

COMP2121: E-Business

Group 7 Project: EcoCOMP Report

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1.Executive Summary

In this report, we will introduce the whole procedure to build the e-commerce website for our startup **EcoCOMP**. The development workflow includes general planning, webpage designing, and website developing. We will first introduce our company backgrounds and business models, then we will illustrate the use cases and functionalities of our website. After that, the basic functions and advanced functions of the websites will be presented. Last but not least, we will give a brief discussion and propose some future development suggestions.

2.URLs of Our Websites

Here are the links to our website. You can create new accounts yourself. We also prepared an admin account for you to test the admin functions:

Account: admin@comp.polyu.edu.hk

Password: admin123456

www2.comp.polyu.edu.hk/~18085481d/EcoCOMP

www2.comp.polyu.edu.hk/~18080662d/EcoCOMP

www2.comp.polyu.edu.hk/~18081569d/EcoCOMP

www2.comp.polyu.edu.hk/~18081698d/EcoCOMP

3.Company Background

Nowadays, environmental protection has become a concept pursued by more and more people. Some influential companies such as Apple also launched many eco-friendly products in recent years. Our company, **EcoCOMP**, is a startup mainly focusing on producing and selling eco-friendly computer accessories, such as keyboards, earphones, sounds and mouses. We try to make our products as environmentally friendly as possible and have already received many faithful customers. We now want to enlarge the market and use the website for the convenience of customers' purchasing process.

4. Business Model

4.1 Value Proposition

Our products are green and **environmentally friendly recyclable** computer accessories products. Our EcoCOMP company pursues the concept of green economy and strives to be green and environmentally friendly in terms of products.

4.2 Target Users

The target customer groups are young and middle-aged groups who care for their health and care about the environment. We will attract them with high-quality products and the concept of **environmental protection** and pollution-free.

4.3 Sales and Marketing

We can use the **old-for-new**(in-trade) promotion to give consumers the desire to consume. We also support users to trade in second-hand items. On the one hand, we can obtain low-cost products, on the other hand, we can also avoid the waste of resources. This activity can also increase consumer stickiness and make them more likely to buy our products.

4.4 Production

The products we process are also completely green and environmentally friendly. The materials we choose are **wood, glass and metal** as much as possible. Their common feature is that they are recyclable, and no toxic and harmful substances are produced in the natural state.

4.5 Distribution

We have **our own sales website**, so there is no need to provide profits to other distributors. Later, when gradually expanding, we can consider setting up offline physical stores to experience our products for users.

4.6 Income Model

We use low-cost recycled raw materials or second-hand products to make items. This saves costs on the one hand and uses waste on the other, making it more environmentally friendly. We make a profit by selling our products at a price increase. We **buy low and sell high**.

4.7 Cost Structure

Our main cost is the source of raw materials. Since our raw materials are **recycled second-hand materials**, the cost will be very low. We will place some advertisements on environmental protection-related networks. Every time an item is sold, 1% of the profits will be donated to the Environmental Protection Association. This will make consumers feel like they are doing charity when buying and will increase consumer interest in buying. It can also expand our visibility and use advertising money for public welfare.

4.8 Competition

In this market, it is still a blue ocean. Brands for green and environmentally friendly computer peripherals are very limited on Amazon and Taobao, with only about five. We have huge development potential.

