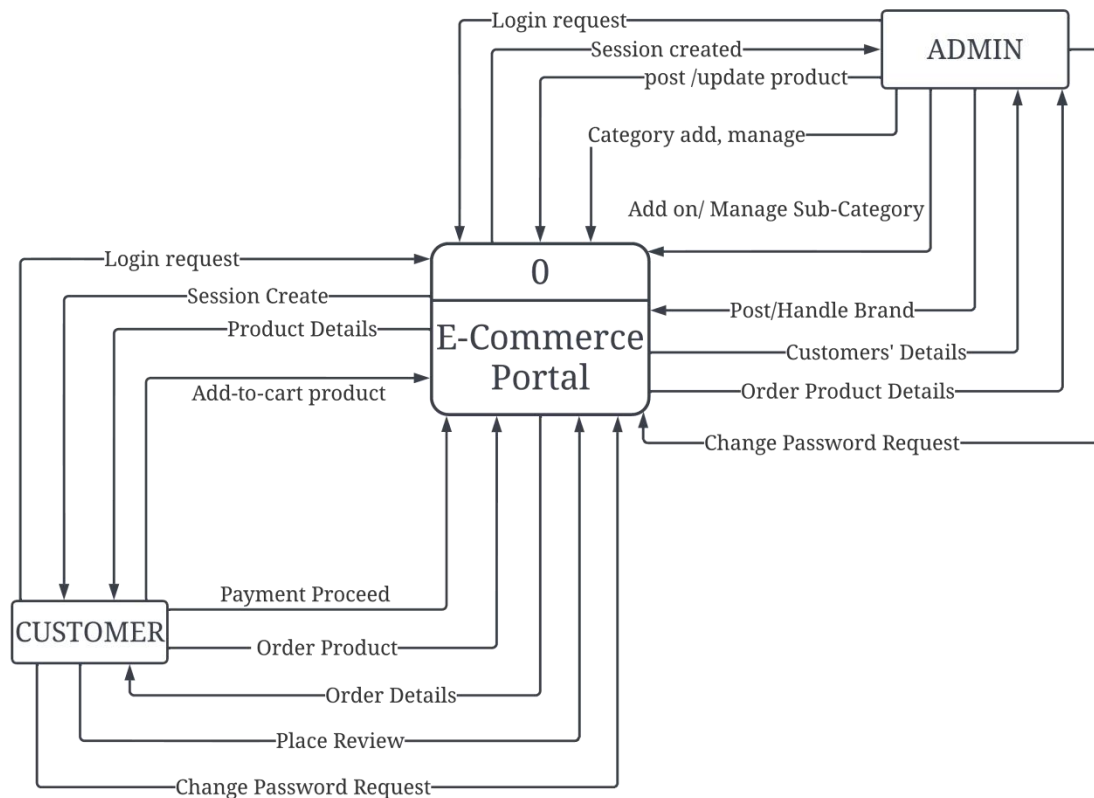


Figure 3.1: E-R Diagram for E-Commerce Portal

The figure 3.1 shows the entity-relationship diagram for E-Commerce Portal. Here, in this portal admin, product, category, sub-category, brand, customer, order product, payment and review are entity along with the different attribute. Single admin can supplies multiple product details. However, one product can have only one categories. Likewise, categories also can hold only one brand and sub-categories at a time. Customer can outlook and order different order. But product are placed for ordering after having payment transaction. In additionally, order product belongs to product and customer can placed review however review belongs to product.

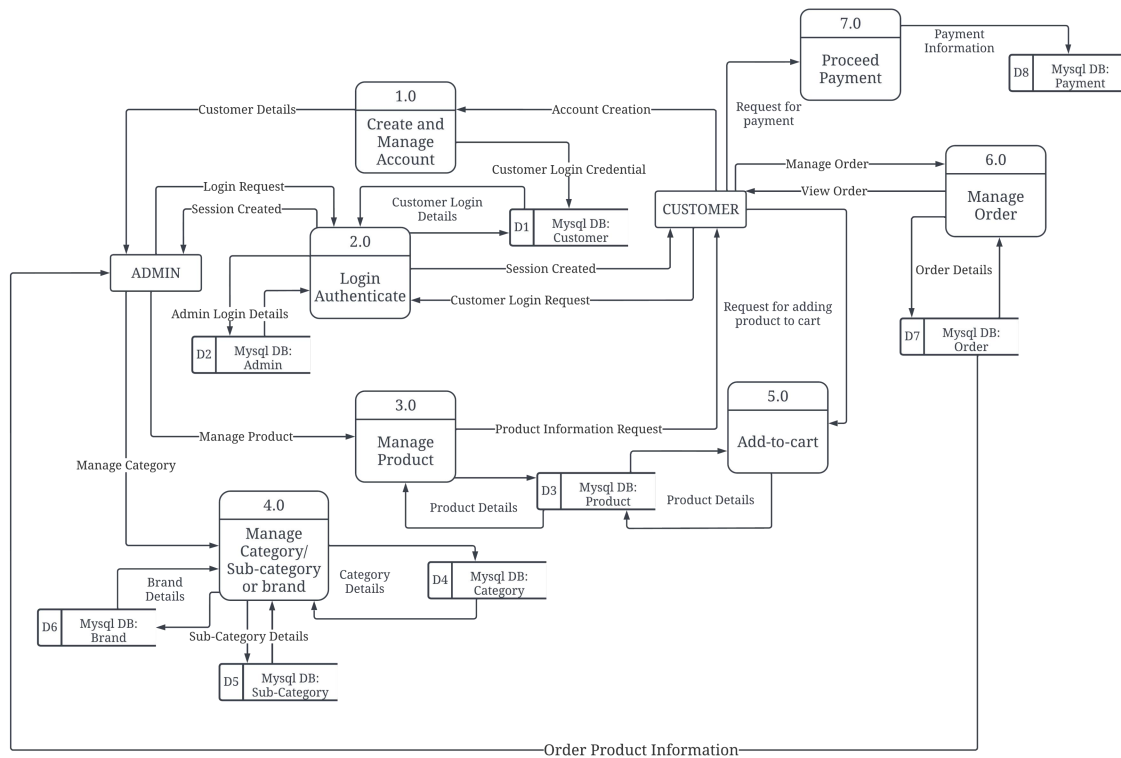
### 3.1.4 Process Modeling (DFD Diagram)



**Figure 3.2: Context Level Diagram for E-Commerce Portal**

The figure 3.2 shows the context level diagram of E-Commerce Portal. Here, the admin and customers are external entity that focus and shows how it interact with the system. Admin and customer both need to log in in order to access their respective portal. Admin have key role responsible to post and manage product details. Likewise, the admin itself is authorize to handle the category, sub-category and brands details. Moving towards the customer entity, customer can view the product and can add it to cart section for ordering. However, to order product firstly the payment need to be done. After the completion of payment, order is placed. Both the customer and user can view order details but the difference is that customer can view only their order history and admin can view all the order history. Lastly, both the admin and customer can change the password of their ones.





**Figure 3.3: Level 1 DFD Diagram for E-Commerce Portal**

The figure 3.3 shows the level 1 DFD diagram of E-Commerce Portal. Here, customer and admin are the entity, process are from 1.0 to 7.0 and data store from D1 to D8. Primarily, the process 1.0 is responsible for creating and managing customer account which store data in D1 datastore named as customer. Process 2.0 is responsible for both admin and customer to authenticate the login credential to access system. Furthermore, process 3.0 is authorize for managing product which data are store in product named datastore. Process 4.0 is responsible for managing category, sub-category and brand however data are store in different datastore named as D4 category, D5 subcategory and D6 brand respectively. Likewise, process 5.0 is responsible for adding product to cart and this process used the product datastore for fetching data. Process 6.0 is liable for customer to place the order and is store in datastore name as D7 order and the order history can also be view by admin. However, order are placed only after conducting payment transaction which is done by process 7.0 and responsible to store it in datastore termed as D8 payment .

