



جامعة محمد الأول بوجدة  
UNIVERSITE MOHAMMED PREMIER OUJDA  
ⵜⴰⵎⴰⵔⵜ ⴰⵎⴰⵏⴰⵢⵜ ⴰⵏ ⵙⴰⵎⴰⵏ ⴰⵙⴰⵎⴰⵏ ⴰⵏ ⵙⴰⵎⴰⵏ

University Mohammed First  
Multidisciplinary Faculty  
Computer Science department



الكلية متعددة التخصصات النادر  
Faculté Pluridisciplinaire de Nador  
ⵜⴰⵎⴰⵔⵜ ⴰⵎⴰⵏⴰⵢⵜ ⴰⵏ ⵙⴰⵎⴰⵏ ⴰⵓⵎⴰⵏ ⴰⵏ ⵙⴰⵎⴰⵏ

◊ Nador–Morocco ◊

**End of Studies' Project**

To obtain the degree of

**License fundamental studies**

In Mathematics and computer Science

Option: Administration of Web Technologies

**By:**

**Oussama Elmaimouni**

---

**Dynamic e-commerce Website with Recommendation System**

---

Sustained publicly on July 30, 2022, in front of the jury:

Prof. Mostapha Bedri      FPN, University Mohammed First, Nador      Supervisor

Prof. Khalid El Makkaoui      FPN, University Mohammed First, Nador      Examiner

**Academic year: 2021–2022**

***We dedicate this humble work to***

*Our parents*

*Our family*

*Our supervisors*

*Our professors*

*Our friends and classmates.*

---

# Abstract

Recently, e-commerce platform is playing an important role in some areas; its activities are a subset of e-business activities.

So in this project we build and develop a reliable website using many existing web technologies, this website will be an online shop of our professor's workshop based on e-commerce theories, integrated with a recommendation system which is one of the major sources for generating revenue in different online companies.

Recommendation not only increases the sales of product but it helps to make the system personalized and helps to find out the preferences and interest of particular user to the product.

We tried to make it easy-to-use from the registration step to the payment, all this was based on a well-studied plan.

**Keywords:** PHP, MySQL, Html, CSS, Java Script , Bootstrap , SQL Dynamic website , JQuery , PhpMyAdmin .

# Resume

The aim of this thesis is to build an E-commerce website for real electronic store called “Electro.”.

Website plays a major role in growth and development of any business. It is the most effective way to reach wide number of audiences in short time. Website makes it easy for the businesses to analyze about user’s persona.

This thesis focuses mainly on two things, first being the front-end development and second back-end development.

The front-end side can sometimes also be refereed as the client side which gives user a visible user interface and we use more than one technologies in this side like HTML, CSS, JS, BOOTSTRAP and JQUERY.

Back end development can also be termed as behind the scene of functionality of a website. It helps users to communicate with the servers through web browsers. PHP programming language is used for making the website accessible in server side and MYSQL used for managing our database for the web-site.

System realizes the basic function of the site, including customer registered login, visit the site information, information query, shopping and fill in the order.

**Keywords:** PHP, MySQL, Html, CSS, Java Script, Bootstrap, SQL Dynamic website, JQuery, PhpMyAdmin.

---

# Contents

<b>List of Figures</b>	<b>7</b>
<b>List of Abbreviations</b>	<b>9</b>
<b>General Introduction</b>	<b>10</b>
<b>1 Specification and conceptual study</b>	<b>11</b>
1.1 Introduction	11
1.2 Needs to Create a Website	11
1.3 The Solutions Proposed	11
1.4 Conceptual Study	12
1.4.1 Requirements Gathered	12
1.4.2 Why we choose UML and not Merise	13
1.4.3 UML (Unified Modeling Language)	13
1.4.4 Project Futures	14
1.4.5 Use Case Diagram	14
1.4.6 Class Diagram	15
1.4.7 Sequence Diagram	16
1.4.8 Transition Diagram	17
1.4.9 Activity Diagram	17
1.4.10 Entity Relational Diagram	19
1.4.11 Relational Model	20
1.5 Recommendation system	21
1.5.1 What's the recommendation system?	21
1.5.2 Why recommendation system?	21
1.5.3 Recommendation system in Ecommerce Industry	21
1.5.4 How recommendation system works?	21
1.5.5 Types of recommendation system	22
1.5.6 Content-Based filtering	22
1.5.7 Collaborative filtering (is the type we used in our website)	23
1.5.8 What's the cold start problem and how to fix it?	27
1.6 Conclusion	27
<b>2 Functional Needs</b>	<b>28</b>
2.1 Introduction	28

2.2	E-commerce Architecture .....	28
2.2.1	What is the importance of a good website structure? .....	28
2.2.2	Types of E-commerce Architecture .....	29
2.2.3	Mechanism for Transporting Information on the Internet .....	31
2.3	Programming Language.....	32
2.3.1	HTML .....	32
2.3.2	CSS .....	33
2.3.3	JavaScript.....	33
2.3.4	SQL .....	34
2.3.5	JQuery .....	35
2.3.6	Bootstrap .....	35
2.3.7	PHP .....	36
2.4	API.....	37
2.5	Development Tools.....	37
2.5.1	XAMP .....	37
2.5.2	Apache .....	38
2.5.3	MySQL and PhpMyAdmin .....	39
2.5.4	VsCode .....	39
2.6	Conclusion.....	40
<b>3</b>	<b>Website Application</b>	<b>41</b>
3.1	Introduction .....	41
3.2	Admin View .....	41
3.2.1	Admin login .....	41
3.2.2	Admin Page .....	42
3.3	User View .....	45
3.3.1	User login .....	45
3.3.2	User Registre .....	46
3.3.3	Home page .....	47
3.3.4	Product page .....	50
3.3.5	Shopping Cart Page .....	52
3.3.6	Check order page .....	53
3.4	Conclusion .....	55
	<b>Conclusion and future directions</b>	<b>56</b>
	<b>References</b>	<b>59</b>

---

# List of Figures

0	statistics of the ecommerce market .....	10
1.1	Use Case Diagram .....	14
1.2	Class Diagram .....	15
1.3	Transition state Diagram .....	16
1.4	Sequence Diagram .....	17
1.5	Activity Diagram for admin .....	18
1.6	Activity Diagram for user .....	19
1.7	Entity relational diagram .....	20
1.8	Relational model .....	20
1.9	Different type of recommendation system .....	22
2.1	E-commerce architecture diagrams .....	29
2.2	Two-tier architecture .....	30
2.3	Three-tier architecture .....	31
2.4	Transporting information on internet .....	32
2.5	HTML .....	32
2.6	CSS .....	33
2.7	JS .....	33
2.8	SQL .....	34
2.9	JQuery .....	35
2.10	Bootstrap .....	35
2.11	PHP .....	36
2.12	PayPal Rest API .....	37
2.13	XAMP .....	38
2.14	Apache .....	38
2.15	PhpMyAdmin .....	39
2.16	VsCode .....	39
3.1	Admin login Interface .....	41
3.2	Admin page Interface 1 .....	42
3.3	Admin page Interface 2 .....	42
3.4	Add new product Interface .....	43
3.5	Update product Interface .....	43
3.6	Users Registered Interface .....	44

3.7	Users Reviews Interface	44
3.8	Products Interface	45
3.9	Orders Interface	45
3.10	User login Interface	46
3.11	User Register Interface	46
3.12	Navbar Interface	47
3.13	Category carts Interface	47
3.14	New Product Interface	48
3.15	Product discount Interface	48
3.16	Recommended Product Interface	49
3.17	Best-selling Product Interface	49
3.18	Footer Interface	50
3.19	Product Detail Interface	51
3.20	Reviews Interface	51
3.21	Product related Interface	52
3.22	Shopping cart Interface	53
3.23	My order Page	53
3.24	PayPal Page	54
3.25	Command page	55



---

# List of Abbreviations

**API:** application program interface

**CSS:** Cascading Style Sheets

**FPN:** Faculté Pluridisciplinaire de Nador

**JS:** JavaScript

**HTML:** Hyper Text markup Language

**HTTP:** HyperText Transfer Protocol

**MySQL:** Michael Widenius '&' Structured Query Language

**PHP:** Hypertext Preprocessor

**PMA:** PhpMyAdmin

**SQL:** Structured Query Language

# General Introduction

Nowadays, the commerce has took the online path, we find that the majority of companies even the individualizes trying to buy and sell their products online.

These products could be material (shoes, clothes, electronics devices, utensils...), or immaterial like (movies, services, courses...) that's why the E-Commerce Sales Are Predicted to Hit \$6.5 Trillion by 2023 while it was \$4.9 in 2021 (ref :Statista)

## Retail e-commerce sales worldwide from 2014 to 2023 (in billion U.S. dollars)

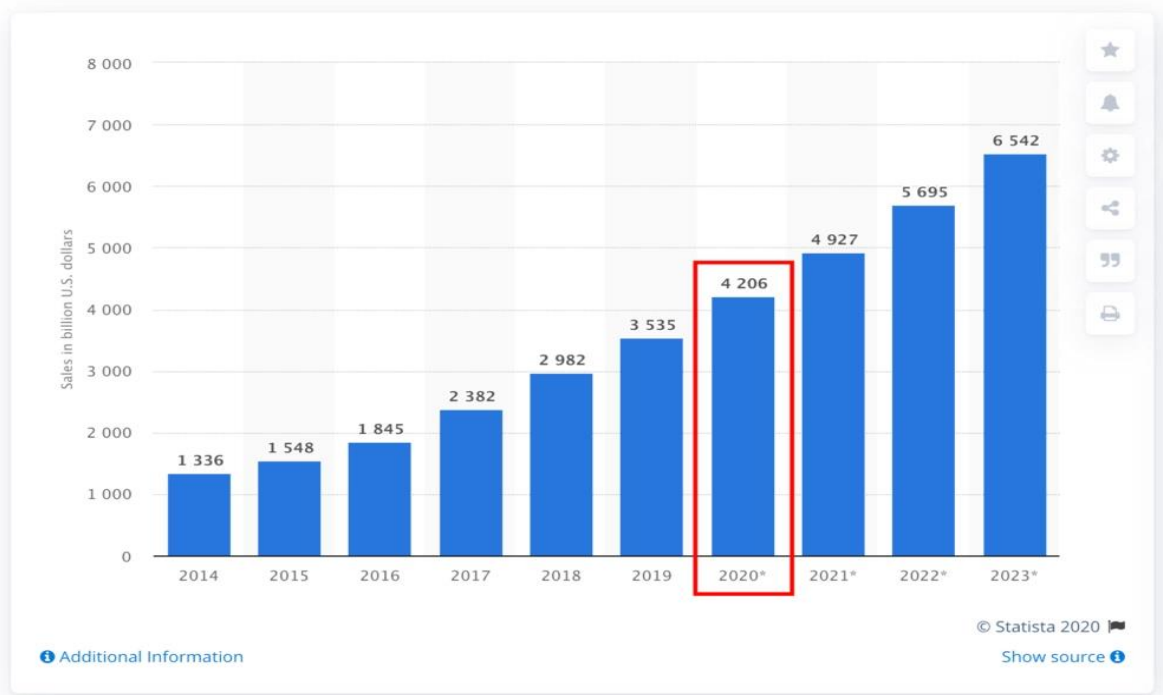


Figure 0- statistics of the ecommerce market

As same as the global ecommerce industry, the e-commerce industry in Morocco has grown steadily in recent years. The number of e-commerce users in the country amounted to 14.7 million in 2022, rising from 6.4 million in 2017. Within the same period, the e-commerce penetration rate also increased considerably. Online shoppers accounted for around 40 percent of Morocco's population in 2022. The increasing internet penetration, mobile device adoption, and the growing number of online marketplaces have driven the growth of the country's e-commerce market.

---

## **1- Specification and conceptual study**

### **1.1 Introduction**

Database is what all software developers are concerned with in the first place. If you have a well-designed database, you can be sure that the entire development process will go as smoothly. For the purpose of designing the best database, tools And frameworks like Merise and UML can be used for data Modeling.

### **1.2 Needs to Create a Website**

Creating an e-commerce website is not a complicated endeavor. You can focus on developing solid products and promoting your brand while turning to a software company to handle the technical details—and you won't even need an engineering degree. However, while you don't need to be a programmer yourself, it's important that you understand at least the basics of what your website hosting provider delivers in terms of e-commerce capabilities, and that issue remains important even after you get your e-commerce operation up and running.

### **1.3 The Solutions Proposed**

First and foremost, your vendor will help you determine the look and feel of your website. It will also provide the capacity to store all of your data, and help you finalize and fulfill transactions. Those are just the most obvious obligations of an e-commerce provider. Beyond that, there's a lot you should know about the specific tech your partner is using to ensure your website is functional, successful, and secure.

## **1.4 Conceptual Study**

### **1.4.1 Requirement gathered**

In our website we'll have two types of users, the first type is the customer who's can be either a new one or a registered one that already have an account made up with a unique id for identifying him among other users, a username, an email address, a password, phone number and his Address,

So he just have to login every time he want to access to our website or logging out in case that's already logged. In the other hand the new user can browse and check products and see the popular or the most sold products in our website but he can't make any purchase until he register.

Customer, either by searching or by the help of a recommendation system which will suggests products for him based on his similarity with other users. he can check and then order one product or more in a given date, each product belongs to a given category, and have as well an unique number , a name , a picture , a price and a text that describe his properties , each order have an unique id and a price that's made up of all ordered products prices.

And because the costumer opinion is important for us we handle his rates for our products and give him the privileges to show us his thoughts about our products by writing commentaries. And finally the second type of our website user is made for the administration purpose called the super user or the admin who have a few information for logging into the admin space and manage the website's components, such adding, deleting and updating products or checking customer's reviews, orders.

---

### **1.4.2 Why We Prefer UML for Merise.**

Merise, is not as widely used. It also has a set of advantages and several disadvantages. Merise does a great job with the modeling and the conception of small databases. But, when designing large databases, it may not be the best methodology to opt for. Also, it is limited to the 3<sup>rd</sup> normal form. In addition to that, it is best suited to work with modeling sequential tasks and does not deliver a good result when dealing with distributed ones. It is not meant to model semantic data.

While UML is most often used for software engineering but has extended its use to business processes and other project workflows. Essentially, UML is visualizing software through diagrams, specifically one of the thirteen UML diagrams. This modeling language was created by three software engineers at the company Rational Software for their projects, and it has become the standard with very few updates over the years.

### **1.4.3 UML (Unified Modeling Language).**

The Unified Modeling Language (UML) was created to forge a common, semantically and syntactically rich visual modeling language for the architecture, design, and implementation of complex software systems both structurally and behaviorally. UML has applications beyond software development, such as process flow in manufacturing.

It is analogous to the blueprints used in other fields, and consists of different types of diagrams. In the aggregate, UML diagrams describe the boundary, structure, and the behavior of the system and the objects within it.

### 1.4.4 Project features

- User Login
- User Register
- Admin login
- Account Validation
- Manage Customers' Information
- Monitor Orders , Users and Products
- Manage Products' Information
- Manage Payments and Deliveries
- Manage Users Reviews
- Products Recommendations

### 1.4.5 Use Case Diagram

The figure below gives us the global use case of the website concerned with all the actors in the system.