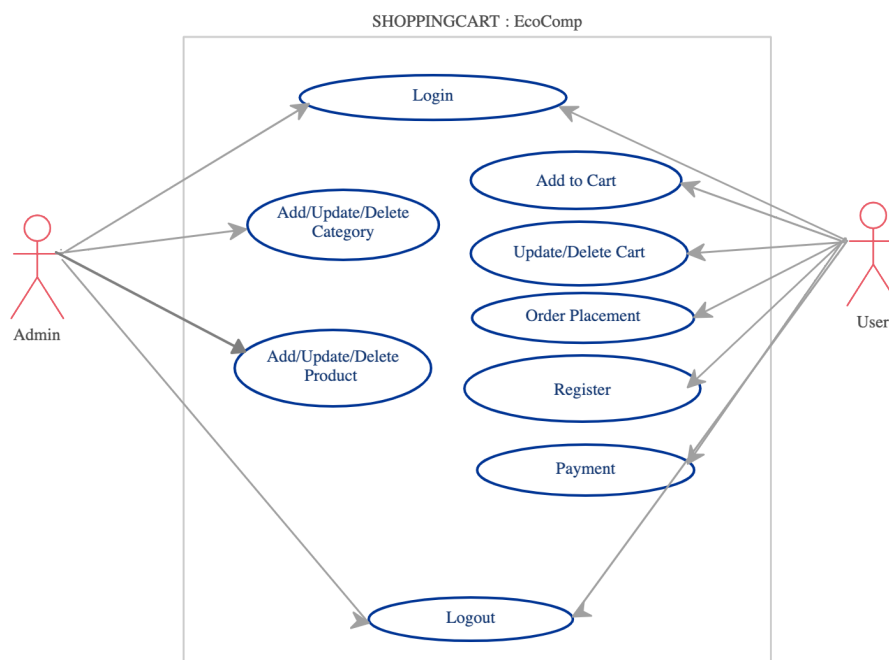
4.9 Market Size and Growth

In this market, it is still a blue ocean. The market size is **huge** for all the people who buy computer peripherals are all our future customers. With the improvement of environmental protection awareness, everyone will like to use pollution-free computer peripherals. We will expand with the dividends of the times. At the 13th Five-Year Conference, the government advocated the development of an environmentally friendly economy. With the help of the government, we will expand our market quickly.

5. Use Cases and Functionalities

5.1. Use Case Diagram

To better illustrate the functions of our website, we draw this use case diagram. Here it is easy to find that the two actors in this diagram are customers and admins. They are the main users of this website. Users can add products, delete the products, clear the shopping cart, register a new account and modify the information. The admins are users with root authority. They can modify the products and manage the orders.



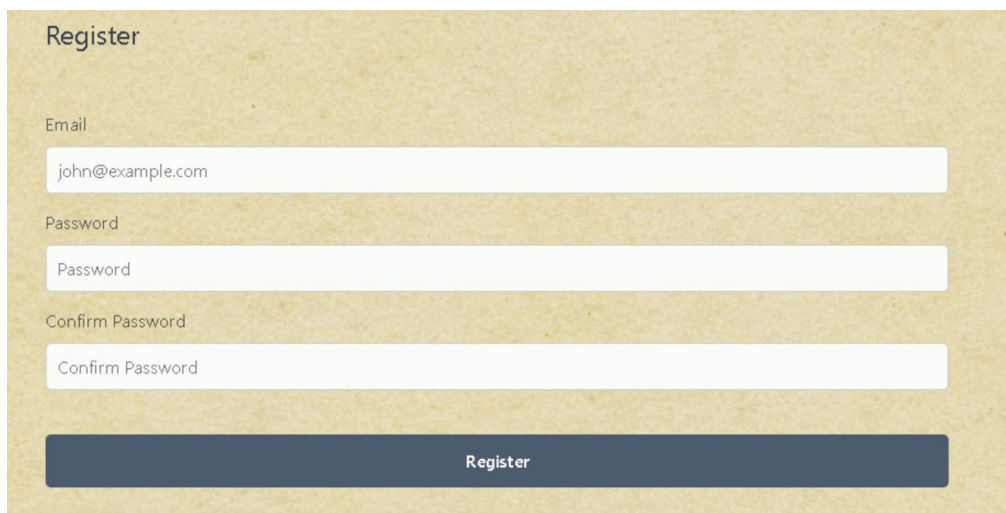
5.2. Implementing All General Requirements

Part 1: Account Management System

We developed the account system which allows the users to log in, log out, forget passwords, reset passwords and modify personal information. The following is the screenshot of these functions.

Registration

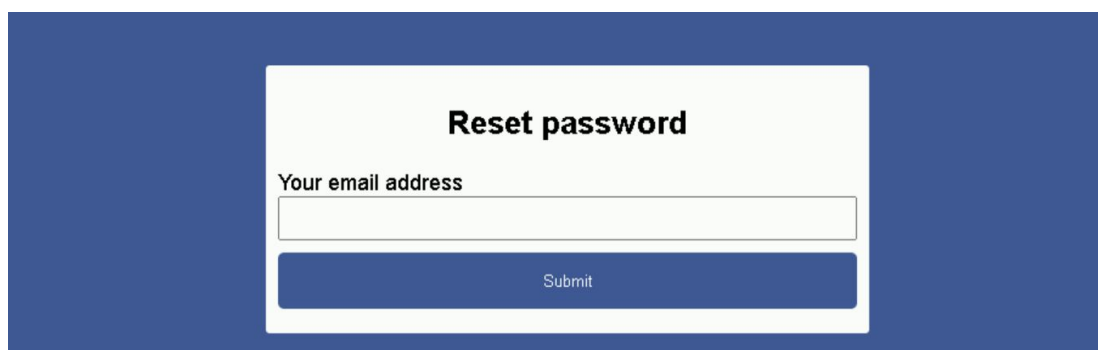
New users can register using their email account. After the registration, they will receive a confirmation email.