## 3.2 System Design

As the detailed study of available system similar to our concept was done and after consulting with the customer, we came in the result to design the system on the basis of the demand and requirement from those who are facing difficulties to get liquors product under single roof and get deliver at doorstep.

By considering the demand and requirements of customer, we decided to develop e-commerce portal where admin will be managing category, brands and product details and the customer will have access of product to order it and pay online as well as provide review and get recommendation on the basis of review provided/ taste match.

### 3.2.1 Architecture Design

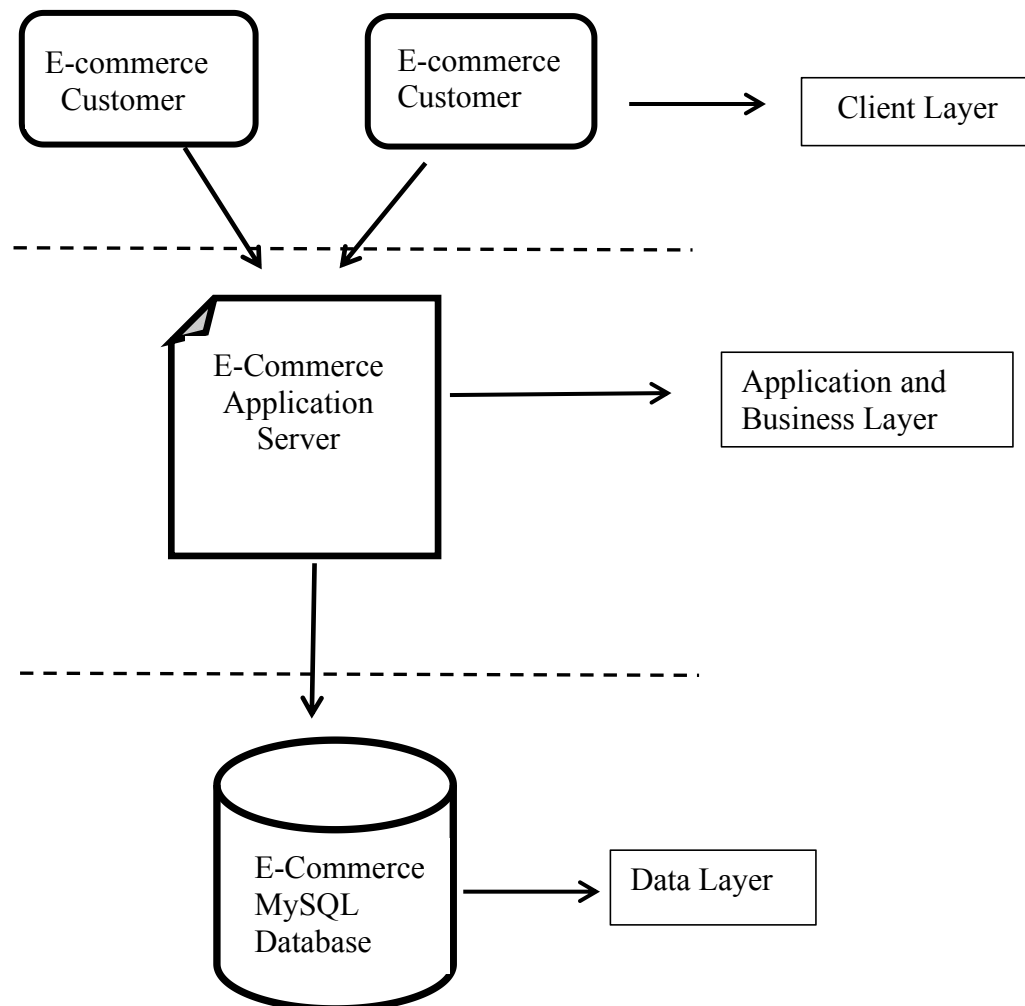


Figure 3.4: Architecture Design of E-Commerce Portal

The figure shows the architecture design of the e-commerce portal which includes the 3 tier as:

**Client Layer:** In this layer, the customers use the interface of the e-commerce portal and send the query through the application layer

**Application Layer:** All the query of the users are process here for the e-commerce portal and acts as a layer for communicating with the database. Here, all the form validation, query of the users are take place and after all the processing is done, it send to the data layer.