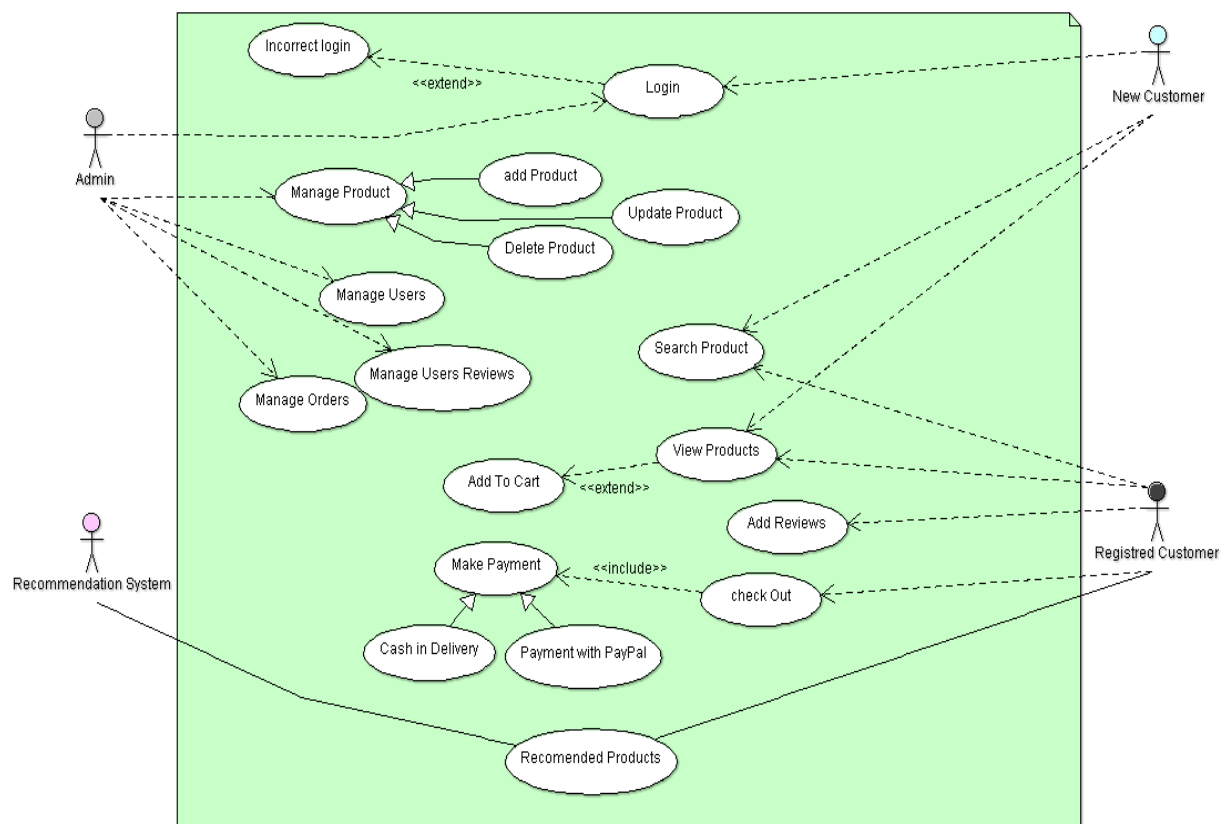


Figure 1.1: Use Case Diagram

This figure represents the use case diagram. It is a global idea about all the actions done on the website.