A screenshot of a registration form titled "Register" on a light brown background. The form contains three input fields: "Email" with the value "john@example.com", "Password" with the placeholder "Password", and "Confirm Password" with the placeholder "Confirm Password". Below these fields is a dark blue button labeled "Register".

Login / Forget Password

Users may forget their password. So we developed the forget password function. Users can input their email to receive an email which allows them to reset the password. **Notice that during our testing, we find that this takes about several minutes to send the email.**




A screenshot of a "Reset password" form on a dark blue background. The form is a white box with the title "Reset password" in bold. Below the title is a label "Your email address" followed by an empty input field. At the bottom of the form is a dark blue button labeled "Submit".

View / Update Personal Information

The system allows users to change their personal information. Currently, it supports changing the address and account email. Also, users can reset their password here. Noticed that the reset password function is different from the previous forget password function. Here the user can directly change the password without email verification.

My Profile



User name: Caiqi ZHANG
Email: admin@comp.polyu.edu.hk
Reset Password
Address: HK PolyU room 445 Hong Kong HK PolyU 000000 China

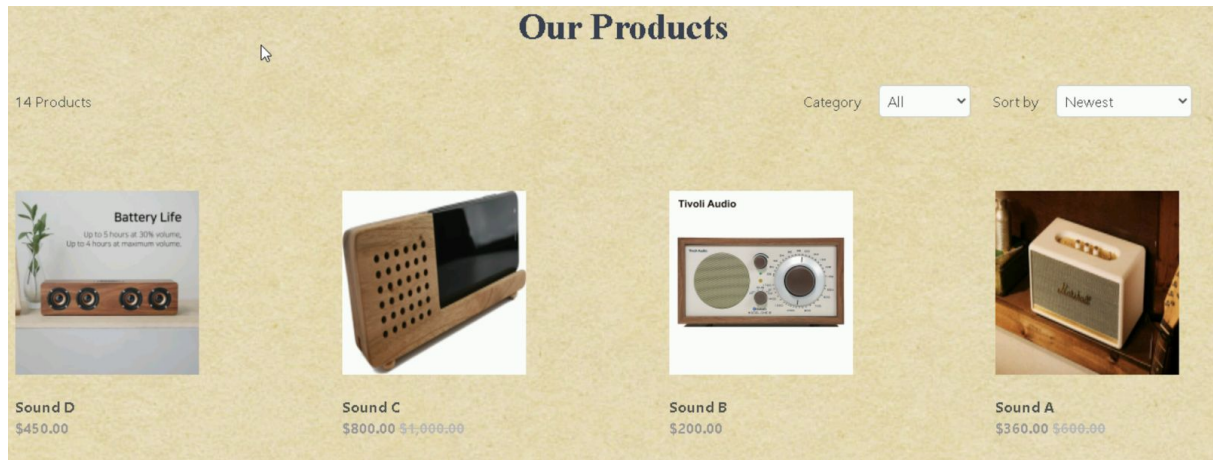
Update Address

Update Email

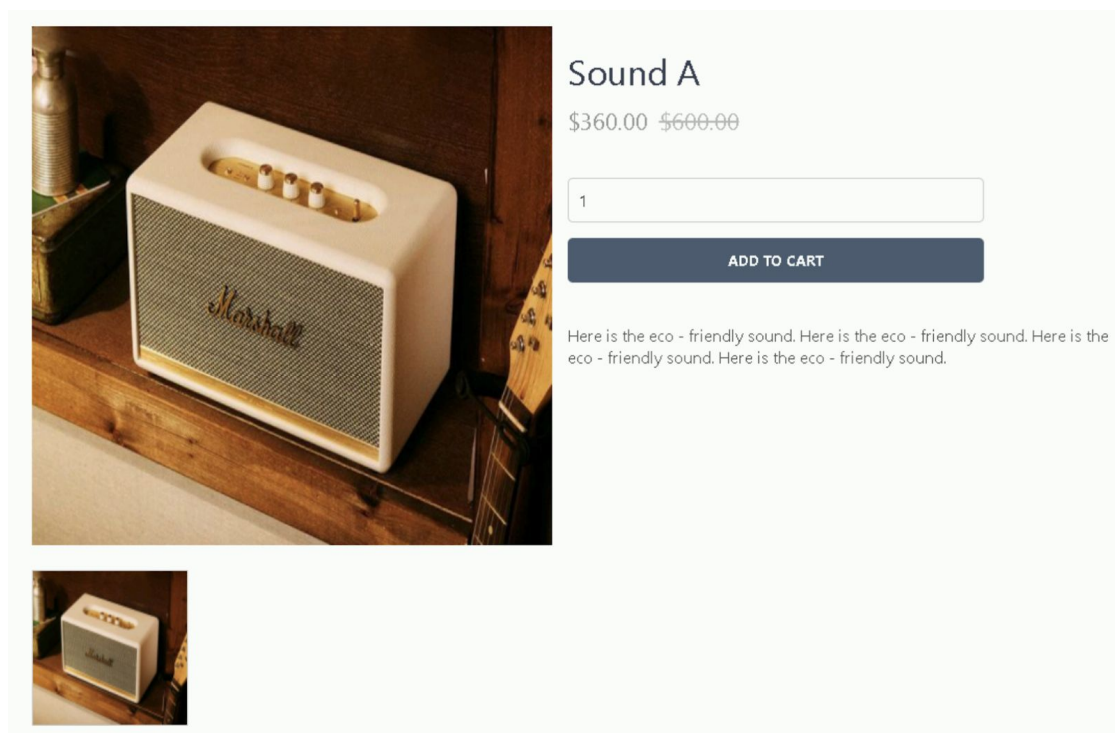
Part 2: Shopping Process System

Items Display

We divide the items display part into two pages, which are the **Home** page and **Our Product** page. The purpose is to make our hot-selling products on the **Home** page to attract the customers. In **Our Product** page, the users can see all the items. They can also sort the items in Alphabetical A-Z, Alphabetical Z-A, from Newest to the Oldest, and from the Oldest to the Newest. Meanwhile, they can also choose the categories, such as Earphones, Sounds, and keyboards.




After clicking into the item, users can see the details of the product with the pictures and description. Here the description is only for a demo. Clicking “ADD TO CART” will add the user’s input number of products to the shopping cart. The system will check whether there are still available products.



Shopping Cart

The users can select multiple items to a shopping cart. They can also modify the number of products in the shopping cart. After changing the number of products, they need to click the “Update” to see the new amount of money. If they decide to pay, they can click “Checkout” and go to the payment page.

Shopping Cart

| Product | Price | Quantity | Total |
|---|----------|----------|----------|
|  <div>Sound A Remove</div> | \$360.00 | 1 | \$360.00 |