**Data Layer:** From here, the user request data are fetch and provided.

### 3.2.2 Database Schema Design

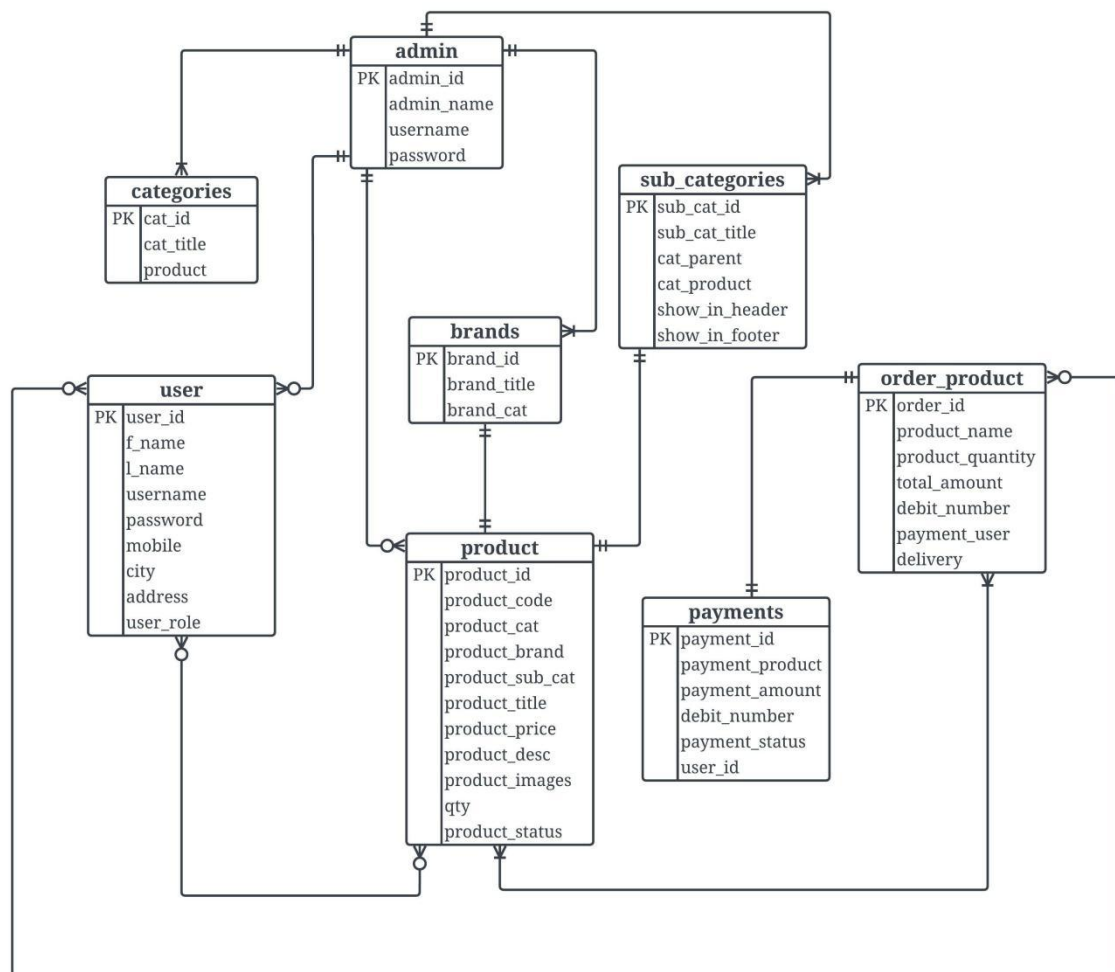


Figure 3.5: Database Schema for E-Commerce Portal

### 3.2.3 Interface Design

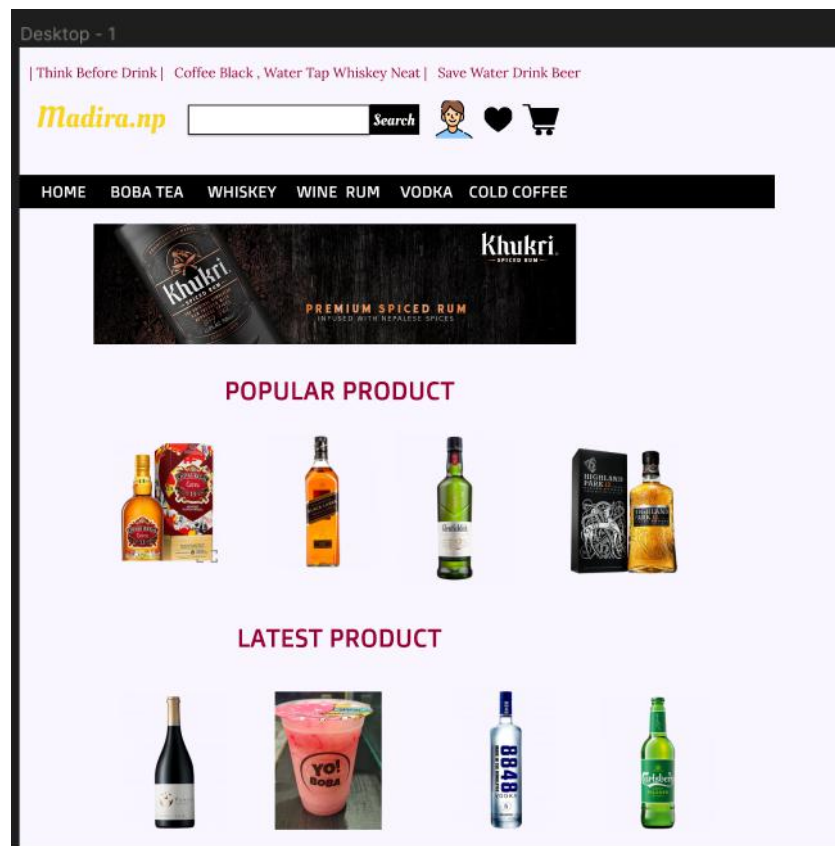


Figure 3.6: Figma Design of Visitor Page for E-Commerce Portal

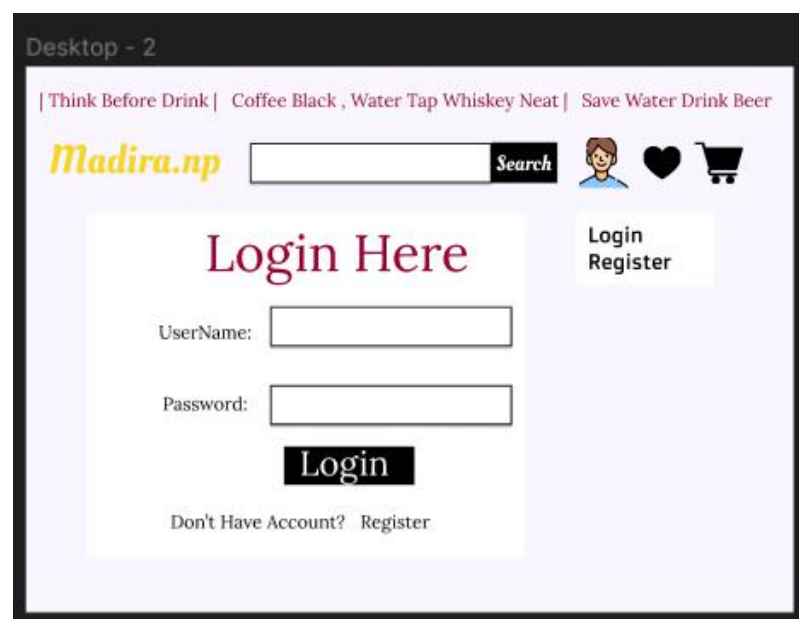


Figure 3.7: Figma Design of Login Page for E-Commerce Portal