### 1.4.6 Class Diagram

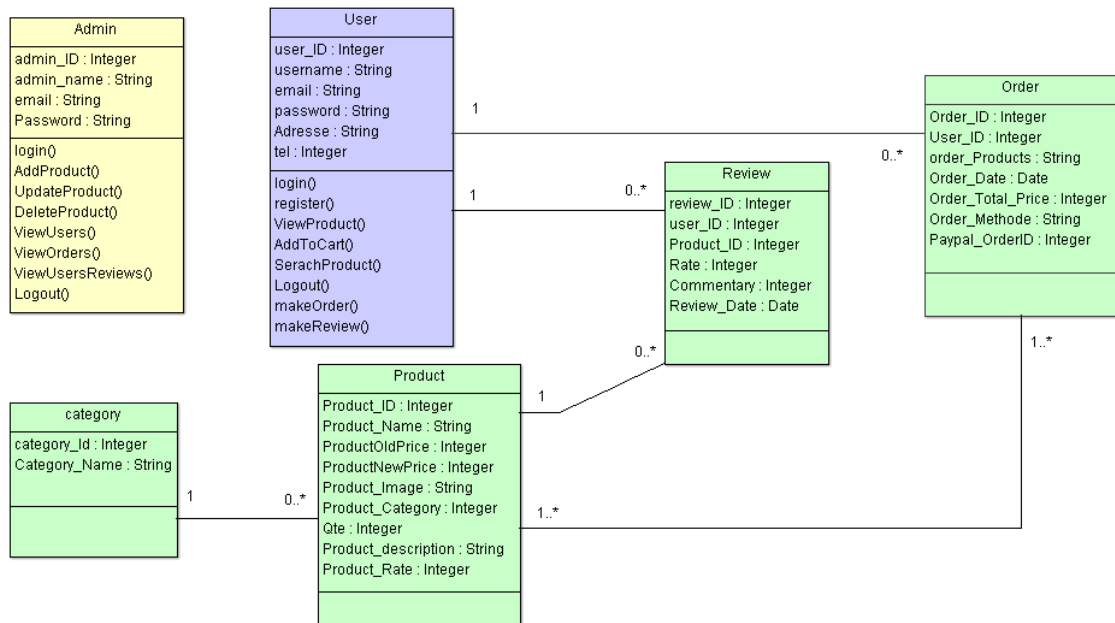


Figure 1.2: Class Diagram

1.4.7 Sequence Diagram

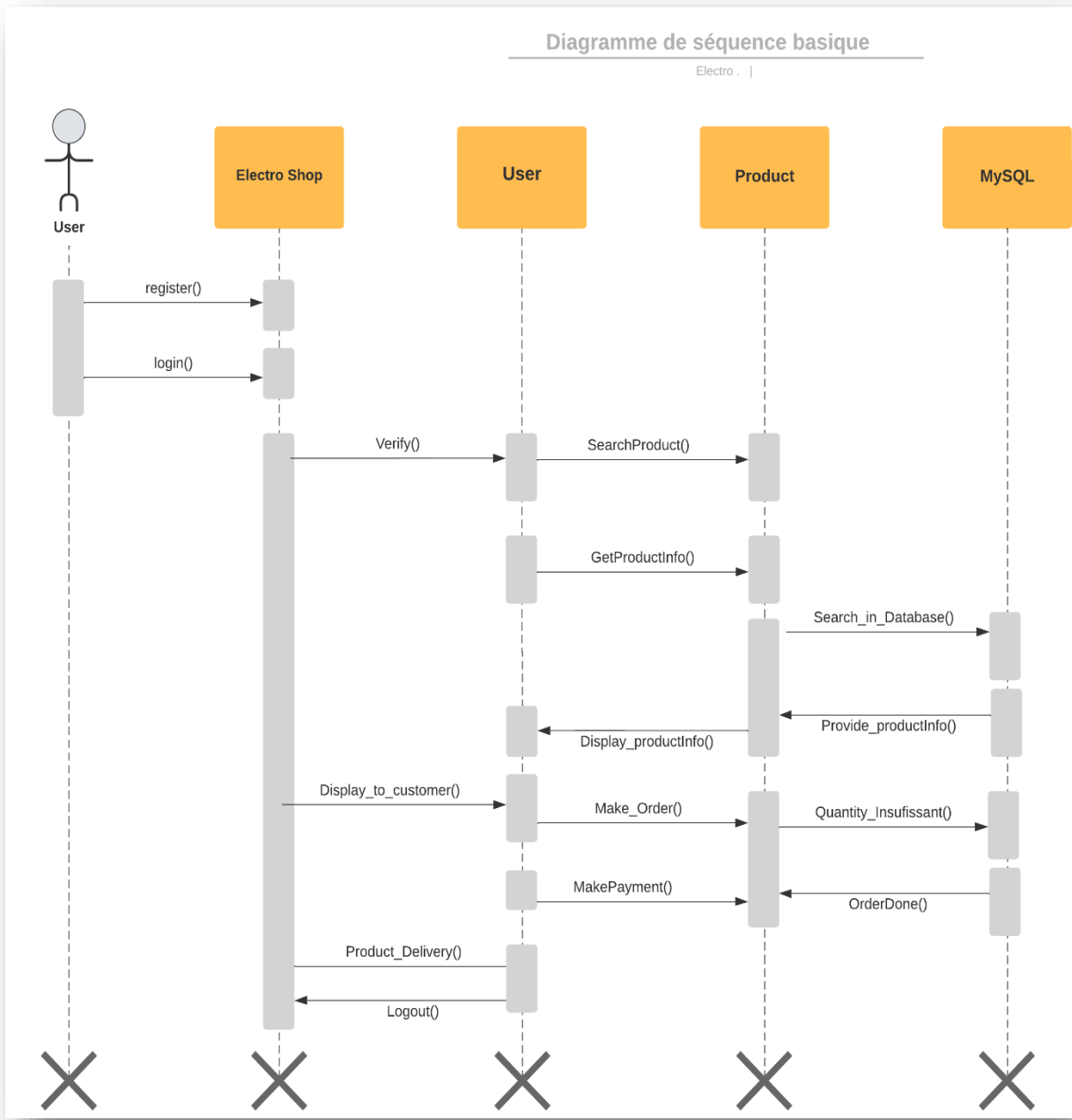


Figure 1.3: Sequence Diagram



### 1.4.8 State Transition Diagram

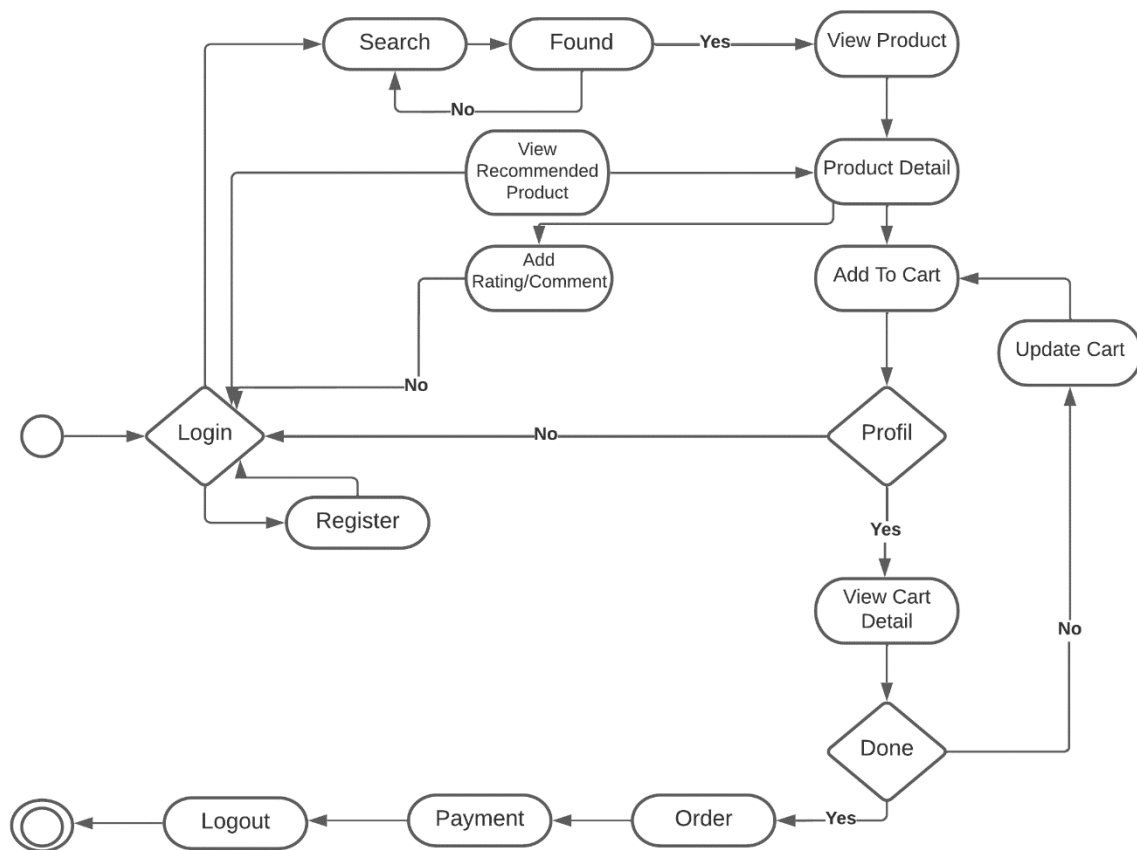


Figure 1.4: State Transition Diagram

### 1.4.9 Activity Diagram

#### 1- Activity Diagram for user

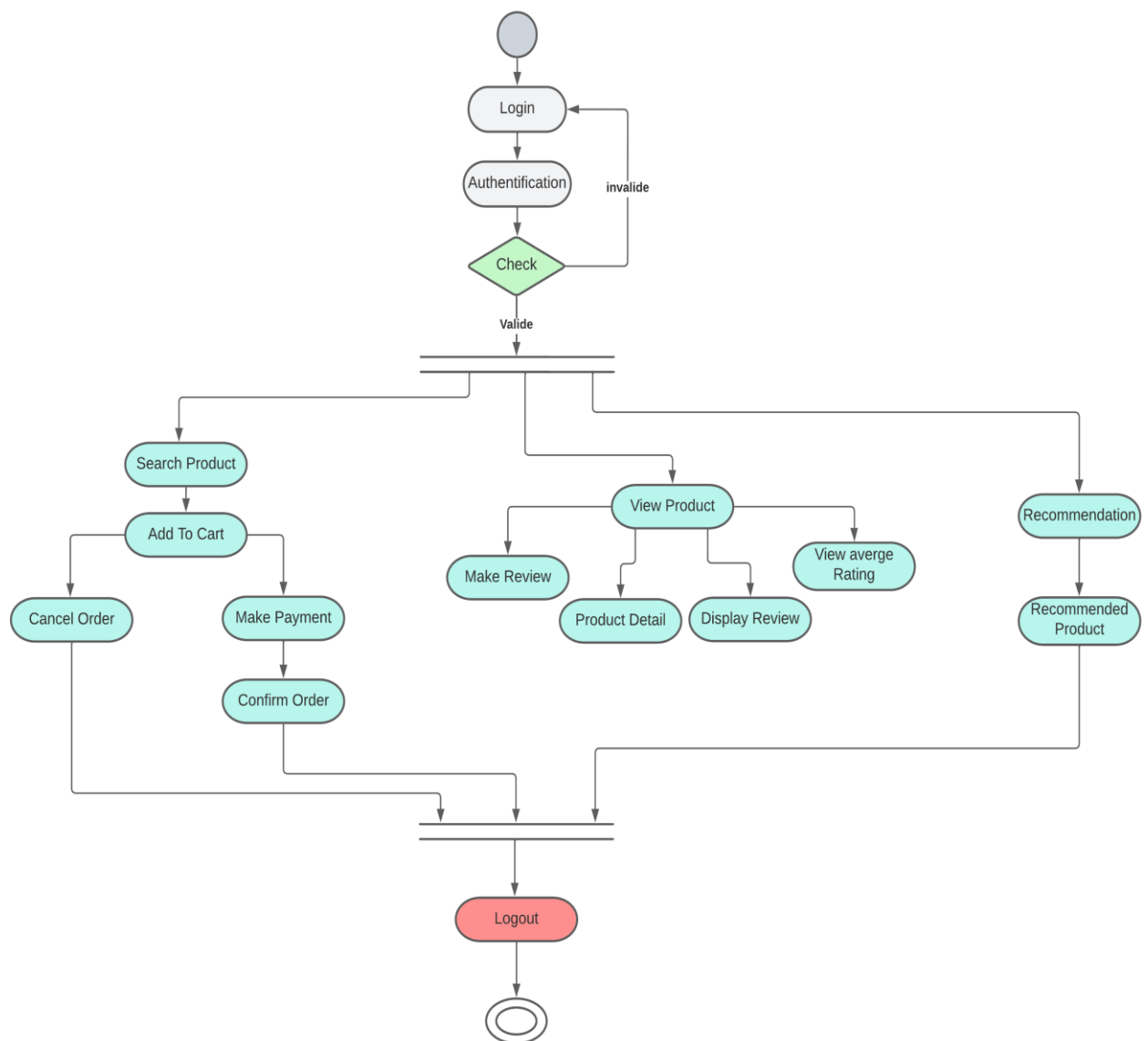


Figure 1.5: Activity Diagram for user

## 2- Activity Diagram for Admin

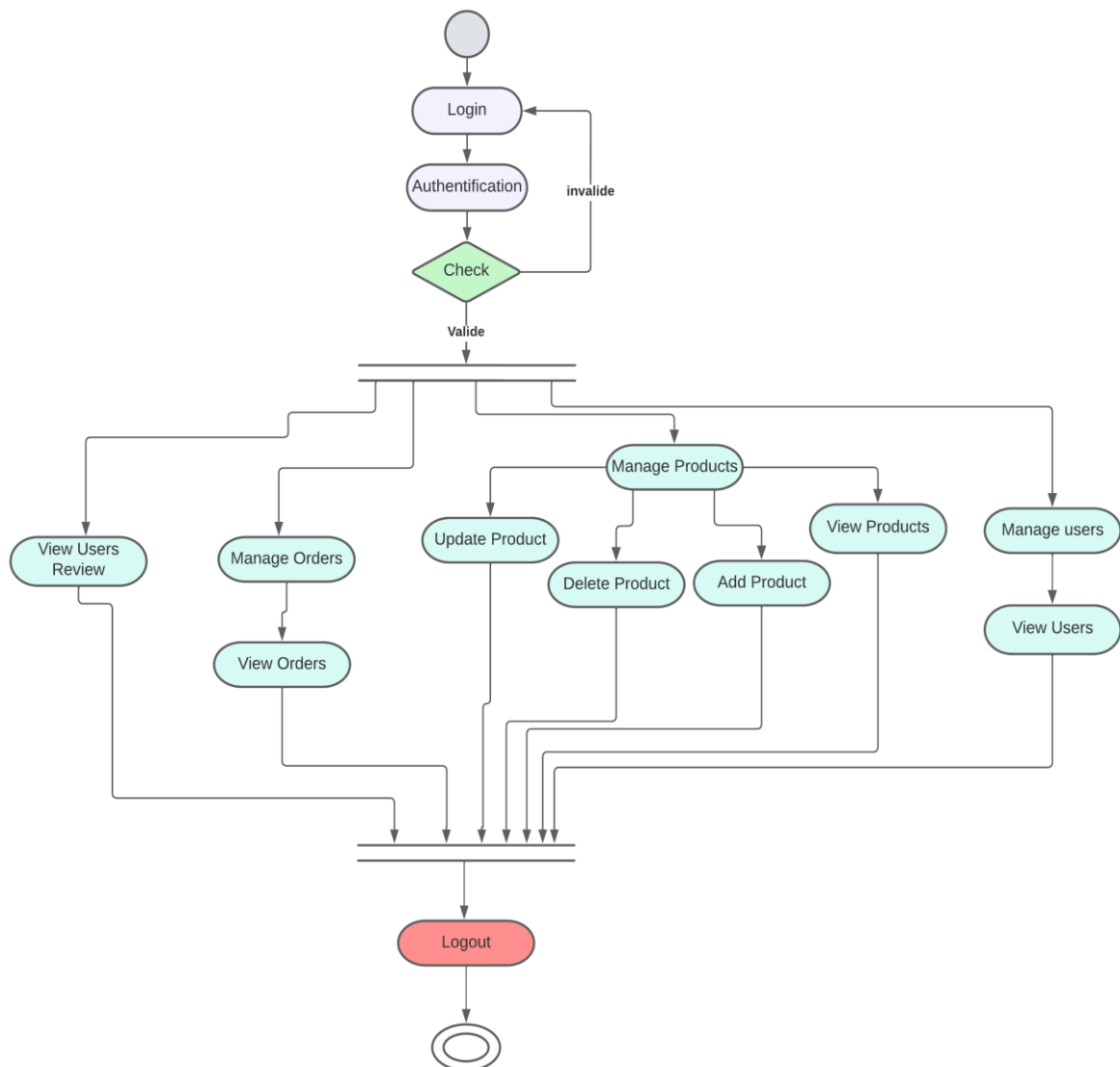


Figure 1.6: Activity Diagram for Admin

#### 1.4.10 Entity relational Diagram

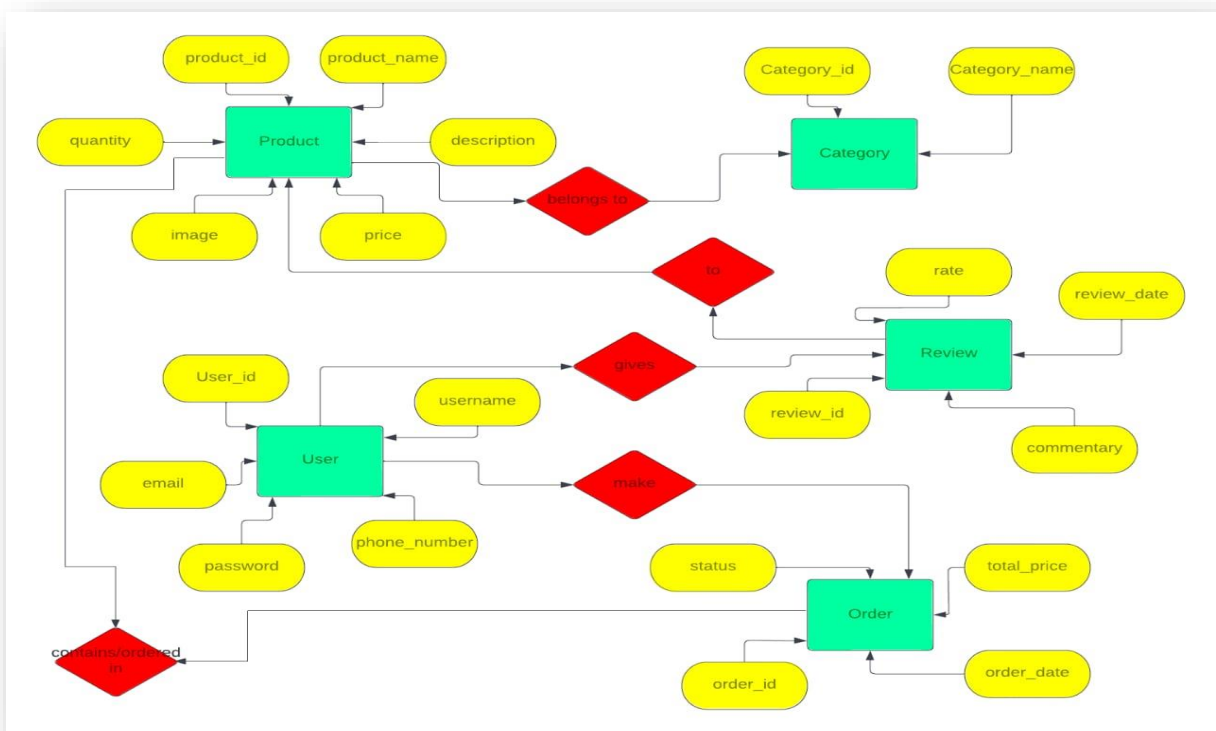


Figure 1.7: Entity relational diagram

1.4.11 Relational Model

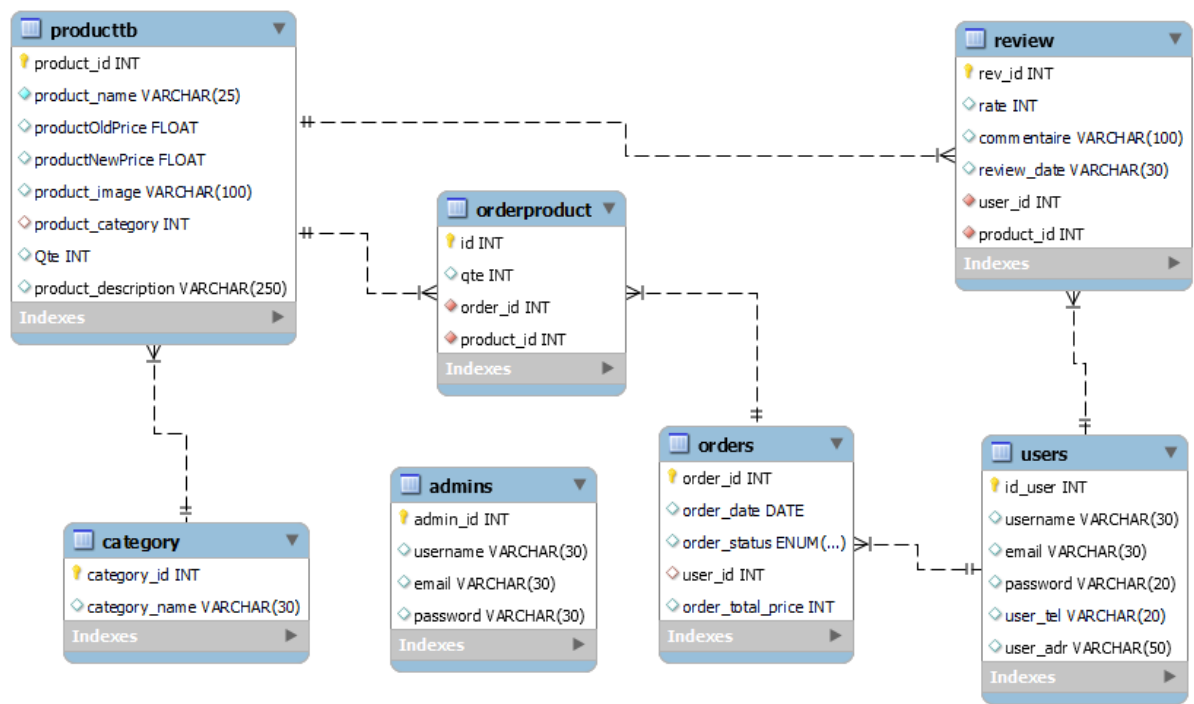


Figure 1.8: Relational model

---

## **1.5 Recommendation System**

### **1.5.1 What's the recommendation system?**

Recommender systems are the systems that are designed to recommend things to the user based on many different factors. These systems predict the most likely product that the users are most likely to purchase and are of interest to. Companies like Netflix, Amazon, etc. use recommender systems to help their users to identify the correct product or movies for them.

The recommender system deals with a large volume of information present by filtering the most important information based on the data provided by a user and other factors that take care of the user's preference and interest. It finds out the match between user and item and imputes the similarities between users and items for recommendation.

### **1.5.2 Why recommendation system?**

- Benefits users in finding items of their interest.
- Help item providers in delivering their items to the right user.
- Identity products that are most relevant to users.
- Personalized content.
- Help websites to improve user engagement.

### **1.5.3 Recommendation system in Ecommerce Industry?**

Recommendation engines is totally transforming or reshaping ecommerce industry by helping the customer to choose the relevant product. Recommendation system allows to increase the figures of sells, to offer more varied products, to improve user satisfaction and to fully consider customer needs. In simplest term recommendation engines are the ranked list of products to the user based upon different factors like user's preference and constraints.

### **1.5.4 How recommendation system works?**

Firstly is determining the constraints and preference, RS collects user's view with the help of ratings to the particular product in most of the cases. RS can also be called as

information retrieval as it is used to filter the system and display only item's that match the user's interest. For this, user must give some of interest to the system and system tries to display products user may like. If user does not give any information to the system, the system cannot provide any recommendation. Various tools are available to recommend the product. Most used recommender system in existing online environment are collaborative filtering, content-based filtering, Popularity based, Hybrid approach.

### 1.5.5 Types of recommendation system.

*The figure below illustrating different type of recommendation system*

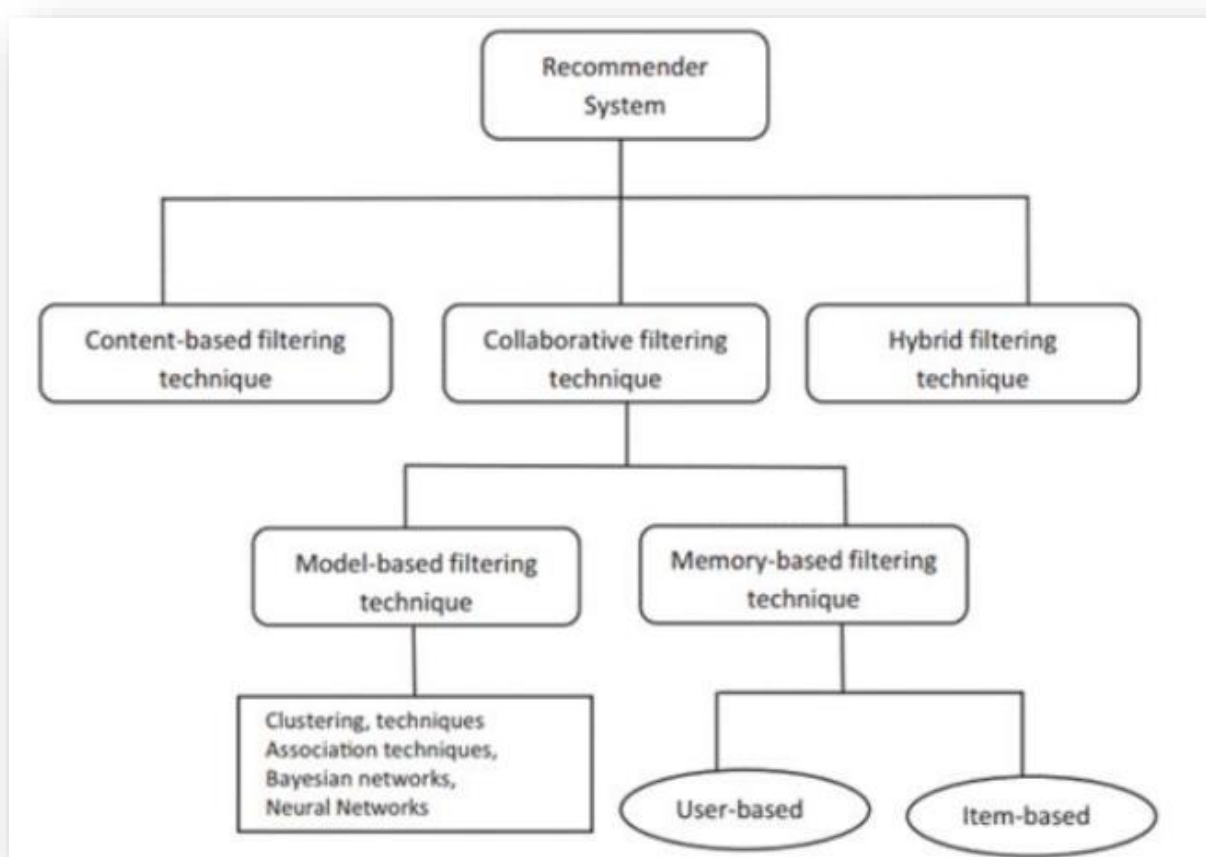


Figure 1.9: different type of recommendation system

### 1.5.6 Content-Based filtering.

Content-based (CB) filtering, also known as cognitive filtering recommends similar products that the user had already bought from the system. Content-based filtering can also recommend product to user with other factors like age, gender, geography, review,

---

usage pattern etc. The preferences of particular users can be determined by retrieval method such as cosine similarity matrix, term frequency-inverse document frequency, Long Distance Affair etc. or by using machine learning techniques like support vector machines, Naïve Bayes, decision trees etc. (Pazzani & Billsus, 2015)

### **1.5.7 Collaborative filtering (is the type we used in our website).**

Collaborative filtering is based on the idea that similar people (based on the data) generally tend to like similar things. It predicts which item a user will like based on the item preferences of other similar users.

Collaborative filtering uses a user-item matrix to generate recommendations. This matrix contains the values that indicate a user's preference towards a given item. These values can represent either explicit feedback (direct user ratings) or implicit feedback (indirect user behaviour such as listening, purchasing and watching).

There's two approaches for apply this type the first is:

- . Item to item collaborative filtering:** matches each of the user's purchased and rated items to similar items, then combines those similar items into a recommendation list.

- . User to user collaborative filtering:** is a technique used to predict the items that a user might like on the basis of ratings given to that item by the other users who have similar taste with that of the target user.

In our website we used the last approach because is widely used in many websites.

### **Steps for User-Based Collaborative Filtering:**

**What's the main goal behind these steps?**

➔ The main goal is to predict ratings for items which aren't predicted by user , so based on those predictions our system will recommend the items whose predicted rate is high (in our case we normalize the rates so the recommended products are those with predicted rate  $> 0$  ).

**Step 1: Finding the similarity of users to the target user U:**

For this purpose different algorithms are used, we used the Euclidian distance according to this algorithm the similarity between two users can be calculated as:

$$\text{Sim}(x, y) = \frac{1}{\sqrt{n}} \sqrt{\sum (x_i - y_i)^2}$$

$\text{Sim}(x, y)$  : similarity between user x and user y

$x_i$  : rate given by user x to the item i.

$y_i$  : rate given by user y to the item i.

### **Step 2: Prediction of missing rating of an item:**

Now, the target user might be very similar to some users and may not be much similar to the others. Hence, the ratings given to a particular item by the more similar users should be given more weightage than those given by less similar users and so on. This problem can be solved by using a weighted average approach. In this approach, you multiply the rating of each user with a similarity factor calculated using the above mention formula.