Shipping Method

☒ Standard
 ☐ International

Subtotal

\$360.00

Shipping

\$7.99

Total

\$367.99

Empty Cart

Update

Checkout

Shopping History

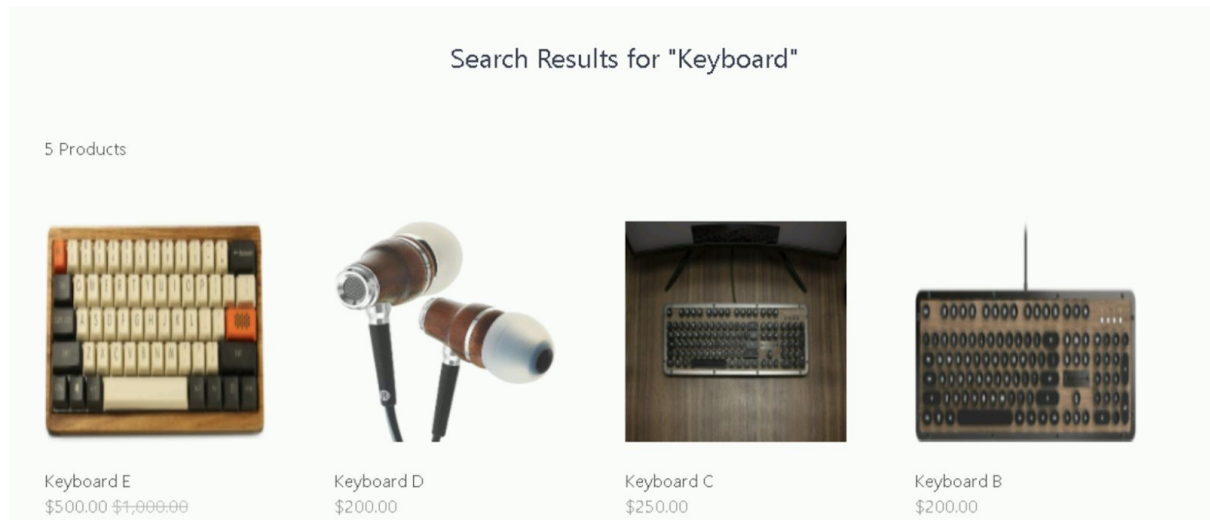
My Orders

| Product | Quantity | Total |
|--|----------|------------|
|  <div>Sound D</div> | 3 | \$1,373.97 |

5.3 Additional Innovative Functions for Bonus

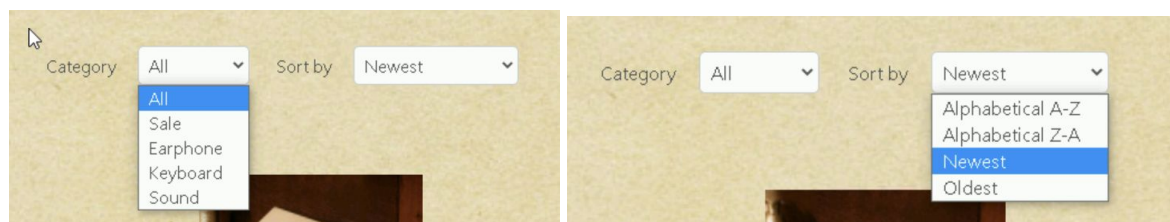
Search Engine

For the convenience of the customers, we develop the search engine function. The search engine function can filter the items using keywords. Here is an example of searching “Keyboard”.



Filter and Sort

As mentioned previously, users can also sort the items in Alphabetical A-Z, Alphabetical Z-A, from Newest to the Oldest, and from the Oldest to the Newest. Meanwhile, they can also choose the categories, such as Earphones, Sounds, and keyboards.



Admin

For the convenience of the admins to manage the system, we add the management system for the website. The admins can see the orders here to check the money and deliver goods more conveniently. Meanwhile, the admins can also use the system to add products and add more categories. More functions can be developed in the future.

Shopping Cart Admin


Orders

Products

Categories

Log Out

Orders

| Product | Date | Price | Quantity | Total |
|---|-------------------|----------|----------|------------|
| <div><div></div><div>Sound D</div></div> | December 13, 2020 | \$450.00 | 3 | \$1,350.00 |

| | | | | | |
|--|----------------|------------|----------|----------|----------|
| <div>Orders</div> <div>Products</div> <div>Categories</div> <div>Log Out</div> | Products | | | | |
| | Create Product | | | | |
| | # | Name | Price | RRP | Quantity |
| | 7 | Earphone A | \$100.00 | \$199.00 | 100 |
| | 8 | Earphone B | \$200.00 | \$300.00 | 100 |
| | 9 | Earphone C | \$200.00 | \$300.00 | 198 |
| | 10 | Earphone D | \$200.00 | \$600.00 | -1 |
| | | | | | Images |

Fantastic animation

On our website, there is some animation when clicking and mouse moving happens, which makes interactions between customers and the website become better.

6. Discussion Including the Future Development Plan

- 1) **More practical payment part:** Now the website's payment method is only by email and users can check their orders by their email box. However, in real commercial circumstances, the platform must use some trustable, efficient and common payment method, such as Paypal, Stripe or Alipay. For further development, we can add more modules about payment.
- 2) **Tax and shipping:** Of late, our project mainly focuses on the payment itself. Nevertheless, we also need to consider tax and shipping. The commercial society should be able to calculate the tax and shipping fees for customers and sellers. The project should try to form a better formulation of shipping and taxing.
- 3) **Portable website or app:** Most commercial websites have their unique version on phone, it might be a website or Application. For instance, Taobao has its app developed on cell phones, so that customers can buy their favourite goods conveniently by the app. Our website can also focus on portable implementation to earn more revenue.
- 4) **Advertisement:** Some websites have advertisements for other websites. It is an efficient way to achieve additional income

7. Program Structure

7.1 Overview:

The website is developed in pure HTML5, CSS, JavaScript and PHP without any other external Front-end framework. The program structure is as follows.