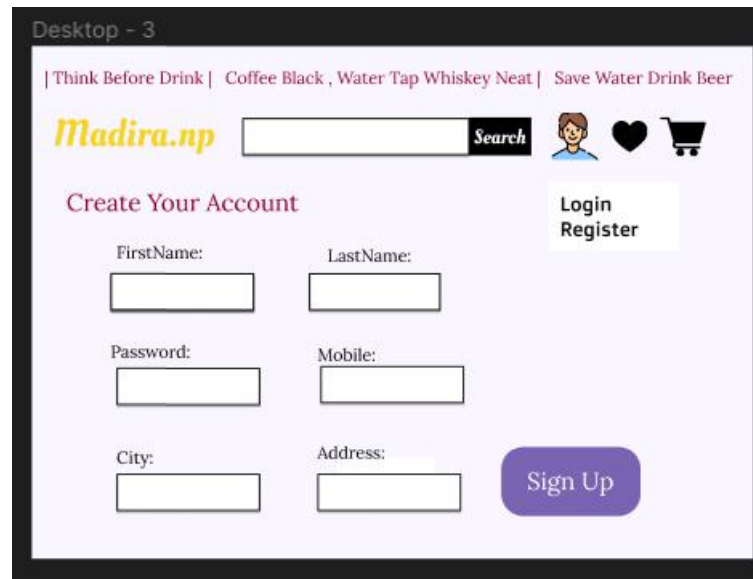


Figure 3.8: Figma Design of Registration Page for E-Commerce Portal

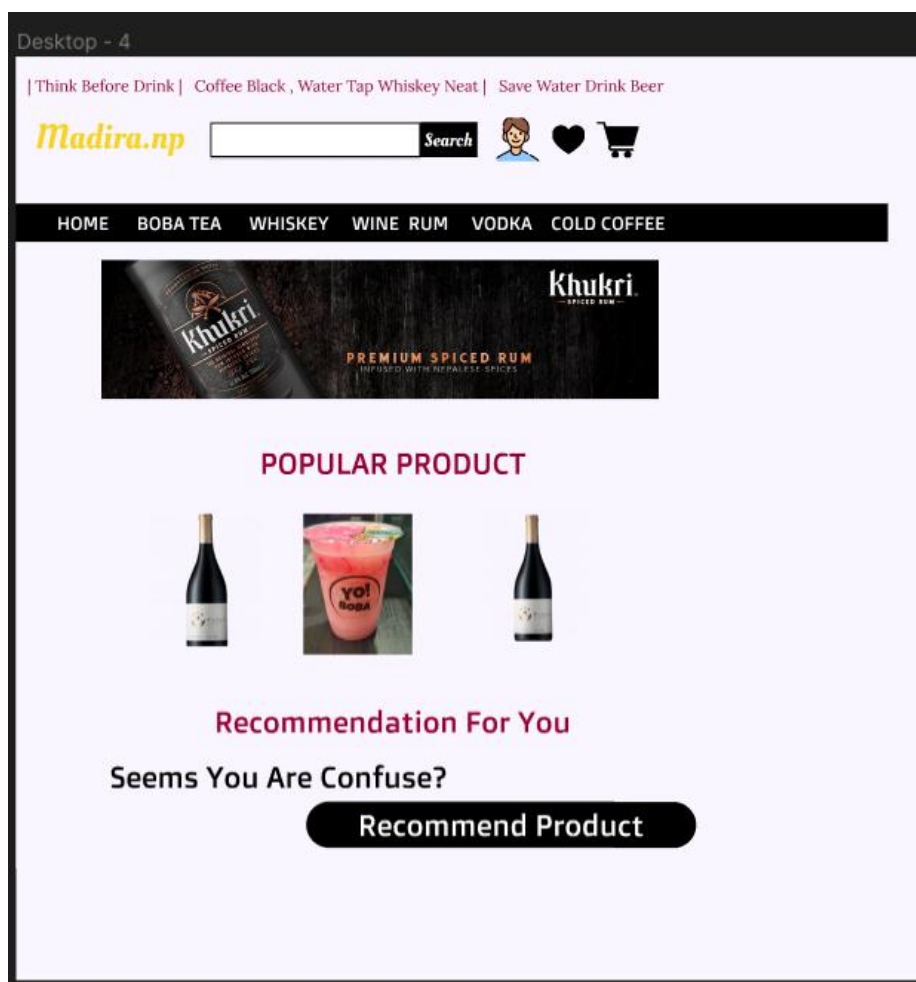


Figure 3.9: Figma Design of Customer Page for E-Commerce Portal

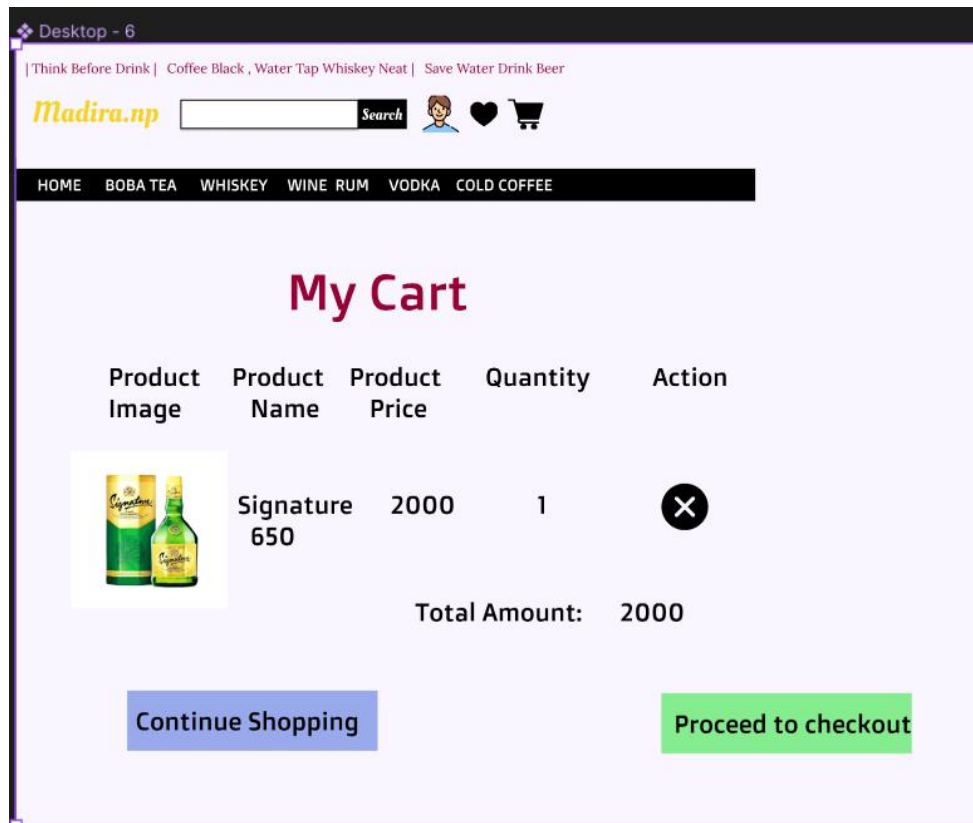


Figure 3.10: Figma Design of Add-To-Cart Page for E-Commerce Portal

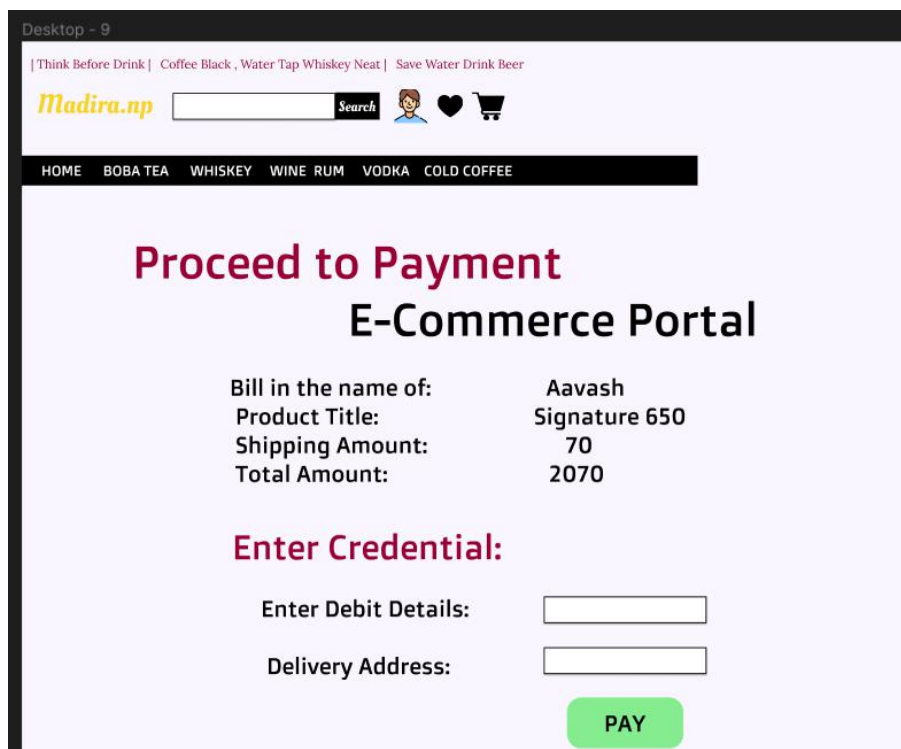
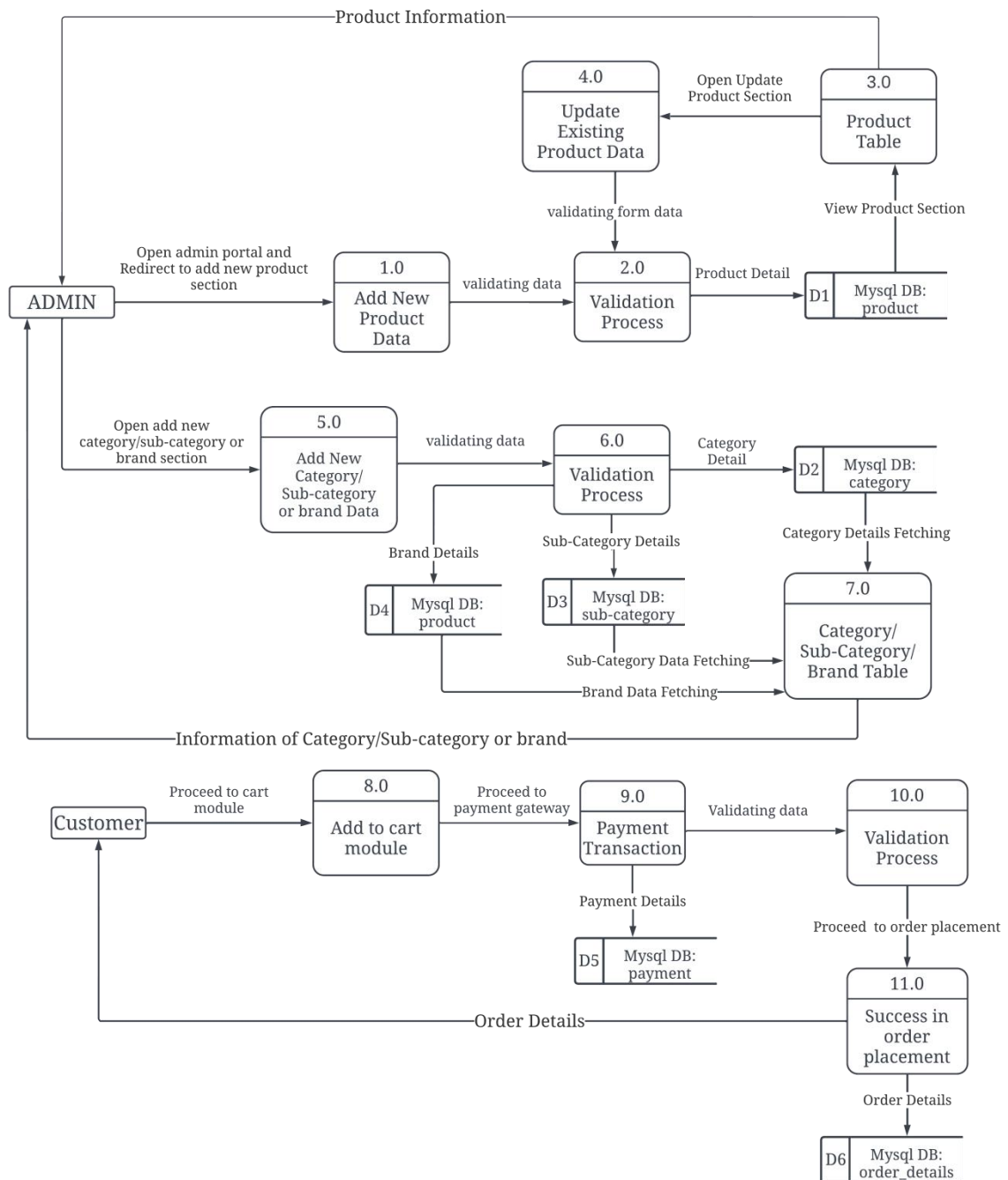