Predicted rate calculated as:

$$r_{xi} = \left( \sum \text{Sim}(x, y) * r_{yi} \right) / \sum \text{Sim}(x, y)$$

$r_{xi}$  : predicted rate of user x to the item i .

$r_i$  : rate given by user y to the item i .

(User y is an user belongs to the neighbourhood of user x)

### **✓ Application example:**



---

The table below shows a set of users and their rates to a set of products (A,B,C,D)

	A	B	C	D	E
user 1	4		3		
user 2	5	4	2	3	1
user 3			5	4	3
user 4	3	2		3	
user 5		4			2

Our goal is to predict the missing rates

- ➔ After following the steps above firstly we going to normalize the rates by calculate the mean of every row and subtract it from every rate by applying this formula:

$$\bar{r}_i = \frac{\sum_p r_{ip}}{\sum p}$$

Therefore we have

- $r_1 = 3.5$
- $r_2 = 3$
- $r_3 = 4$
- $r_4 = 2.67$
- $r_5 = 3$

- ➔ now we subtract these values from the values of every row and finally we get this table :

	A	B	C	D	E
user 1	0.5		-0.5		
user 2	2	1	-1	0	-2
user 3			1	0	-1
user 4	0.39	-0.72		0.33	
user 5		1			-1

➔ now we can start applying the Collaborative Filtering steps as shown above , firstly calculating the similarities between our target user and remaining users using Euclidian distance :

$$\text{Sim}(u_1, u) = \frac{1}{\sqrt{n}} \sum (U_{1i} - U_i)$$

- $\text{Sim}(u_1, u_2) = 1.58$
- $\text{Sim}(u_1, u_3) = 1.5$
- $\text{Sim}(u_1, u_4) = 0.11$
- $\text{Sim}(u_1, u_5) = 0$  ( this is clear because this user and user 1 have no common rate )

➔ after calculating the similarities now we can predict the rates by applying the formula of rate prediction

$$r_{u1i} = (\sum \text{Sim}(u_1, u) * r_{ui}) / \sum \text{Sim}(u_1, u)$$

We find:

- $r_B = 1.89$  (predicted rate of user 1 to product B)
- $r_D = 0.33$  (predicted rate of user 1 to product D)

- 
- $r_E = -1.51$  (predicted rate of user 1 to product E)

After predicting the missing rates, our system will only recommend products whose rate is high than 0

**Hence the predicted products for the user 1 are B and D.**

so far we have dealt with users who have already rated some products such the example above but what if an user did not rate any product yet or he don't have any historic inside the system or he is a new user, or there's no similar users or ....,how we could give him recommendations using the approach shown above ?

**To answer this question we have to discuss a problem called the cold start problem.**

### **1.5.8 What's the cold start problem and how to fix it?**

#### **1-The cold start problem definition:**

This term derives from cars. When it's really cold, the engine has problems with starting up, but once it reaches its optimal operating temperature, it will run smoothly. With recommendation engines, the "cold start" simply means that the circumstances are not yet optimal for the engine to provide the best possible results.

#### **2-The cold start problem solution:**

There's different approaches for provide a solution for this problem , but the simple one is to use **Popularity bias** which means recommend the most popular products or the most sold products

Until the circumstances are optimal to start recommending products

## **1.6 Conclusion**

In conclusion, this chapter gives a general idea of all that we need and the solutions that we offer to the Web-site for the best experience to customer and also for the Admin who will managing the project. Also, we propose the actors who can control or interact with the system using the conceptual diagram, which shows all the probability that we can conclude from the class diagram and the other diagrams.

# Chapter 2

## Functional Needs

### 2.1 Introduction

In this chapter, we see everything about the languages of the project, the frameworks used and the logical and physical architecture of the project, also we will give an idea of all the tools we use to develop our website. In order to do so. *a computer with the following functions is used to create this website:*

**Name:** HP 64bit.

**Processor:** Intel core i7.

**Storage:** 512 GB SSD.

**RAM:** 8Go.

### 2.2 E-commerce Architecture

#### 2.2.1 What is the importance of a good website structure?

Website architecture is the way information is laid out on a website. It includes organizing content so that users can quickly find what they are looking for.

There are two essential things to keep in mind:

A good e-commerce site architecture serves both humans and machines (sounds technical, but we will describe it in a more detailed and understandable way below).

A good site structure makes browsing intuitive. It thinks for users and predicts their further actions.

A poor e-commerce platform architecture is not intuitive. This makes it difficult for people to use your website and impossible for search engines to understand it.

On the other hand, a good site structure makes finding information simple and intuitive and thus does not require too much thought from users. Such content is also available for indexing by search engines, which deliver the content to users.

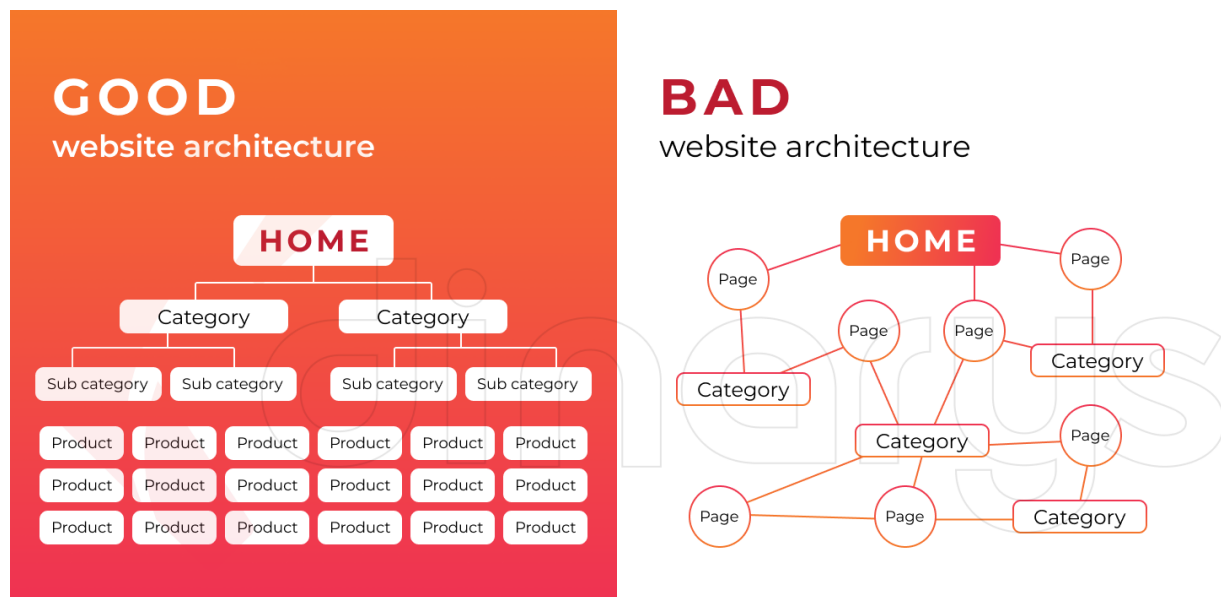


Figure 2.1: e-commerce architecture diagrams

The picture above shows two e-commerce architecture diagrams. One represents a good site architecture that organizes pages into ordered structures. The second illustrates a poor site architecture consisting of disorganized, disparate pages.

### 2.2.2 Types of E-commerce Architecture

Creating an e-commerce architecture allows you to make your website more interesting to visitors. Furthermore, resources with a well-thought-out structure are easier to promote, as they are better indexed and ranked. That is, a high-quality, logical website architecture not only allows you to effectively promote your project in the Internet space but also contributes to the influx of new customers, thus increasing your profits. We will describe several types of e-commerce website architecture, as well as their advantages and features.

- **Two-tier architecture**

Two-tier e-commerce website architecture involves the separation of information placement into two different spaces: the presentation (or interface) layer on the client side and the data layer on the server side. Dividing these components into two separate locations represents a two-tier architecture, as opposed to a single-tier architecture.

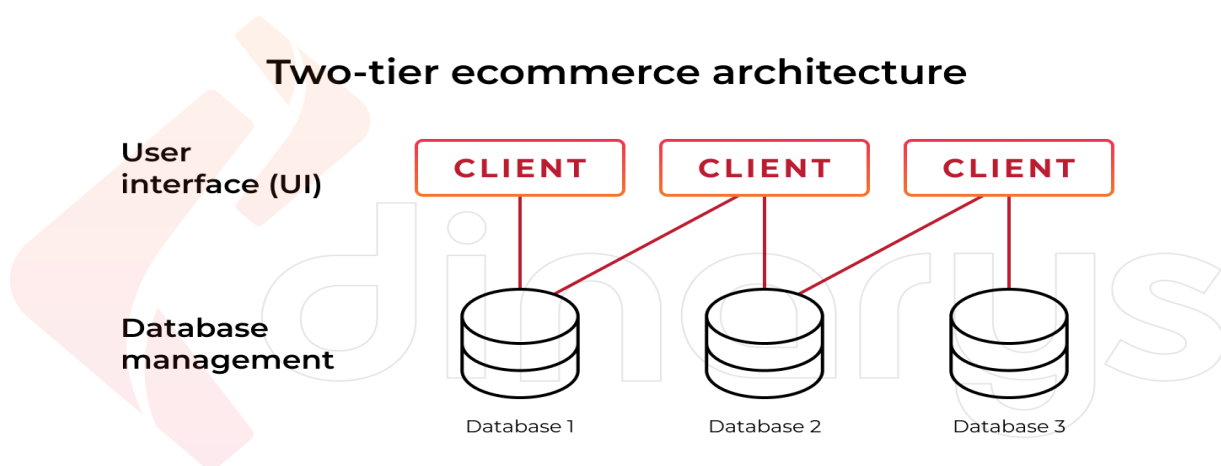


Figure 2.2: Two-tier architecture

- ✓ **Advantages of a two-tier architecture:**

- Reduces the load on both server and client machines.
- Reduces network traffic and increases the efficiency of data processing through input-output optimization and buffering.

- **three-tier architecture**

While two-tier website architecture is sufficient for many businesses, you may need three-tier e-commerce website architecture if you handle many processes and require more functionality.

Let us walk through a three tier architecture:

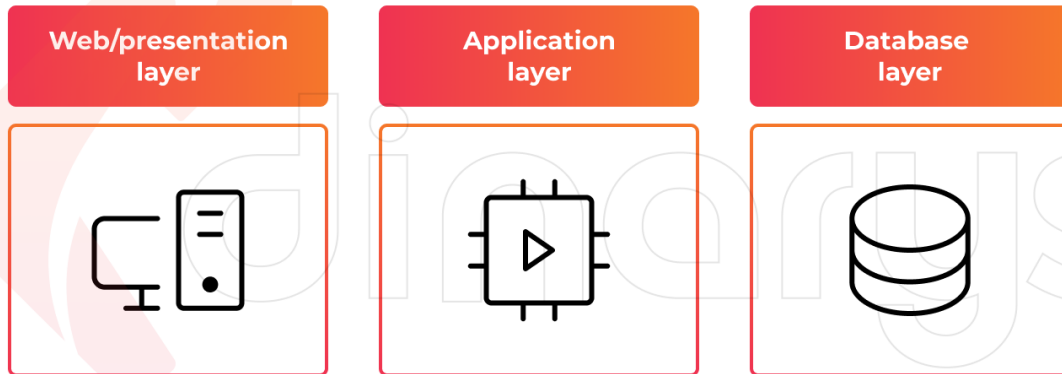


Figure 2.3: Three-tier architecture

A three-tier architecture is a well-established software application architecture that groups applications into three logical, physical computing layers:

- The presentation layer or user interface.
- The application layer, in which data is processed.
- The data layer, where the information is related to the application.

### 2.2.3 Mechanism for Transporting Information on the Internet

When two computers communicate to exchange information, they must use a common method of conversation. This is called a computer protocol, **TCP/IP**.

**HTTP** is the foundation of data communication for the World Wide Web (*WWW*), where Hypertext documents include hyperlinks to other resources that the user can easily access.

The application is based on the 3-tier architecture.

*Client program does not access the database directly, but an application server which itself accesses it.*

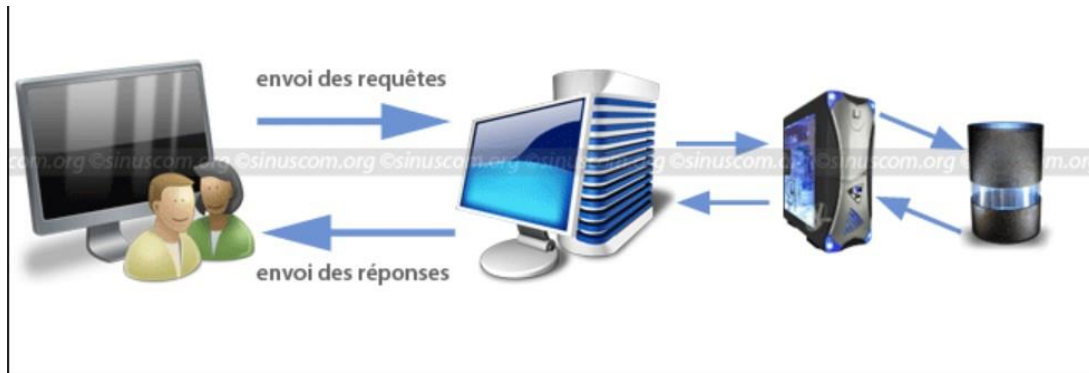


Figure 2.4-transporting information on internet

## 2.3 Programming Languages

*We give a general idea of all the languages that we used on the site.*

### 2.3.1 HTML

```
<tr class="row-1 row-first row-last">
  <td class="col-1 col-first">
    <div class="views-field views-field-title"> <span class="field-content"> <a href="/yellowleather/products/shoes">
    <div class="views-field views-field-uc-product-image">
    <div class="field-content">
      <a href="/yellowleather/products/shoes/confy-leather-shoes">  <span class="views-label views-label-display-price">
    </div>
  </td>
  <td class="col-2">
    <div class="views-field views-field-title"> <span class="field-content"> <a href="/yellowleather/products/belts">
    <div class="views-field views-field-uc-product-image">
    <div class="field-content">
      <a href="/yellowleather/products/belts/embossed-spread-wing-eagle-belt">  <span class="views-label views-label-display-price">
    </div>
  </td>
  <td class="col-3 col-last">
    <div class="views-field views-field-title"> <span class="field-content"> <a href="/yellowleather/products/hats">
    <div class="views-field views-field-uc-product-image">
    <div class="field-content">
      <a href="/yellowleather/products/hats/leather-hat">  <span class="views-label views-label-display-price">
    </div>
  </td>
</tr>
```

Figure 2.5: HTML

**HTML** is not a programming language; it is a Hypertext markup language that defines the structure of your content. HTML consists of several elements, which you use to enclose or wrap different parts of the content to make it appear a certain way or act a certain way. The enclosing tags can make a word or image hyperlink to somewhere else, can italicize words, make the font bigger or smaller, etc.



### 2.3.2 CSS



Figure 2.6: CSS

**CSS** stands for Cascading Style Sheets with an emphasis placed on “Style.” While HTML is used to structure a web document (defining things like headlines and paragraphs and allowing you to embed images, video, and other media), CSS comes through and specifies your document’s style—page layouts, colors, and fonts are all determined with CSS. Think of HTML as the foundation (every house has one) and CSS as the aesthetic choices (there’s a big difference between a Victorian mansion and a mid-century modern home).

### 2.3.3 Java Script



Figure 2.7: JS

**JavaScript** is a scripting or programming language that allows you to implement complex features on web pages.

every time a web page does more than just sit there and display static information for you to look at.

Displaying timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes, etc.

You can bet that JavaScript is probably involved. It is the third layer of the layer cake of standard web technologies, two of which (HTML and CSS) we have covered in much more detail in other parts of the Learning Area.

### 2.3.4 SQL



Figure 2.8: SQL

**Structured Query Language** , commonly known as SQL, is a standard programming language for relational databases. Despite being older than many other types of code, it is the most widely implemented database language.

Because SQL is so common, knowing it is valuable to anyone involved in computer programming or who uses databases to collect and organize information.

### 2.3.5 JQuery



Figure 2.9: JQuery

**JQuery** is a lightweight "write less, do more" JavaScript library. The purpose of jQuery is to make it much easier to use JavaScript on the website.