Figure 3.11: Figma Design of Payment Page for E-Commerce Portal

### 3.2.4 Physical DFD



**Figure 3.12: Physical DFD for E-Commerce Portal**

The figure 3.12 shows the physical DFD for E-Commerce Portal. In this physical dfd, admin and customer are external entity, process are from 1.0 to 11.0 , and data store from D1 to D6. Data of product, category, sub-category, brands and payment transaction are store in database after successfully validating it through validation process. Order placement are done after successful in payment transaction and validating payment details.

### 3.3 Algorithm Details

For this e-commerce portal, we have used collaborative filtering recommendation system. Collaborative filtering is a process of making automatic prediction filtering about the interests of a user by analyzing other user's choice or preference.

Here, the collaborative filtering using the Pearson correlation method where a similarity score between two people is calculated on the range of -1 to +1. If the similarity score will be on the range of +1, then it means two people are a perfectly match. If the similarity score will be 0, then it means no match where as if the similarity score will be as -1, the customers are negatively similar.

The similarity score could be obtain using the formula of Pearson correlation i.e.;

$$\text{Pearson}(x, y) = \frac{\sum xy - \frac{\sum x \sum y}{N}}{\sqrt{(\sum x^2 - \frac{(\sum x)^2}{N})(\sum y^2 - \frac{(\sum y)^2}{N})}}$$

Here, x denotes the preferences from person one

y denotes the preferences from person two

N represent the number of item in preferences

Let's understand the working principle of collaborative filtering alogrithm with the below dataset. Assuming four different person are valid customer of our e-commerce portal and reviewed the different product in the system. Now, The review data are fetch in multidimensional associative array from database and hold in review variable as dataset.

```
$reviews = [];
```

```
$reviews['aavash'] = ["Gorkha Beer" => 5, "" => 5, "Signature Premium" => 4, "Jack Daniels" => 4.7, "Ruslan Vodka" => 3];
```

```
$reviews['bipasha'] = ["Cold Coffee" => 3, "Choco Brownie Boba" => 4, "Gorkha Beer" => 5, "8848 Vodka" => 4];
```

```
$reviews['jenish'] = ["Tuborg Beer" => 5, "Gorkha Beer" => 4, "Old Durbar" => 2];
```

```
$reviews['dinesh'] = ["Tuborg Beer" => 4, "Oak" => 3, "Khukuri Rum" => 4];
```



Now, the collaborative filtering recommend the product to customer on the basis of taste match considering the review provide by invoke the `getRecommndation` function. This below shown function will execute to calculate the similarity score in the result of -1 to 1 between customer which take review array as first paramter and person name as another parameter. For e.g. `getRecommendation()` take whole array and 'aavash' as parameter for the first phase and execute the code but in middle other function name `pearsonScore()` will be call which take array as first parameter, 'aavash' as second and 'bipasha' as third paramter to calculate the similar score. Through calculating process, let's assume similar score value is 1 which means they both taste match and it return 1 to the `getRecommendation()` function but if the person1 is equal to person2 or the similar score value is less or equal to 0, then the score is calculated with the other person. To understand more clearly, lets study the below code:

```
function getRecommendations(array $reviews, string $person): array {
    $calculation = [];
    foreach ($reviews as $reviewer => $products) {
        $similarityScore = pearsonScore($reviews, $person, $reviewer); Here, the pearsonScore
        function are call to calculate similarscore using pearson correlation formula
        if ($person == $reviewer || $similarityScore <= 0) { continue; }
        foreach ($products as $product => $rating) {
            if (!array_key_exists($product, $reviews[$person])) {
                if (!array_key_exists($product, $calculation)) {
                    $calculation[$product] = [];
                    $calculation[$product]['Total'] = 0;
                    $calculation[$product]['SimilarityTotal'] = 0;
                }
                $calculation[$product]['Total'] += $similarityScore *
                $rating;
                $calculation[$product]['SimilarityTotal'] +=
                $similarityScore;
            } } }
    $recommendations = [];
    foreach ($calculation as $product => $values) {
        $recommendations[$product] = $calculation[$product]['Total']
    }
}
```

```

$calculation[$product]['SimilarityTotal']; }
arsort($recommendations);
return $recommendations; }

function pearsonScore(array $reviews, string $person1, string $person2): float {
    $commonItems = array();
    foreach ($reviews[$person1] as $product1 => $rating) {
        foreach ($reviews[$person2] as $product2 => $rating) {
            if ($product1 == $product2) {
                $commonItems[$product1] = 1;
            } } }
    $n = count($commonItems);
    if ($n == 0)
        return 0.0;
    $sum1 = 0;
    $sum2 = 0;
    $sqrSum1 = 0;
    $sqrSum2 = 0;
    $pSum = 0;
    foreach ($commonItems as $product => $common) {
        $sum1 += $reviews[$person1][$product];
        $sum2 += $reviews[$person2][$product];
        $sqrSum1 += $reviews[$person1][$product] ** 2;
        $sqrSum2 += $reviews[$person2][$product] ** 2;
        $pSum += $reviews[$person1][$product] *
            $reviews[$person2][$product];
    }
    $num = $pSum - (($sum1 * $sum2) / $n);
    $den = sqrt(($sqrSum1 - (($sum1 ** 2) / $n)) * ($sqrSum2 - (($sum2 ** 2) / $n)));
    if ($den == 0) {
        $pearsonCorrelation = 0;
    } else {
        $pearsonCorrelation = $num / $den;
    }
    return (float) $pearsonCorrelation;
}

```

## **CHAPTER 4**

### **IMPLEMENTATION AND TESTING**

Among the different phase of software development life cycle (SDLC), one of the major step is system implementation and testing. At this phase, system is develop according to the UI/UX design using require programming language and different testing system is performed for disclosing of the bug and debugging it. After the system is in bug-free condition and ready for installation, it will be deployment for production as per user requirement.

In this phase, the step like coding, testing, installation, training and documentation are followed:

#### **4.1 Implementation**

For the implementation part to convert the UI design to the real world software through coding, the developers team has used different open-source platforms of front-end and backend along with free database tools.

##### **4.1.1 Tool Used**

Case Tool:

As a part of case tool, different software like draw.io for data modelling and database schema, ludichart for process modelling has been used for design purpose

Front-End Language:

HTML: HTML is use for designing the interface and structure of the system

CSS: CSS is used for styling out the interfae through different css properties

JavaScript: JavaScript is used for adding the behaviour in our system and for the client side for validation

Backend Language:

PHP: For the backend part, open source programming i.e. PHP is used to create dynamic web application and to interact with database

Database Platform:

MySQL: As a database platform, My Struture Query Language is use as an open source SQL database management system to process and retrieve queries from the database

#### 4.1.2 Implementation Details of Module

A module is a software component or part of a program that contains one or more routines. One or more independently developed modules make up a program. The application name as e-commerce portal is divided into different modules.

**Registration Module:** The registration module is responsible for creating the new customers/users for this system. Here in this module, new users have to enter full name, username, password, contact details, address and city in order to register as a active customer to access this system.

**Login Module:** This module is responsible for the admin and users to log in to our system for accessing their respective portal. Here, in the admin login, the admin have to enter the admin email and password which has been pre-define in the database and users have to enter the username and password which was set during account registration process.rd

**Dashboard Module:** This module is responsible for accessing the dashboard section. Admin are only capable to access the dashboard consist of total count of fetch data in product, category, sub-category, brands, order and and users details.

**Category Module:** This module is important to manage the category details of different product.In this module, admin are only authorize to maintain the details and to view the category.The category are added into software so that the product can be include into the different category.

**Sub-Category Module:** Same as category module, this module is responsible for managing and viewing the sub-category details. Here, the sub-category details are add under the specific category added before in category module.

**Product Module:** This module is responsible for accessing and managing the product section. From here, admin can manage the product along with the product image and users are proficient to view and search the product as well as add to cart and shop it.

**Wishlist Module:** The wishlist module is important for the users to add the product they wish item into wishlist section. In this module, the details like product image, product name, product price of wish product are fetched and shown. From this module, users are capable to proceed to cart.

**Add-to-Cart Module:** This module is responsible for the user to provide access to add the product into the cart section. In this add-to-cart module, product image, product name, product price, quantity, total amount are displayed. Through this module, user can redirect to continue shopping for further selection of product or proceed to checkout for payment.

**Order Module:** This module is responsible to show all the order details of customer. Both customer and admin can view the order summary. Admin can monitor order of all the customer whereas customer can only view the order done by themselves or the account holder order.

**Payment Module:** Here, from this module users can pay the total amount after inserting card number and shipping address details. All the details like bill in the name of, total no of item, product title and total amount are passed from the add-to-cart module whereas the credential payment details are needed to confirm and success of product order.

**Modify Detail Module:** This modify detail module is responsible to change the details of customers used while account registration. In this module, the new details of customers will replace the existing data listed in database.

**Change Password Module:** This module is responsible to change the password of admin and customer with the new ones at the time they desire.

## 4.2 Testing

The developer team of 'e-commerce portal' perfectly tested this system functionality using dummy data. This system is entirely tested so that the few user of this system can have a trial phase. The system has been tested throughly using the following testing technique:

### 4.2.1 Test Case Requirement

For the verification, validation and debugging of the system, the following test case has been designed:

**Table 4.1: Test Case Requirement of E-Commerce Portal**

S.N.	Description	Requirement
1.	Right of Admin	Create Category details and manage it
		Set sub-category and maintain it
		Adding on and managing of different brand list
		Inserting of product information and handle it
		View all the order placed by customers
		View all the users details
2.	Rights of Customer	Register for accessing the e-commerce portal
		Checkout all the product available of different brand
		Outlook the popular, latest and recommendation category product
		Proceed payment through e-commerce payment gateway
		Modify the detail used while account registration
		Get recommendation on the basis of review provided

3.	Right of Visitor	View all the product available for purchasing without login into the system
4.	Duplication of username and mobile number	Customer must use unique username and mobile number rather than existing one from our system while creating account
5.	Change Password	Admin and user must be able to change password of their one

#### 4.2.2 Test Cases for Unit Testing

During the testing process, individual units of source codes, sets of one or more program modules are tested to determine whether they can perform as per expectation, Each separate activities like registration, log in, add new product etc. have been tested individually and all the tested activities pass with the successful result.

**Table 4.2: Test Case for admin login**

S. No.	Test Case Id	Test Description	Input Test Data	Expected Result	Actual Result	Pass/Fail
1.	TC-01.1	Open browser and enter url	localhost/ecommerce/admin	The url should be redirected to the login page and login page for admin should be displayed with the input field of username and password	Login Page shown with the username and password of admin for accessing the admin portal	Pass
2	TC-01.2	Enter valid data in	Username: <b>admin</b>	Redirecting to the admin portal	Admin Portal Displayed	Pass

		username and password field	Password: *****			
3	TC-01.3	Enter data in username and password as empty field	Username:  Password:	Error message must be shown as: Please fill all the fields	Error message displayed as please fill all the fields	Pass
4.	TC-01.4	Enter valid data in username and leave password as empty field	Username: <b>admin</b>  Password:	Error message must be shown as: Please fill password fields	Error message displayed as please fill password fields	Pass
5.	TC-01.5	Enter valid data in username as blank and password as some input value	Username:  Password: *****	Error message must be shown as: Please fill username fields	Error message displayed as please fill username field	Pass
6.	TC-01.6`	Enter invalid username and password	Username: <b>nananana</b>  Password: *****	Error stating username and password not matched as a displayed warn	Username and Password not matched is displayed	Pass



**Table 4.3: Test Case for Add New Product**

S. No.	Test Case Id	Test Description	Input Test Data	Expected Result	Actual Result	Pass /Fail
1	TC-02.1	Enter valid data in product title, product category, product sub-category, product brand, product description, featured image, product price, available quantity and status	Product Title: Gorkha Ice Beer Product Category: Nepali Beer Product Sub- Category: Beer Product Brand: Gorkha Product Description: Gorkha Ice Beer Featured Image: beering.jpg Product Price: 650 Available quantity: 10 Status: Active	Success message stating as: Product added successfully	Message with Product added successfully was displayed	Pass
2.	TC-02.2	Leave product title as blank and enter valid data in product category, product sub-category, product brand, product description, featured	Product Title: [empty] Product Category: Nepali Vodka Product Sub- Category: Vodka Product Brand: Russlan Product Description: Ruslan Vodka Featured Image: vodkaimg.jpg	Error message must be shown as: Title Field is empty	Error message displayed as Title Field is empty	Pass

		image, product price, available quantity and status	Product Price: 650 Available quantity: 10 Status: Active			
3.	TC-02.3	Enter valid data in product title, product description, featured image, product price, available quantity and status but leave the product category as disable option value	Product Title: Gorkha Ice Beer Product Category: Select Category Product Sub- Category: [empty] Product Brand: [empty] Product Description: Gorkha Ice Beer Featured Image: beering.jpg Product Price: 650 Available quantity: 10 Status: Active	Product Sub-Category and Product Brand must be display with the option value of First select category and First select-sub category respectively and error message of Category Field is empty	Error message is shown as Category Field is empty and field of sub-category and brands are provided with only disable option value but not with other sub-category and brand value	Pass
4.	TC-02.4	Enter valid data in all field except the feature image with wrong file format	Product Title: PlumTea Product Category: Tea Product Sub- Category: Cold Tea Product Brand: Oak Product Description: Plum Tea for you Featured Image: beering.svg	Error messag must be displayed with:Feature Image is invalid	Error message as Feature Image is invalid is displayed	Pass

			Product Price: 90 Available quantity: 18 Status: Active			
5.	TC-02.5	Enter blank/empty data in all the field	Product Title: Product Category: Product Sub- Category: Product Brand: Product Description: Featured Image: Product Price: Available quantity: Status:	Error message must be shown as: Title field is empty	Message of error is display as Title field is empty	Pass