JQuery takes many common tasks that require many lines of JavaScript code to accomplish and wraps them into methods that we can call with a single line of code.

JQuery also simplifies a lot of the complicated things from JavaScript, like AJAX calls and DOM manipulation.

### 2.3.6 Bootstrap



Figure 2.10: Bootstrap

**Bootstrap** is the most popular HTML, CSS, and JavaScript framework for developing a responsive and mobile-friendly website.

It is free to download and use. It is a front-end framework used for easier and faster web development.

It includes HTML and CSS-based design templates for typography, forms, buttons, tables, navigation, modals, image carousels, and many others.

It can also use JavaScript plug-ins.

It facilitates you to create responsive designs.

### 2.3.7 (PHP: Hypertext Preprocessor)



Figure 2.11: PHP

*This is the Main programming language that helped us code more efficiently.*

**(PHP: Hypertext Preprocessor)** A scripting language that is widely used to create dynamic Web pages. Combining syntax from the C, Java and Perl languages, PHP code is embedded within HTML pages for server side execution. It is commonly used to extract data out of a database on the Web server and present it on the Web page. Originally known as "Personal Home Page," PHP is supported by all Web servers and widely used with the MySQL database.

## 2.4 API

### 2.4.1 PayPal Rest API



Figure 2.12: PayPal Rest API

**PayPal** offers online payment solutions and has more than 153 million customers worldwide. The PayPal API makes powerful functionality available to developers by exposing various features of the PayPal platform. Functionality includes invoice management, transaction processing and account management.

Using the Payments REST API for easily and securely accept online and mobile payments. The payments name space contains resource collections for payments, sales, refunds, authorizations, captures, and orders.

You can enable customers to make PayPal and credit card payments with only a few clicks, depending on the country. You can accept an immediate payment or authorize a payment and capture it later. You can show details for completed payments, refunds, and authorizations. You can make full or partial refunds. You also can void or re-authorize authorizations.

## 2.5 Development Tools

### 2.5.1 XAMPP

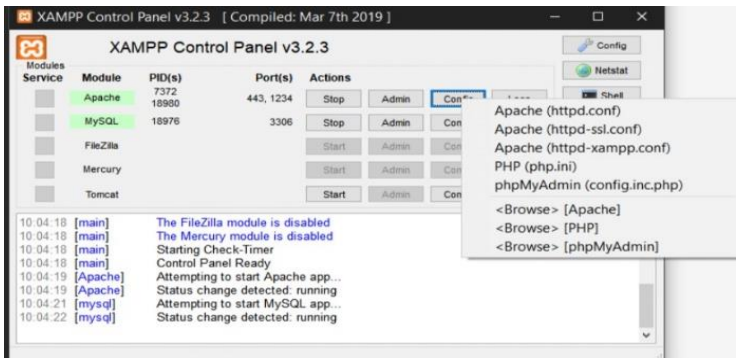


Figure 2.13: XAMPP platform

**XAMPP** is a free and open-source cross-platform web server solution stack package developed by Apache Friends,[2] consisting mainly of the Apache HTTP Server, Maria DB database, and interpreters for scripts written in the PHP and Perl programming languages [3][4]. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible.

**Component**

XAMPP is composed of many features like Apache, MySQL, FileZilla, Mercury, Tomcat, but in our project, we were interested in two features Apache & MySQL.

**2.5.2 APACHE**



Figure 2.14: Apache Software

**Apache** is the most widely used web server software. Developed and maintained by Apache Software Foundation, Apache is open-source software available for free. It runs on 67% of all web servers in the world. It is fast, reliable, and secure. It can be highly customized to meet the needs of many different environments by using extensions and modules.

### 2.5.3 MySQL & PhpMyAdmin

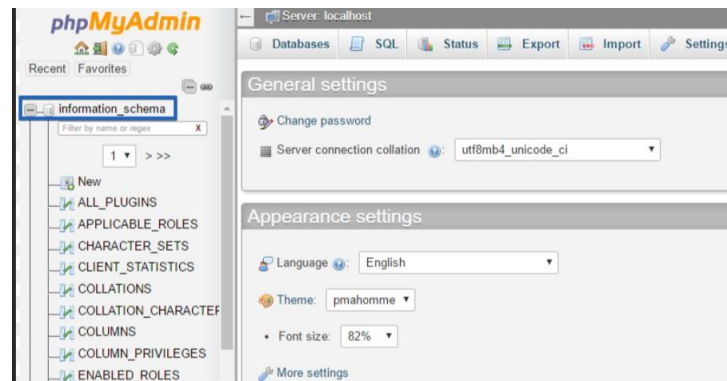


Figure 2.15: PhpMyAdmin Interface

**MySQL** is an Open Source relational database Management System.

MySQL Operates on almost every platform UNIX, Linux, and Windows. Although MySQL is used For many applications, it is most frequently associated with web applications and online Publications.

*The interface used in MySQL is PhpMyAdmin, **PhpMyAdmin** is an open-source software tool introduced on September 9, 1998, which is written in PHP. The primary purpose of PhpMyAdmin is to handle the administration of MySQL over the web. It is a third-party tool to manage the tables and data inside the database. PhpMyAdmin supports various types of operations on Maria DB and MySQL.*

### 2.5.4 Visual Studio Code

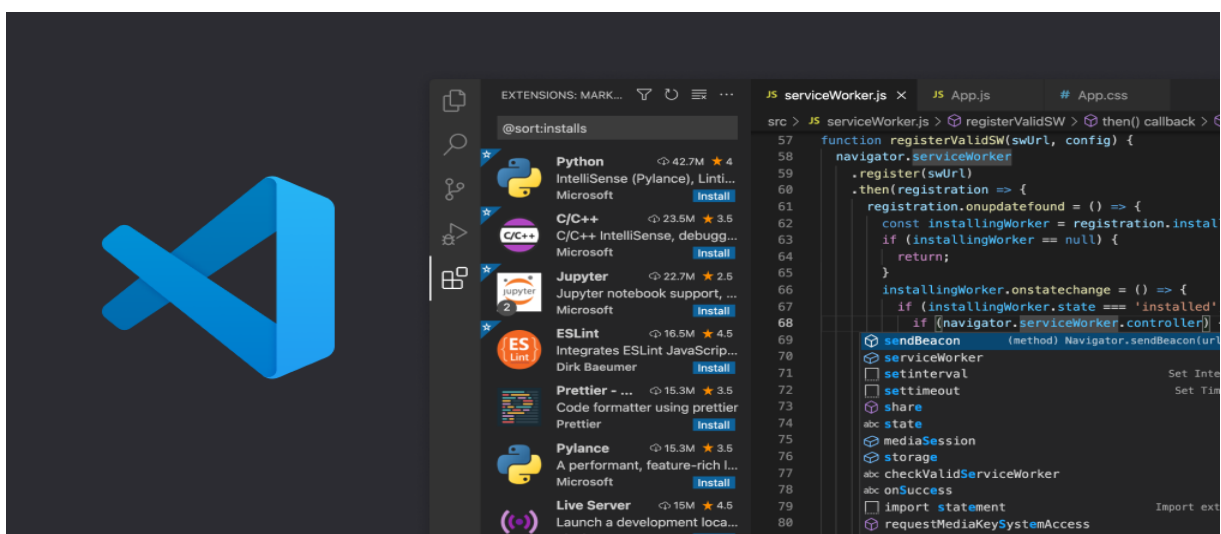


Figure 2.16: Visual studio Interface

**Visual Studio Code** is an extensible code editor developed by Microsoft for Windows, Linux, and macOS2.

Features include debugging support, syntax highlighting, smart code completion, snippets, code refactoring, and Git built-in. Users can change the theme, hotkeys, preferences, and install extensions that add additional functionality.

The source code for Visual Studio Code comes from Microsoft's VsCode free and open source software project released under the permissive MIT License, but the compiled binaries are freeware, that is, software free for any use but proprietary.

In Stack Overflow's 2021 Developer Survey, Visual Studio Code was ranked as the most popular development environment tool, with 71.06% of 82,277 respondents claiming to use it3.

## **2.6 Conclusion**

In this chapter, we have surrounded all the language we used in the project with some development tools, and we give a general idea of the e-commerce architecture to explain in more detail the path we took during this programming period and the Main programming language that helped us code more efficiently (PHP), and all the tools we use to store the information in the database. It is the supposed question that we worry about it.



## Chapter 3

# Developed Web Application

### 3.1 Introduction

This chapter gives an overview of all the PHP pages that we used in this project. Moreover, we will give an illustration for each page of our project.

### 3.2 Admin View

The Admin can control and change all products, users, orders and reviews so his page is sensitive and is not able to access it except in the case of logging in by the email and the Password of admin

#### 3.2.1 – Admin login

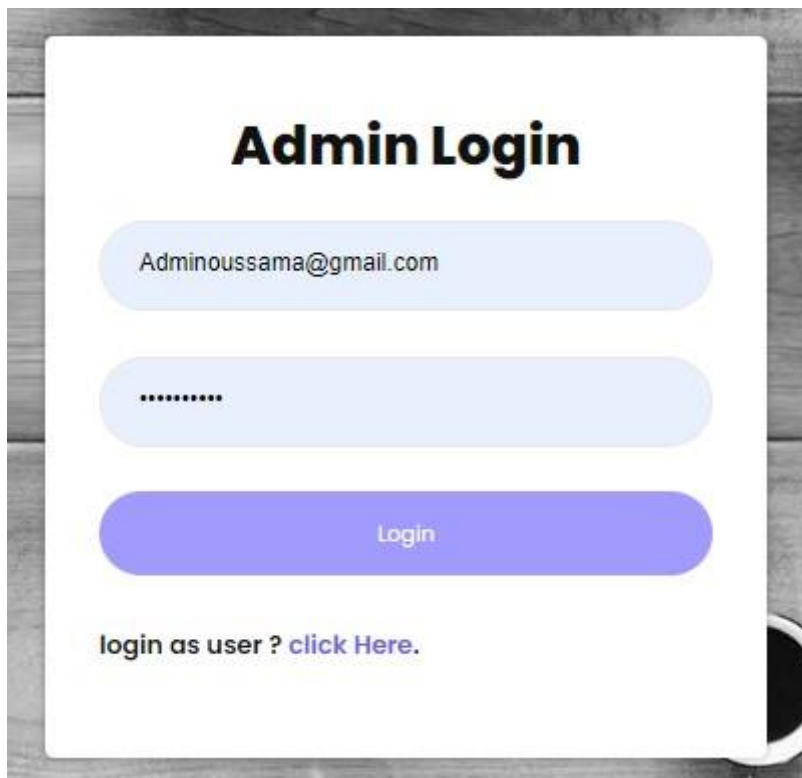
The image shows a web form titled "Admin Login" in bold black text. Below the title are three light blue rounded rectangular input fields. The first field contains the email address "Adminoussama@gmail.com". The second field contains a series of dots representing a masked password. Below these fields is a solid purple rounded rectangular button with the word "Login" in white text. At the bottom of the form, there is a link that says "login as user ? [click Here.](#)". The entire form is set against a light gray background with a subtle wood-grain texture.

Figure 3.1: Admin login Interface

### 3.2.2 – Admin Space

Once the System Verify that the information entered is correct. The system will take you to the main page of the admin:

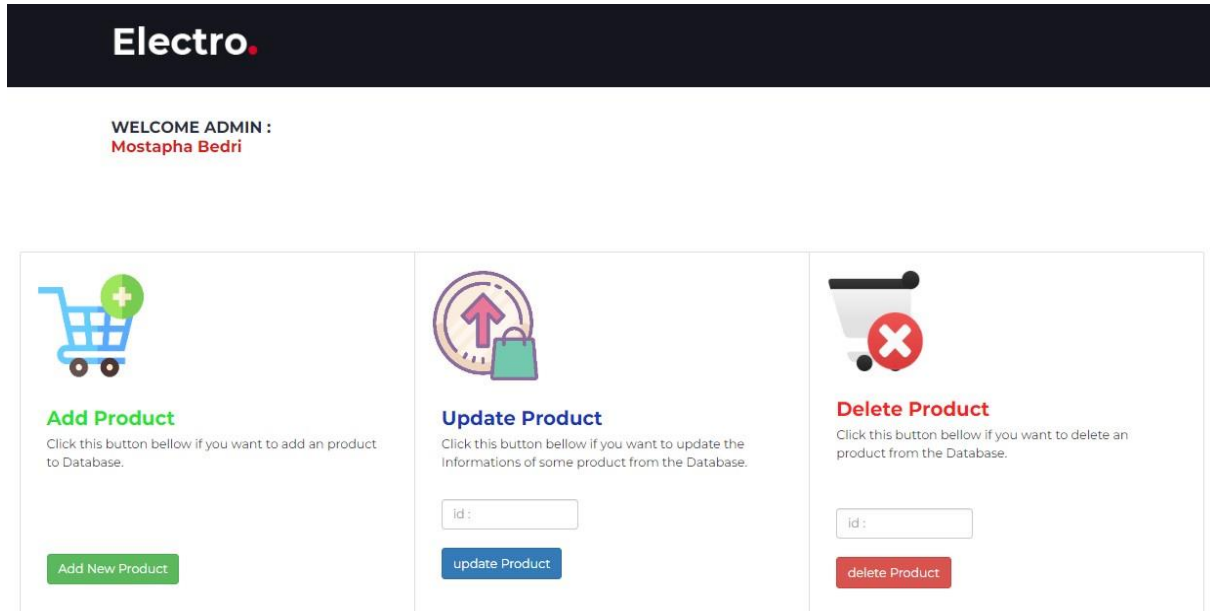


Figure 3.2: Admin page Interface 1

As you can see above the Admin can add, update and delete Product

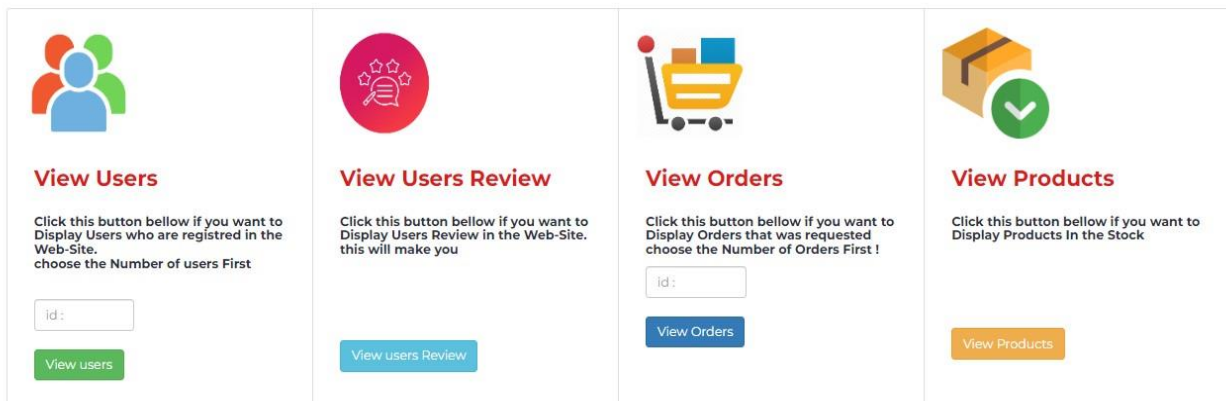


Figure 3.3: Admin page Interface 2

And also the admin can View users, products, orders and reviews from the Database.

#### 2-1 Add New Product Button



Product Name

Product Old Price

Product New Price

Product Image

Product Description

Product Category : Smartphone ▼

Product Quantity : 1 ▼

add Product

Figure 3.4: Add new product Interface

### 2-2 Update Product Button



Product Name

Product Old Price

Product New Price

Product Image

Product Description

Product Current Quantity :

Product New Quantity : 1 ▼

Product Current Category :

Product New Category : Smartphone ▼

Update Product

Figure 3.5: Update product Interface

After you select a product id the system will bring you the information of the product selected, then you can easily change the data

### 2-3 View Users Button

This Button will display the users who registered in the system.