**Table 4.4: Test Case for Customer Registration**

S. No.	Test Case Id	Test Description	Input Test Data	Expected Result	Actual Result	Pass /Fail
1	TC-03.1	Open browser and enter url	localhost/ecommerce/register.php	Registration form with the input field of firstname, lastname, username, password, mobile, address and city should be displayed	Registration form shown with the firstname, lastname, username, password, mobile, address and city for creating account	Pass

2	TC-03.2	Enter valid data in all the input field	Firstname : Aavash Lastname: Ganesh Username: aavashhh Password: ***** Mobile: 9843803568 Address: kamalbinayak City: bhaktapur	Message must be displayed as: Account Create Successfully	Success message display as account create successfully	Pass
3	TC-03.3	Enter valid data in all the field except the username as duplicate value	Firstname : Srijana Lastname: Karki Username: aavashhh Password: ***** Mobile: 9841919993 Address: santinagar City: kathmandu	Error message must be shown stating as: Username already exists	Error message display as username already exists	Pass
4.	TC-03.4	Enter valid data in all the field except the mobile field as duplicate value	Firstname : Bipasha Lastname: Pradhan Username:imbipasha Password: ***** Mobile: 9841919993 Address: hattigaun City: pokhara	Error message must be display as: Mobile already exists	Error message showing as mobile already exists is displayed	Pass
5.	TC-03.5	Enter blank/empty data in all the field	Firstname : Lastname: Username: Password: Mobile: Address: City:	Error message must be display as: Please fill all the fields	Error message displayed as please fill all the fields	Pass

#### 4.2.3 Test Case for System Testing

The system testing have been performed by testing the entire software within the developer resources. From this system, we can concluded the entire e-commerce portal runs smoothly and show the working functionality as per expected.

**Table 4.5: Black Box System Testing of E-Commerce Portal**

S.No.	Description	Requirements	Results	Test Status
1	Right of Admin	Login to the system	Admin can log in to the system using admin credentials	Passed
		Access the dashboard	Admin can view the total count of category, sub-category, product, brands, order and user listed in system	Passed
		Managing and adding category	Admin can add and manage category details for product	Passed
		Add on and handling sub-category data	Admin can also handle as well as add sub-category data	Passed
		Inserting and administering different brand	Admin can insert and administer different brand for product	Passed
		Setting up and managing product	Admin can set up and manage product to be view by customers	Passed
		View order details	Admin can view all the order placed by customer	Passed

		Outlook customer details	Admin can outlook details of customer use while creating account	Passed
2.	Right of Customer	Register for new account	Customer can register for new account	Passed
		Log In to the customer portal	Customer can login into their respective customer portal	Passed
		View product under different sub-category	Customer can view product of different sub-category	Passed
		Outlook popular, latest and recommend product	Customer can view the popular, latest and recommend product	Passed
		Add and remove the product into wishlist bucket	Customer can add the product into the wishlist bucket as well as remove it	Passed
		Add the product into cart section	Customer can add the product into the cart section for checkout	Passed
		Checkout product for payment	Customer can checkout and pay the product price through payment gateway	Passed
		Review and get recommend of different product	Customer can review the product after login the system and get automatic recommend on the basis of review	Passed

			provide/ taste match	
		View order details	Customer can view all the order details they purchase	Passed
		Modify customer details	Customer can modify the details they use while account creation	Passed
3.	Right of Visitor	View product under different sub-category and of popular and latest section	Visitor can only view the product of different sub-category and product of popular and latest section	Passed
4.	Duplication of username and mobile details	Customer should provide unique username and mobile number while creating account	Once used username and mobile details for account registration cannot further be used for new account creation	Passed
5.	Change Password	Admin and Customer should be able to change password	Admin and Customer can only change password if they are login into their respective portal	Passed

## **CHAPTER 5**

### **CONCLUSION**

#### **5.1 Lesson Learnt/ Outcome:**

From the developer view, the major lesson learnt was the process in developing the real world software. Similarly, the need of clean and well-structure code for debugging the error is also well understood. Likewise, the importance of variable declaration and the maintaining the database in effective manner is also learnt through this software. Moreover, through this project the skill and idea for problem solving and writing documentation was also acquired.

Moving towards the outcome, this system was developed with the objectives to fulfill the requirement of the customer to order the product related to different brand and category of liquors and the outcomes came as per the expectations. The outcomes of this project is the real world software name as e-commerce portal where the admin can add and manage the product data and the customer can view, order the product under different brands, category and sub-category using add-to-cart feature and pay through online using payment gateway. Customer can review the product as per their satisfaction and the system recommend the product as per the customer taste match. Similarly, admin can view all the order details placed by customer along with the customer details.

#### **5.2 Conclusion**

‘E-Commerce Portal’ is a web-based application in which viewing and ordering of different liquors product as well as paying it using online mode feature are provided to the customer of this system. Similarly, it also provides the brief details about the product and recommendation section under the basis of taste match/review of customer. This system is developed targeting the customer who are searching the liquors product of different national and international brand and get delivered at their doorstep. Along with the different features provided, this system is cost-effective so it can be used by most of the customers existing inside Kathmandu valley with free of cost at any desired time. The low market price of the



product and different service provide comparing to other e-commerce and physical store helps the customer in different aspect while using this system.

Going through the development process of this project, we have been familiarized with the practical knowledge of how web application are designed and developed mainly the ecommerce site. By the time of accomplishment of this project, we get to realize the true essence of time management and problem solving technique and we have been built up with the confidence regarding system analysis, designing, implementation, debugging, testing and maintenance.

### **5.3 Future Enhancement**

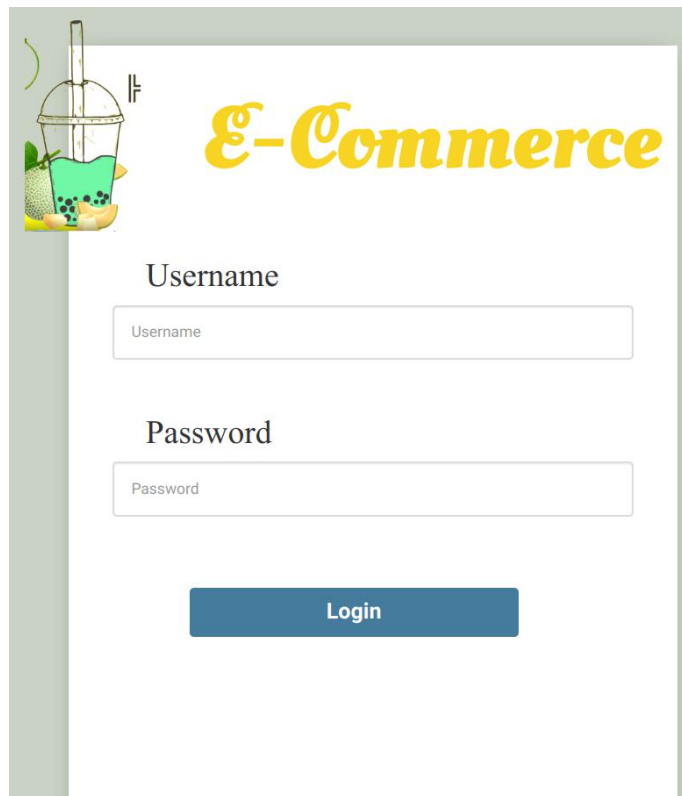
This e-commerce portal can be further enhance to upgrade its features and functionality. Different national and international payment gateway like e-sewa, ime pay, paypal, upi pay etc. can be integrated into this system for receiving payment of product from customer. Tracking of order by customer and automatic invoice generation can also be done after the customer purchase the product. Likewise, another system enhancement can be of converting the single-vendor into the multi-vendor site in near future. Moreover, voucher and debit card discount for different product can also be implement for the benefit of customer. Similarly, not only the liquors item but also other section of product like fashion, automobile etc. can be listed for purchasing through this system.