### List Of Users who Registered

id_user	username	Email	TEL	Adresse
13	lboughaz	boch3ayebantaki@gmail.com	0618253625	nador - Fatwaki - rue 15
14	oussama gcc	ossama922@gmail.com	0618232315	Nador -ouled mimoun - rue al jazirra
16	elma	elmaelma@gmail.com	0748593351	Selwan - rue 30
17	kamalll mhiyeb	kamalpatera@gmail.com	0614253669	Nador , Poblaw
18	Nasredin 41	nasr@gmail.com	687862572	rue 3 mars , nador
22	manal lferkha	oussamgra997086088@gmail.com	0628877574	Nador - hotel Riyad
23	sofian 9orti	jadi@gmail.com	0606154878	rue 3 mars , numero 79

Figure 3.6: Users Registered Interface

### 2-4 View Users Reviews Button

#### List Of Users Reviews

review id	username	product id	product Name	rate	commentary	review Date
12	kamalll mhiyeb	3	Sony Xperia Z4	5	tooppp	2022-05-27 16:23:50
11	Nasredin 41	20	Apple Mackbook pro 12	2	kolchi naadi	2022-05-26 15:35:08
10	kamalll mhiyeb	4	Samsung Galaxy TAB 3	5	super !!!!!!!!!!!!!!!!!!!!!	2022-05-23 17:21:12
9	kamalll mhiyeb	15	Sony Xpiria Headphones	1	mmmm la la 3iyaan akhuya	2022-05-21 03:17:09
8	kamalll mhiyeb	5	smartphone a50 +	2	a7ssan likit f l3alam	2022-05-21 02:44:53
7	kamalll mhiyeb	10	samsung s9 +	5	wolahela wa3ra bejjahed hadche LE3ezz bikkooommm TOOP	2022-05-19 16:55:14
6	elma	4	Samsung Galaxy TAB 3	5	wolahela hadch 3andkomm wa3er le3ezzz	2022-05-19 03:08:58
5	elma	4	Samsung Galaxy TAB 3	4	mabillhech	2022-05-18 23:36:53
4	elma	4	Samsung Galaxy TAB 3	4	c'est gentiiiiiii	2022-05-18 23:35:37
3	elma	7	HP E1500	5	chahaja lekher	2022-05-18 23:34:51
2	elma	7	HP E1500	4	GOOOOD !!!!!	2022-05-18 23:34:07
1	elma	7	HP E1500	2	moyeeen	2022-05-18 23:29:53

Figure 3.7: Users Reviews Interface

This Button display user's reviews in the system.

### 2-5 View Products Button

This button will display the products in the stock with all his attributes such as the quantity of the product to know if some product no longer available

### List Of Products In the Stock

Product Id	Product Name	Old Price	New Price	Product Image	Product Category	Product Quantite	Product Description	Product Rate
4	Samsung Galaxy TAB 3	278	179		smartphone	50 Items	L'écran de 10,5 pouces, avec ses bordures de seulement 10,2 mm, vous permet de profiter d'une expérience de visionnage immersive. Explorez, sans compromis. Qu'il s'agisse de regarder des films d'actions ou de suivre des tutoriels, la Galaxy Tab A8 vo	2
19	Tablette Educative	200	150		smartphone	20 Items	ANYWAY.GO Tablette pour Enfants 10.1 Pouces, Android 10.0 Kid Tablettes, HD Screen, Quad Core, 2GB RAM 32GB ROM, Kidz Pré-Installé, avec WiFi Bluetooth, Double Caméra Tablette Éducative (Blue)	3
1	Apple MacBook Pro 1	700	559		laptop	1 Items	Processeur et mémoire :Processeur Intel Core i5-1135G7 de 11e génération.RAM 16 Go DDR4 2666 MHz.	1
3	Sony Xperia Z4	519	419		laptop	14 Items	16 Go de mémoire RAM DDR4-2933 MHz + Stockage Disque dur SSD : 1 To Système d'exploitation Windows 10 Famille 64 + Clavier AZERTY rétroéclairé + Système audio Bang & Olufsen Autonomie : jusqu'à 10h + Charge rapide (environ 50% de batterie en 30 minut	5
7	HP E1500	700	100		laptop	14 Items	16 Go de mémoire RAM DDR4-2933 MHz + Stockage Disque dur SSD : 1 To Système d'exploitation Windows 10 Famille 64 + Clavier AZERTY rétroéclairé + Système audio Bang & Olufsen Autonomie :	0

Figure 3.8: Products Interface

## 2-6 View Orders Button

### List Of Orders that was requested

order_id	user Name	order_products	order_date	order_total_Price	order_Methode	Paypal_order_Id
97	elma	test osafi	2022-07-02	25\$	cash in delivery	null
96	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
95	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
94	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
93	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
92	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
91	elma	laptop ra2i3 - Sony E7 Headphones	2022-06-23	279\$	cash in delivery	null
90	elma	Sony Xperia Z4 - samsong s90 + - Sony E7 Headphones	2022-06-06	918\$	cash in delivery	null
89	elma	Sony Xperia Z4 - samsong s90 + - Sony E7 Headphones	2022-06-06	918\$	cash in delivery	null

Figure 3.9: Orders Interface

This button display orders that was done, by showing the name of the customer who made the purchase and the products name who bought them.

## 3.3 User View

### 3.3.1- User Login

this is the user login interface which enables him to log in so that the system remembers the actions he has done

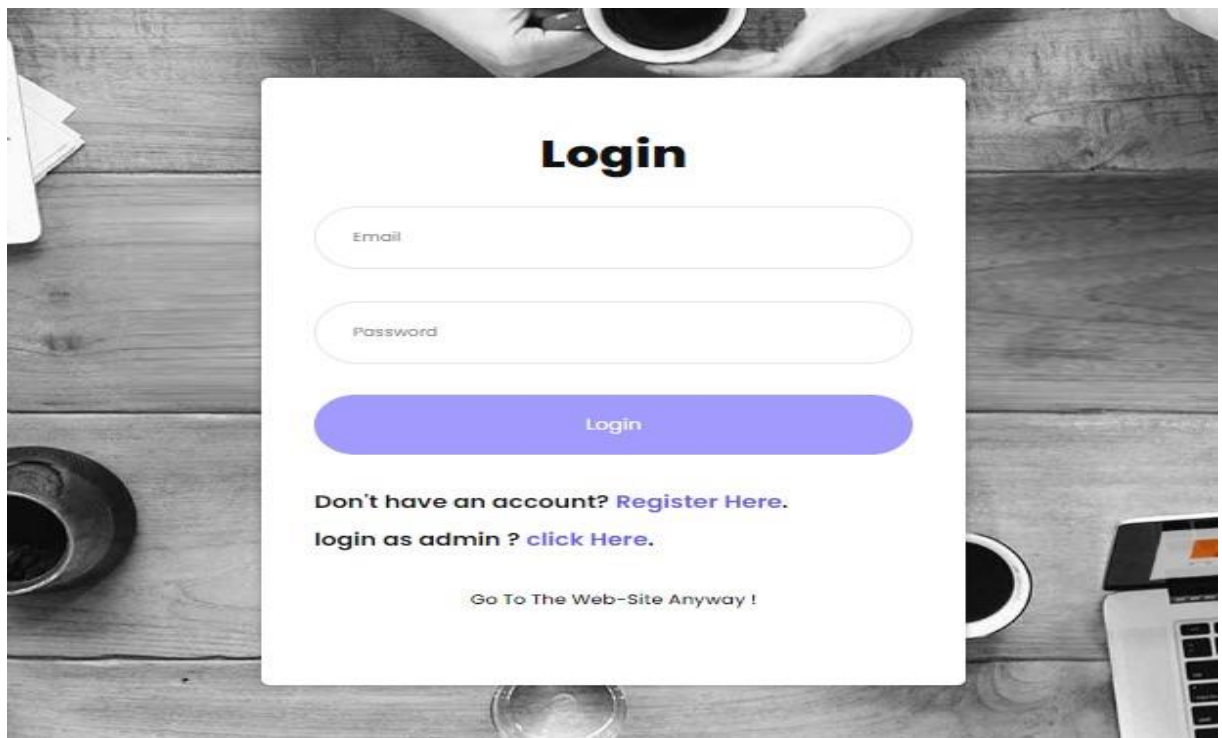


Figure 3.10: User login Interface

As you can see if someone doesn't have an account they can register and create a new account.

### 3.3.2- User Register

*This is the register page.*

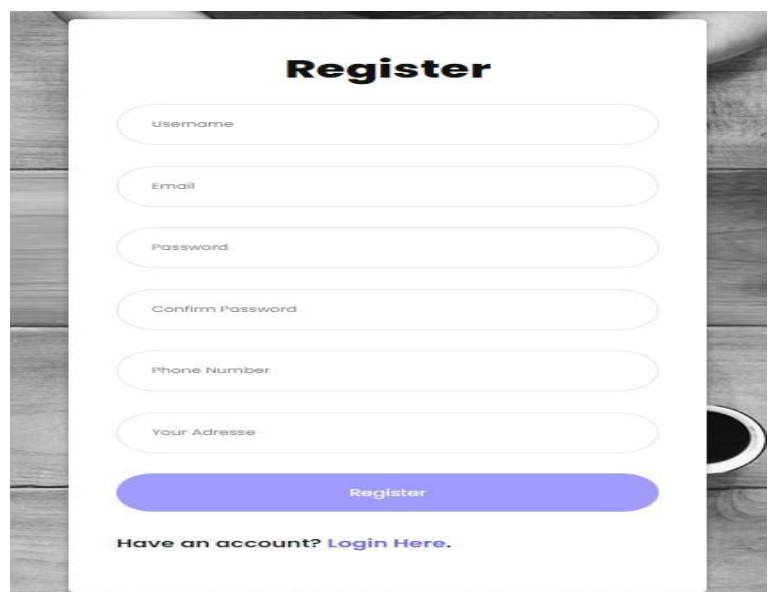


Figure 3.11: User Registered Interface

Registration is not necessary in order to view and browse the site, so we have provided a button in order to go to the site directly without registering

### 3.3.3- Home Page

We will display all contents that we have in the home page. This is the first page that opened when person access to our site.

#### 1 - Navbar

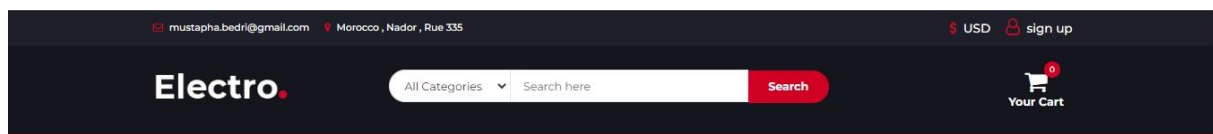


Figure 3.12: Navbar Interface

The Navbar in our website contains the logo, search bar, your cart button and the sign up button.

#### 2 - Category carts

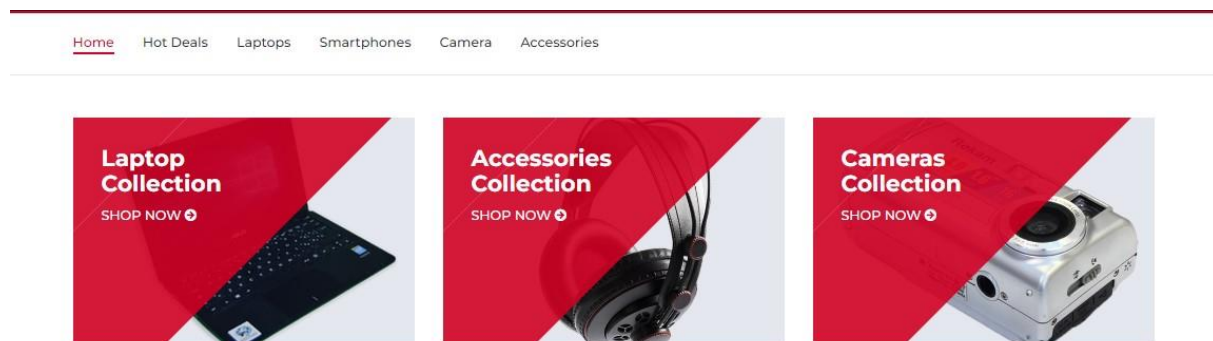


Figure 3.13: Category carts Interface

Under the Navbar there is carts for display product category. You can view product with a specify category by clicking to the “shop Now” button inside every cart.

#### 3 - Product Display



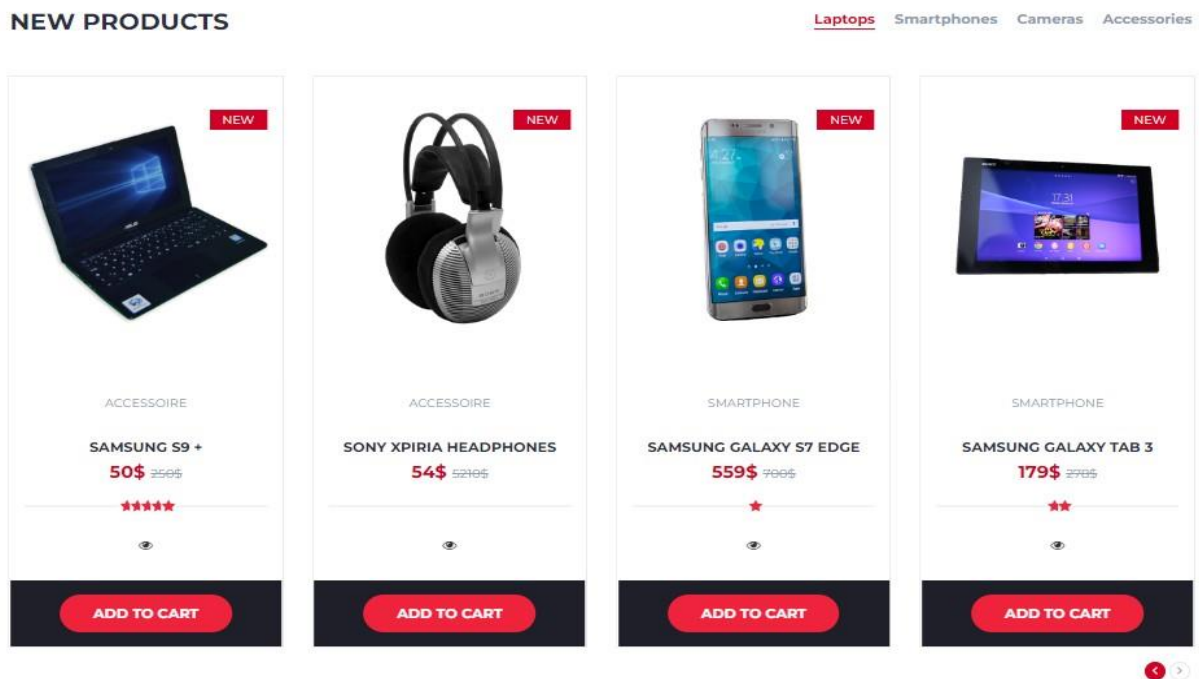


Figure 3.14: Product display Interface

You can see here carts for every single product in our Database.

#### 4 – Discount products



Figure 3.15: Product discount Interface

You can see here the products that have a discount with a timer showing the remaining period of the discount.

#### 5 – Recommended products

This slide show the recommended products for the user.