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## APPENDICES

Login Interface for admin



The login interface features a header with a smoothie cup icon and the 'E-Commerce' logo. Below the header, there are two input fields labeled 'Username' and 'Password'. A blue 'Login' button is positioned at the bottom of the form.

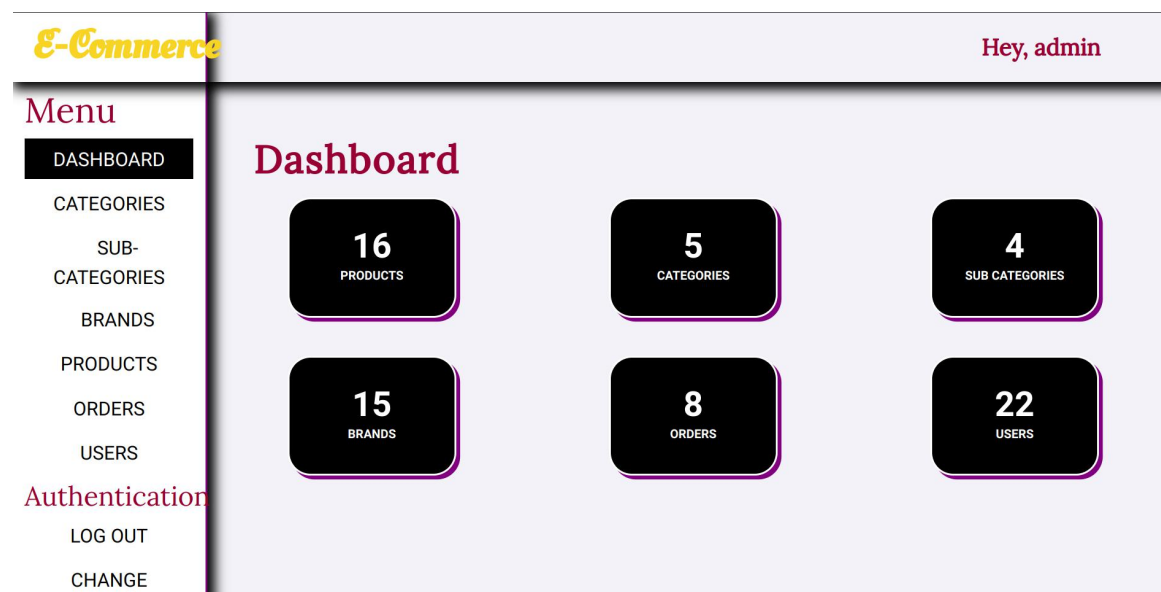
**E-Commerce**

Username

Password

Login

Dashboard for admin portal



The dashboard includes a top header with the 'E-Commerce' logo and the user's name 'Hey, admin'. A left sidebar contains a 'Menu' with options: DASHBOARD, CATEGORIES, SUB-CATEGORIES, BRANDS, PRODUCTS, ORDERS, and USERS. Below the menu is an 'Authentication' section with 'LOG OUT' and 'CHANGE' links. The main content area, titled 'Dashboard', displays six statistics in a 2x3 grid: 16 PRODUCTS, 5 CATEGORIES, 4 SUB CATEGORIES, 15 BRANDS, 8 ORDERS, and 22 USERS.

**E-Commerce** Hey, admin

**Menu**

- DASHBOARD
- CATEGORIES
- SUB-CATEGORIES
- BRANDS
- PRODUCTS
- ORDERS
- USERS

**Authentication**

- LOG OUT
- CHANGE

**Dashboard**

16 PRODUCTS	5 CATEGORIES	4 SUB CATEGORIES
15 BRANDS	8 ORDERS	22 USERS

## Category Interface

E-Commerce

Hey, admin

Menu

DASHBOARD

CATEGORIES

SUB-CATEGORIES

BRANDS

PRODUCTS

ORDERS

USERS

Authentication

LOG OUT

CHANGE

All Categories

Add New

Title	Action
Cold Coffee	<a href="#">Edit</a> <a href="#">Delete</a>
Tea	<a href="#">Edit</a> <a href="#">Delete</a>
Juices	<a href="#">Edit</a> <a href="#">Delete</a>
Non-Alcoholic	<a href="#">Edit</a> <a href="#">Delete</a>
Alcoholic	<a href="#">Edit</a> <a href="#">Delete</a>

E-Commerce

Hey, admin

Menu

DASHBOARD

CATEGORIES

SUB-CATEGORIES

BRANDS

PRODUCTS

ORDERS

USERS

Authentication

LOG OUT

CHANGE

Add New Category

Category Name

Category Name

Submit

## Product Interface

E-Commerce

Hey, admin

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All Products

Add New

#	Title	Category	Brand	Price	Quantity	Image	Status	Action
PDR0043	Creamy Choco Hazelnut	Boba Tea	Yo Boba	120	300		Active	<a href="#">Edit</a> <a href="#">Delete</a>
PDR0042	Pink Guava Slava	Boba Tea	Yo Boba	180	80		Active	<a href="#">Edit</a> <a href="#">Delete</a>
PDR0041	Rich and Sweet Brown Sugar Boba	Boba Tea	Yo Boba	150	20		Active	<a href="#">Edit</a> <a href="#">Delete</a>
PDR0040	Royal Musk Sweet Red	Wine	Royal Musk	2000	89		Active	<a href="#">Edit</a> <a href="#">Delete</a>

E-Commerce

Hey, admin

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LOG OUT

CHANGE

Add New Product

Product Title

Product Title

Product Category

Product Sub-Category

Product Brand

Product Description

Featured Image

Product Price

Available Quantity

Status

Submit

## Order Interface

All Orders		
ORDER No.	Customer Details	Action
ODR0054	Aavash	<a href="#">View</a>
ODR0053	Aavash	<a href="#">View</a>
ODR0055	Ranju	<a href="#">View</a>

ORDER DETAILS OF Aavash						
ORDER No.	Product Title	Product QTY.	Total Amount	Order Date	Debit Number	Delivery Address
ODR0054	SanMiguel 700ml Beer	2,	900	August 20	79733993	Kathmandu
ODR0053	nepal	3,	234	today	780000	bhaktapur

## User Interface

All Users			
Full Name	Username	Mobile	City
Aavash Ganesh	heyaavash	12345678	Bhaktapur
Bipasha Shrestha	imbipasha	2222222	bkt

## Customer Interface

| Think Before Drink | Coffee Black , Water Tap Whiskey Neat | Save Water Drink Beer

ECommerce

Search for...

Search

BEER

WHISKEY

BOBA TEA

WINE

PRODUCED IN NEPAL

Khukri

SPICED RUM

THE ORIGINAL HIMALAYAN RUM INFUSED WITH NEPALESE SPICES

42% ALC. 84PROOF

SINCE 1959

Khukri

SPICED RUM

PREMIUM SPICED RUM

INFUSED WITH NEPALESE SPICES

## Popular Products



Ventisque Syrah...  
9000



San Miguel 700ml Beer...  
450



Pink Guava Slava...  
180



Creamy Choco Hazelnut...  
120



Gurkha Premium 1 Litre...  
2850

## Latest Products



Registration interface for customer

### CREATE YOUR ACCOUNT

First Name

Last Name

Username

Password

Mobile

Address

City

Sign Up

Login Interface for customer

## LOGIN HERE

Username

Password



Login

Don't Have an Account

[Register](#)

## Add-to-cart interface

### My Cart

Product Image	Product Name	Product Price	Quantity	Sub Total	Action
	Ventisque Syraha	Rs.9000	<input type="text" value="1"/>	Rs. 9000	
TOTAL AMOUNT (Rs)					9000

Continue Shopping

Proceed to Checkout

## Payment Gateway Interface

### Proceed To Pay

#### Madira.np Pay

Bill in the name of:	Aavash
Total No of Item:	1,
Product title:	Ventisque Syraha
Shipping Amount	Rs. 70
Total Amount:	Rs.9070

Enter Credential

Card Number:

Shipping Address:

Pay now!