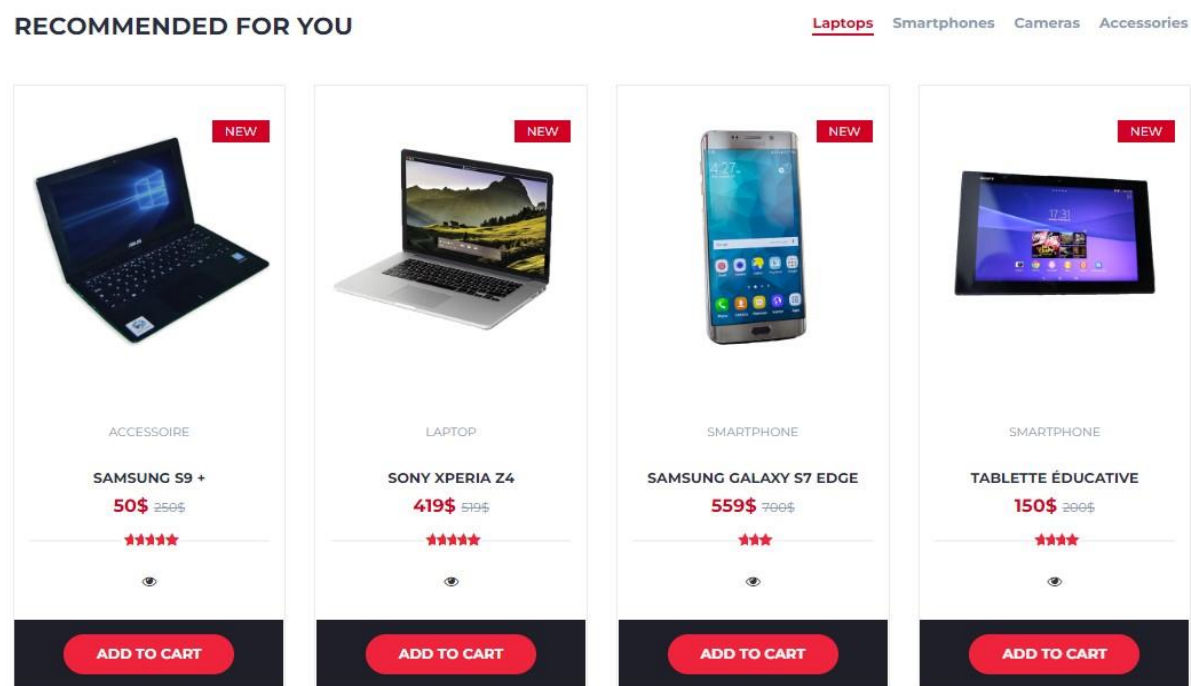


Figure 3.16: Recommended Product Interface

## 6 – Best Selling

In case if the person doesn't registered we recommended to him the best-selling (The most product sales in our site).

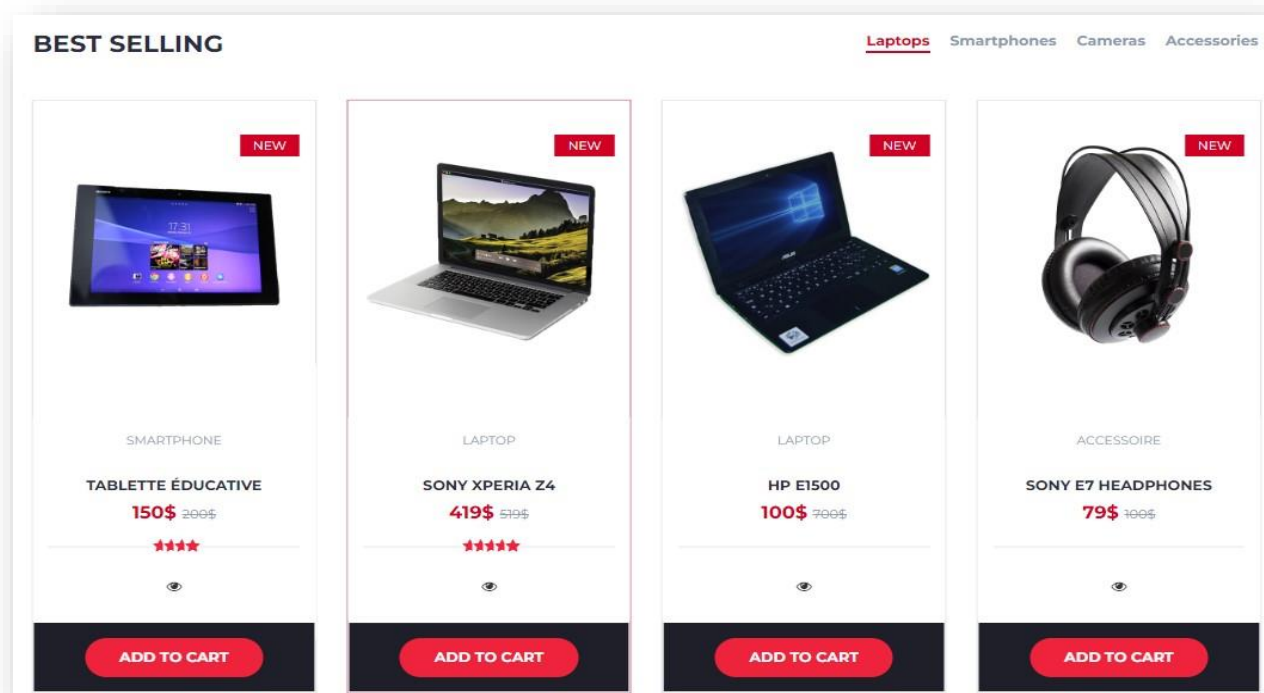


Figure 3.17: Best-selling Product Interface

### 7 – Footer

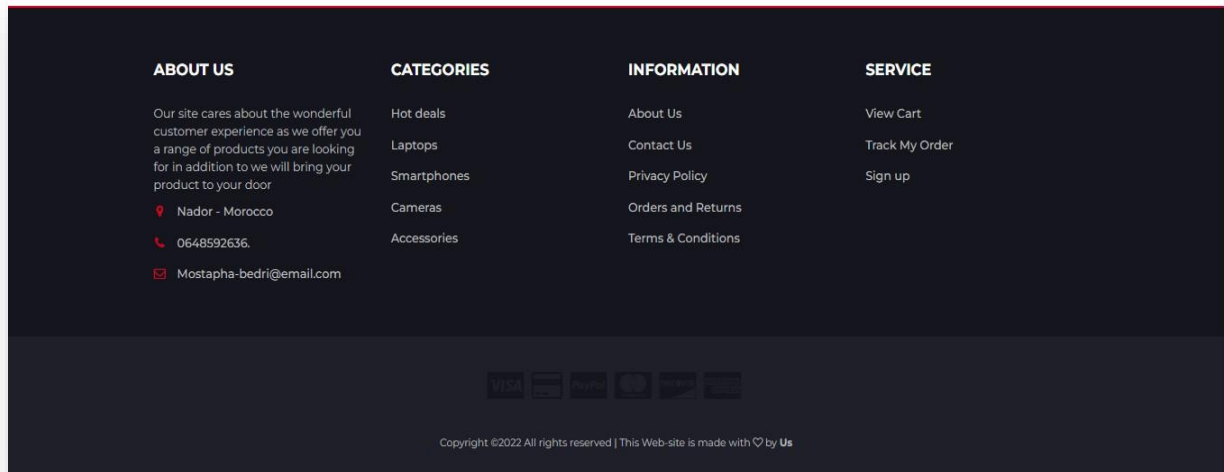
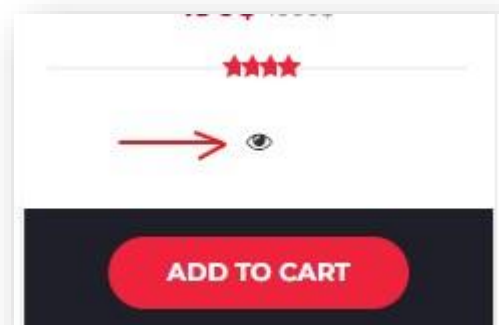


Figure 3.18: footer Interface

The importance of the footer lies in giving visitors to the site another opportunity to take the required action. If you want people to sign up, view the Cart, track the order or contact you They offer a way to continue sharing. By including navigation links in the footer, you make it easier for site visitors to keep exploring without forcing them to scroll back up.

### 3.3.4- Product Page.

As we saw earlier the product cart has a button if the customer wants to see the product details. Once you click on the button the programme will show you detailed information on the product. With the possibility of doing several features such as seeing the rating of the product, display other user's reviews of the product and add your personal product review.



*This is the interface of the product Page:*

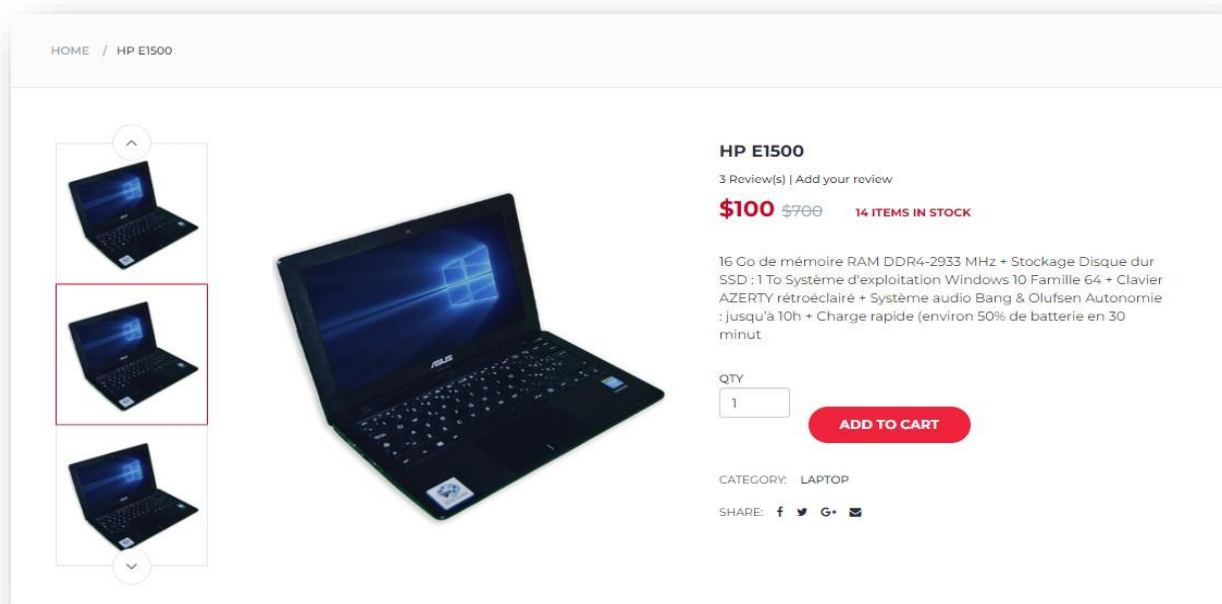


Figure 3.19: Product Detail Interface

### 1- Product Reviews

Here are the reviews submitted by previous users:

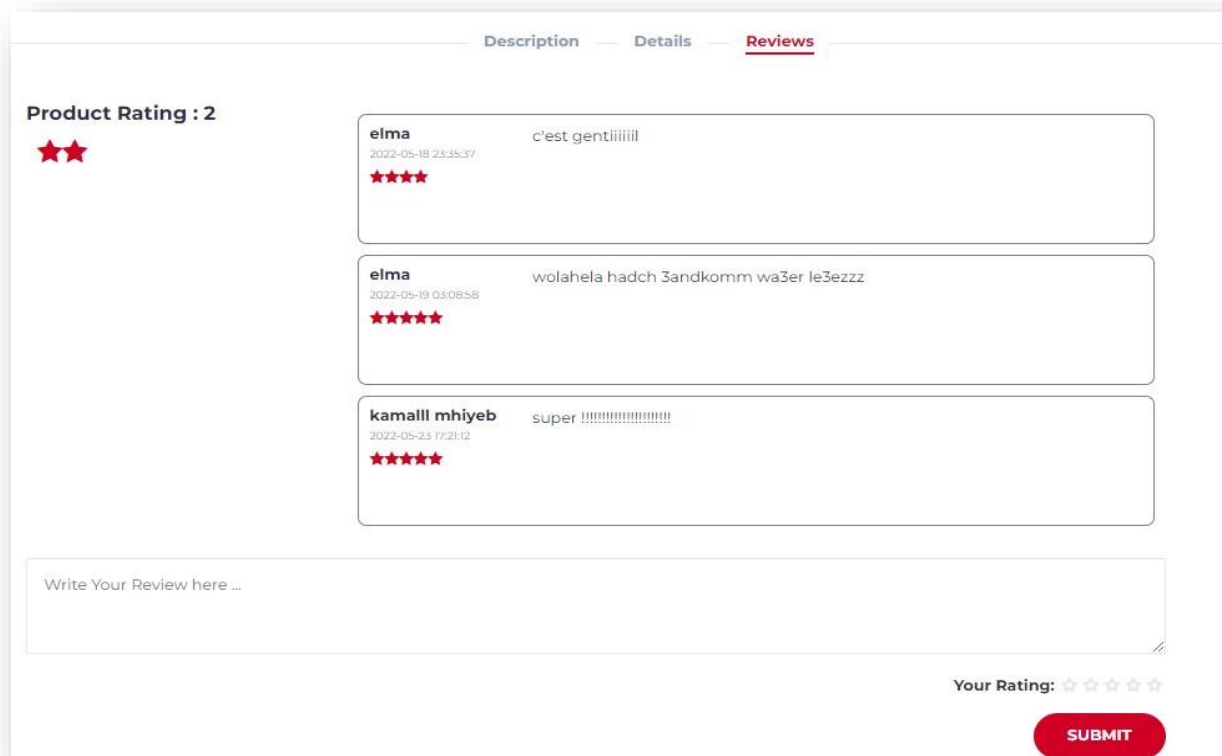


Figure 3.20: Reviews Interface

## 2- Product Related

At the end of the product page we displayed the products that are related to the product that the customer has seen in detail (*This is part of providing the best possible customer experience*)

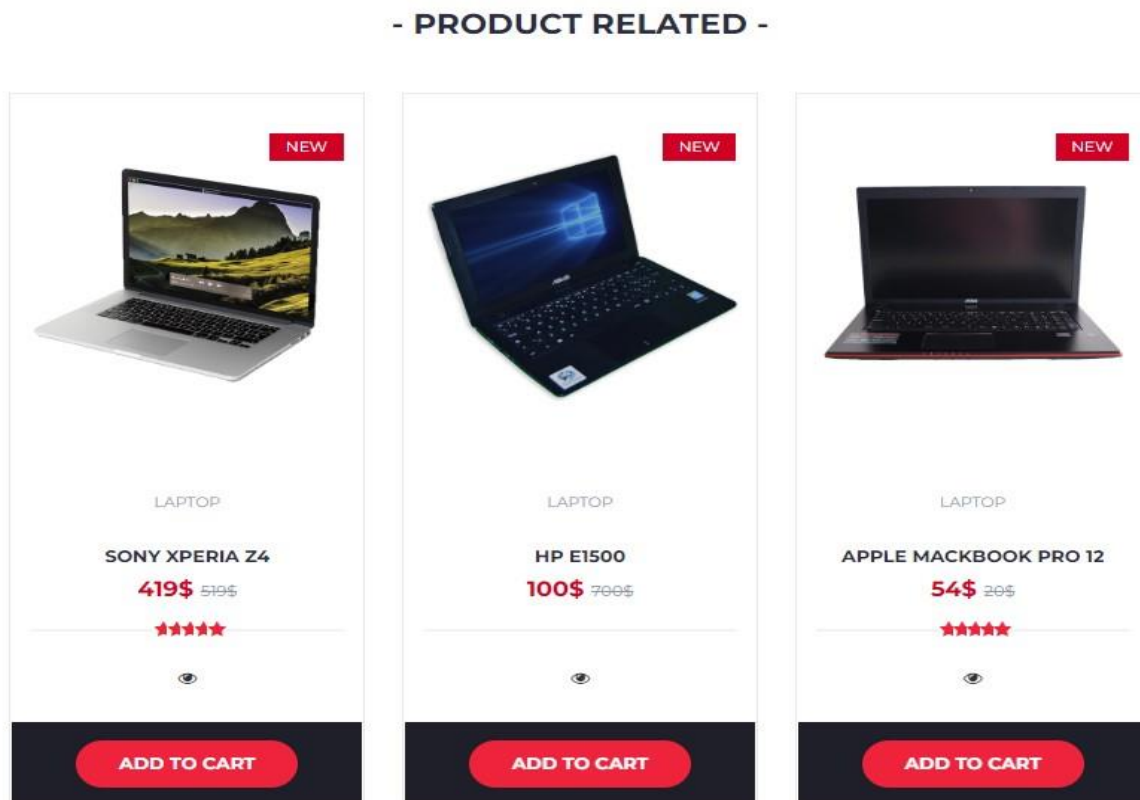


Figure 3.21: Product related Interface

As we saw before, we choose a product in laptop category, so the system displayed product related in the same category.

### 3.3.5 – Shopping Cart Page

Shows here the products that the customer has added to the shopping cart.

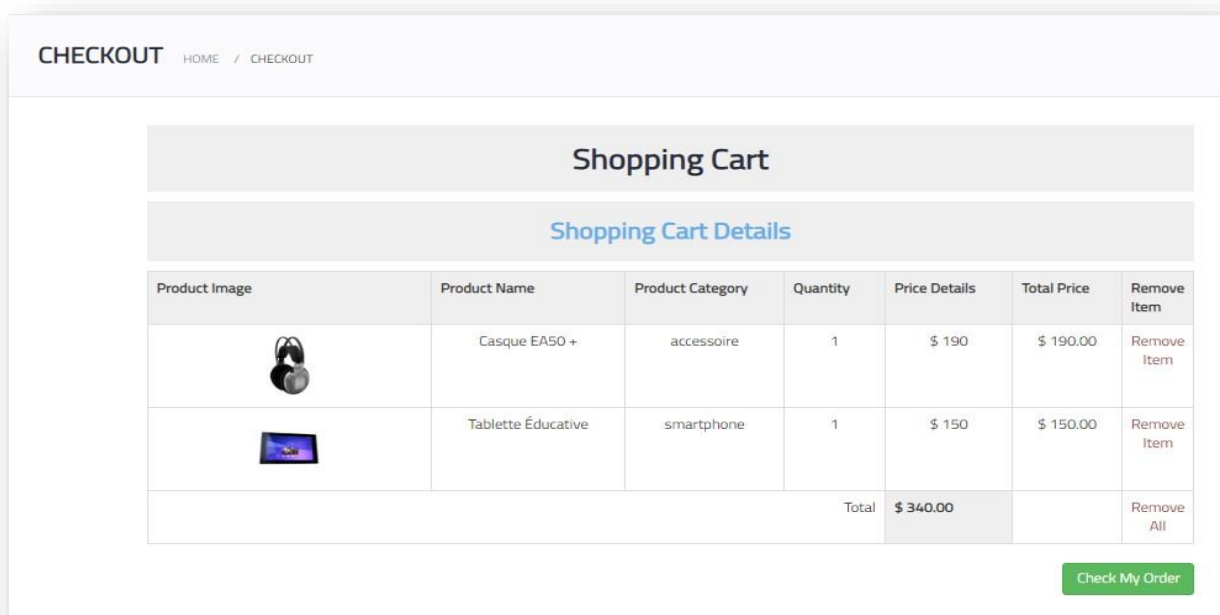


Figure 3.22: Shopping cart Interface

### 3.3.6– Check order page

Once the user click on the “check my order” button this page will display:

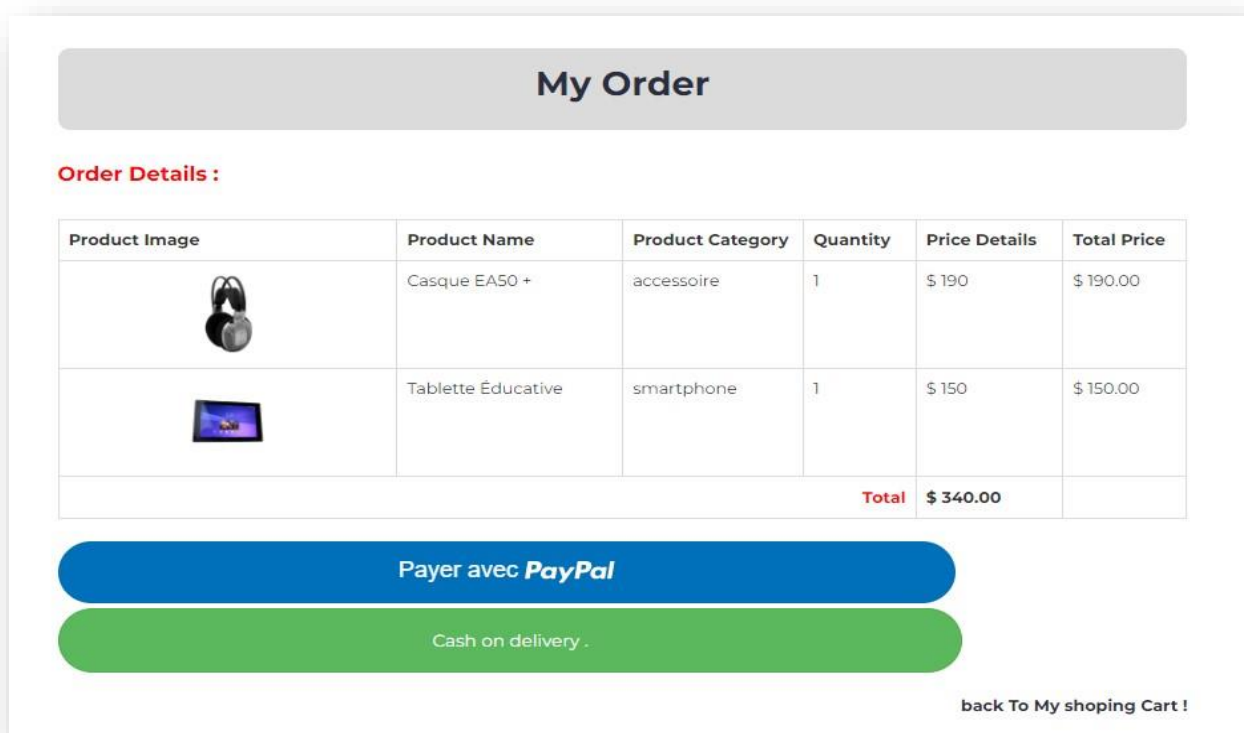


Figure 3.23: My order Page

Here we suggest to the customer two methods of payment. Payment method via PayPal or cash on delivery.

-if the customer click **the PayPal button** the following will be displayed:

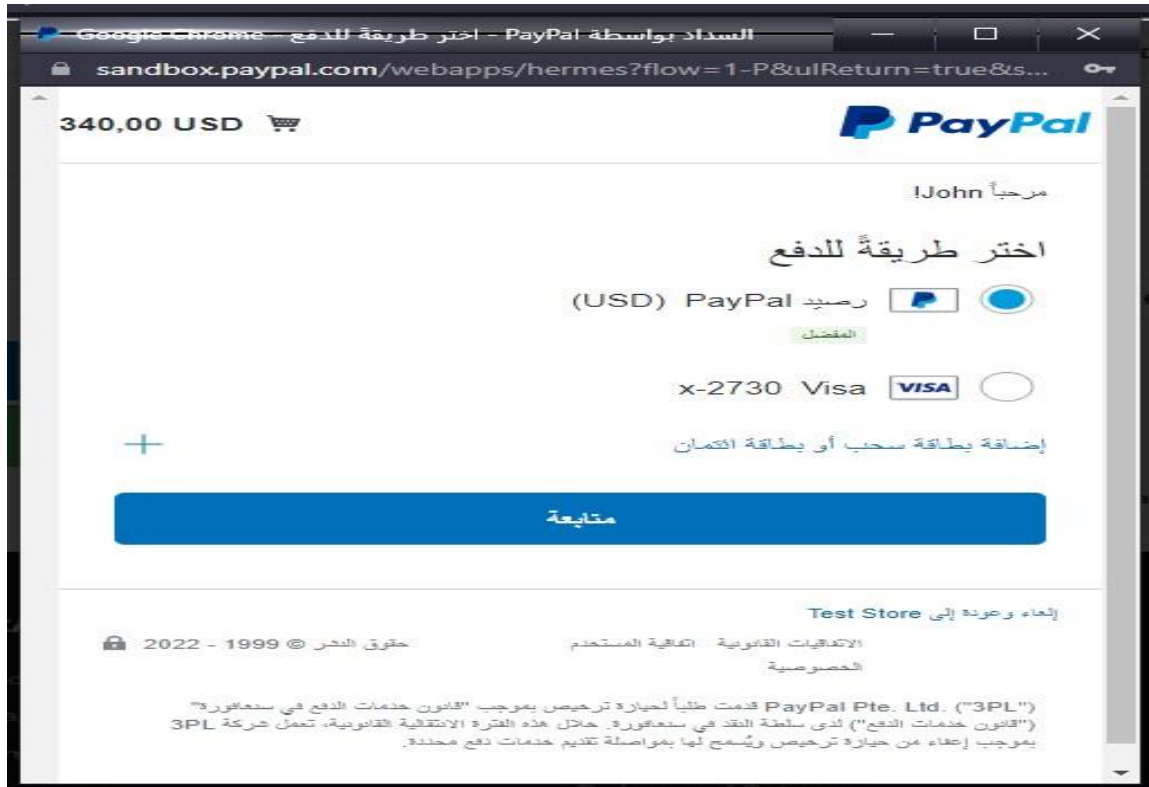
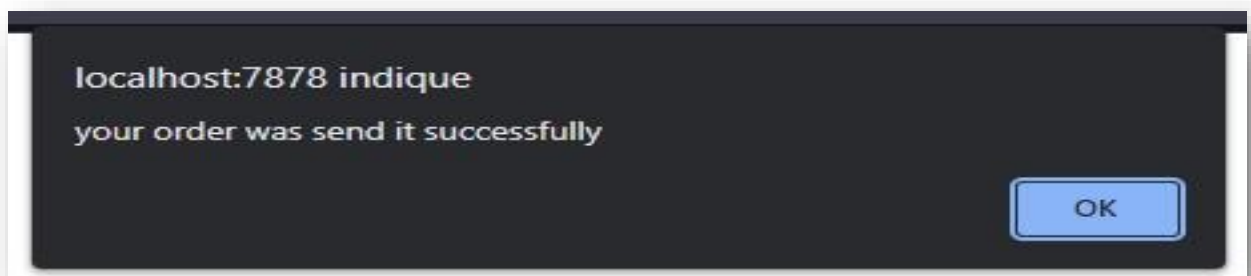


Figure 3.24: PayPal Page

The customer fills in his personal information.


And as soon as the payment process is confirmed. The customer will be notified that the request has been successfully completed.



After that the system takes him to the final page to see the details of his request with the ability to download his order.

**Thank You For Your Visiting !**  
Your commande was send it sucefully !

we will Contact with you by the Phone Number or by Email when the commande finish .



Commande ID : 9G824926JM049744C

Commande Date : 2022-07-08

Commande Methode : by PAYPAL

**From:**  
Electro -Bedri  
Selwan - Nador - Morocco  
Email: electro-bedri@gmail.com  
Phone: +212 60250000

**To :**  
kamalli mhiyeb  
Adresse : Nador , Poblaw  
Email: kamalpatara@gmail.com  
Phone: 0614253669

Product Name	Quantity	Price Details	Total Price
Casque EASO +	1	\$ 190	\$ 190.00
Tablette Educative	1	\$ 150	\$ 150.00
<b>Total</b>			<b>\$ 340.00</b>

download the Commande as a PDF

Figure 3.25: Command Page

## 3.4 Conclusion

This was all about the user and the admin interface. We have made sure to show a great interface design. Taking into account the need to facilitate the user to navigate between pages. Without forgetting the flexibility in the admin page, he can control and monitor all site data.

---

## Conclusion and future works

In this final semester, a full-fledged ecommerce system with different products from different categories for now, waiting for adding real products of our professor workshop and a recommendation system is integrated.

We used user to user collaborative filtering which boost the performance of the system.

The system can highly be improved some of the work for future work is to extend the search features like adding a chat bot to facilitate searching and use different filters to the system. Trending list can be generated based upon the popularity of the product in certain period of time in certain area. To increase the sell, promo code for certain discount must be integrated, selling different kind of products and not just one specific kind for targeting different kind of customer and integrating a new payment methods as well. Password, strength checker can also be integrated for better security.

The option for language can be increased in future to sell more product to the native people of different community. There are many possibilities for the development of the system. Just like other software, this software also has a lot of unseen bug. We will regularly fix and upgrade the software during maintenance and deployment of the system in real life.



---

# Appendix A - Frequently Asked Questions

## Why we Choose this Project Exactly?

When we were looking for a subject for our final project for a bachelor's degree, we found many subjects, but we chose this one exactly. Because we are sure that when we are working on this project will apply most of our gains during the bachelor period as programming tools and languages (Html , CSS , JavaScript , PHP . . . ) and Conceptual study (UML . . . ) . This will enable us to quickly integrate into the labor market

## Why we Use a Website not a Desktop Application?

*Here are a few reasons that make web applications superior:*

- Web apps are accessible anywhere.
- There is no update hassle.
- You do not have to worry about system requirements.
- Web apps cost less.
- They are more cost-efficient.

## Why we Choose PHP as a Main language for our website ?

**PHP** has some advantages that have made it so popular, and it's been the go-to language for web servers for more than 15 years now. Here are some of PHP's benefits:

- Cross-Platform
- Open Source
- Easy to learn:
- PHP syncs with all Databases
- Supportive Community

## What our Database Looks Like?

- MySQL Interface



The screenshot shows the MySQL interface in PhpMyAdmin. On the left, a sidebar lists the database structure: 'Nouvelle base de données', 'information\_schema', 'mysql', 'performance\_schema', 'phpmyadmin', 'productdb', 'Nouvelle table', 'admins', 'category', 'orderproduct', 'orders', 'producthotdeal', 'producttb' (selected), 'review', 'users', 'students', and 'test'. The main panel displays the 'producttb' table with the following SQL query: `SELECT * FROM `producttb` ORDER BY `product_description` ASC`. Below the query, there are options for 'Profilage', 'Éditer en ligne', 'Éditer', 'Expliquer SQL', 'Créer le code source PHP', and 'Actualiser'. A table control bar shows 'Nombre de lignes: 25', a search filter, and a sort dropdown set to 'Aucun(e)'. The table data is as follows:

	productid	product_name	productOldPrice	productNewPrice	product_image	product_category	Qty	product_description	product_rate
<input type="checkbox"/>	5	Casque EA50 +	1000	190	/product05.png	4	24	Razer BlackShark V2 X - Casque De Jeu Esports Pri...	4
<input type="checkbox"/>	3	Sony Xperia Z4	519	419	/product03.png	3	14	16 Go de mémoire RAM DDR4-2933 MHz + Stockage Disq...	5
<input type="checkbox"/>	7	HP E1500	700	100	/product08.png	3	14	16 Go de mémoire RAM DDR4-2933 MHz + Stockage Disq...	0
<input type="checkbox"/>	19	Tablette Éducative	200	150	product04.png	2	18	ANYWAY GO Tablette pour Enfants 10.1 Pouces, Andro...	4
<input type="checkbox"/>	20	Apple MacBook pro 12	20	54	/product06.png	3	6	ANYWAY GO Tablette pour Enfants 10.1 Pouces, Andro...	5
<input type="checkbox"/>	2	Sony E7 Headphones	100	79	/product02.png	4	5	Casque PC Filaire avec Micro New Bee Casque USB/3,...	0
								HUAWEI MateBook D 15 PC	

Figure 3.26: the Database in PhpMyAdmin

---

# References

- [1] Anantha, L. & Bhattula, B. P., 2017. A REVIEW ON RECOMMENDATION SYSTEM USING RATING DATASET. *International Journal of Pure and Applied Mathematics*, 116(5), pp. 133-135.
- [2] Chnag, S., Harper, F. M. & Terveen, L., n.d. *Crowd-Based Personalized Natural Language Explanation for recommendation*, Minnesota: The GroupLens Center for Social and Human-Centered Computing.
- [3] HERLOCKER, J., KONSTAN, J., TERVEEN, L. & RIEDL, J., 2004. Evaluating Collaborative Filtering Recommender systems. *ACM Transactions on Information System*, 22(1), pp. 5-10.
- [4] Kang, J. et al., 2017. *Understanding How People Use Natural Language to Ask for Recommendations*, s.l.: University of Minnesota.
- [5] Ricci, F., Rokach, L., Shapira, B. & Kantor, P. B., 2011. *Recommender Systems Handbook*. Springer New York Dordrecht Heidelberg London: Springer.
- [6] Sitikhu, P., Pahi, K., Thapa, P. & shakya, s., 2019. *A Comparison of Semantic Similarity Methods for Maximum Human Interpretability*, Pulchowk Lalitpur: Pulchowk Campus, IOE, Nepal.
- [7] CHEN, Xi, LIU, Ming, et GILSON, Michael K. BindingDB: a web-accessible molecular recognition database. *Combinatorial chemistry ' & ' high throughput screening*, 2001, vol. 4, no 8, p. 719725.[Viewed at:5/01/2021]
- [8] statista, 2020. eCommerce. [Online] Available at:  
<https://www.statista.com/outlook/243/100/e-commerce/worldwide#marketglobalRevenue>  
e [Accessed 20 5 2020].