7.2 User Page

To define the basic information, the program uses the ***config.php*** to hold this information, like a database server or email address. The ***functions.php*** provides fundamental functions like database connection, footer creator and email template.

The user part is mainly developed under the file: ***index.php***. In the index, the website can be directed to ***myaccount.php*** that can help register new users or login in existing users. Once the user login or register, the session will remember it redirect users to their own page, which stores their basic information such as email, address and purchasing history. The file ***myaccount_logic.php*** will query the database and handle the information.

Apart from the accounting system, the index page will cover the home page and products page of the website. The ***home.php*** will be directly directed to from the index when the user visits the website for the first time. It displays the newest four products updated by admin. The ***products.php*** shows all the products of the website, it queries the database and displays them. In order to support searching and sorting function, program user ***search.php*** to support the advanced functionality in this page. When we click the items displayed on the products, they will be directed to file ***product.php***. They can watch the basic information and choose to add this to their cart. The file uses a session to store the cart information.

After choosing favourite goods, users can check them in ***cart.php***. It will display the cart's information stored in the session and provide basic modification functions. To support these functions, we offer ***cart_logic.php*** as a backend to fulfil these requirements and logic design.

Eventually, users can check out when they finish modification. In this page, they are required to enter basic information to finish purchasing. After purchasing, this file will send an email and store the transaction data to the database. We use ***checkout.php*** to implement these requirements.

For basic art design, we use CSS and javascript. ***main.css*** and ***style.css*** stores colour and style design. ***script.js*** stores basic animation of buttons or links.

7.3 Admin Page

Admin part also uses `config.php` and `functions.php` to provide fundamental data. The index page is the home page of the admin. Administrators can look up the orders of the website through the **`orders.php`** which queries the database and displays them by time.

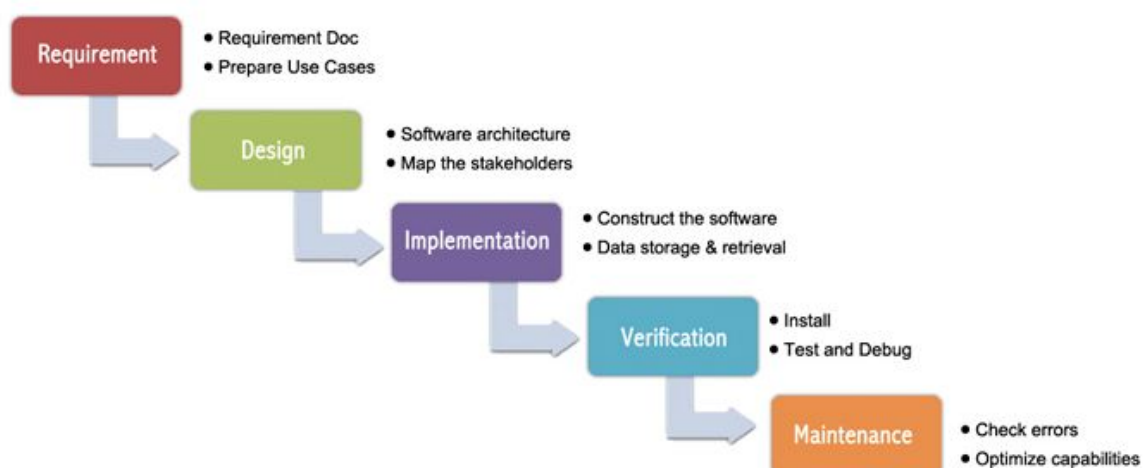
Administrators can monitor the category in **`categories.php`**, which holds the tag for the products. For instance, the keyboard products will be provided with the tag “Keyboard”. If new categories are needed, administrators can add them to the database by **`category.php`**.

The administrator can modify the information of products. They can overview the list of products in file **`products.php`**, which provides basic information of all the products. If the one to add, insert and modify the products, they can use file **`product.php`** to finish these transactions toward the database.

8. Development Strategy

8.1 Overview of Development Strategy

We use the waterfall model to develop the project. Since our requirement is determined clearly and hardly changed over the development period. To minimize cooperation cost and maximize developing speed, the waterfall model is a possible choice. The advantages also include that it is easy to plan and management, and it is easy for tracing responsibility.



Waterfall model

8.2 Requirement Analysis and Definition

The significant mission of the website is the implementation of the accounting system: login, register and modification and shopping cart system: item display, cart operation and checkout. The detailed requirements are in Section 5.

8.3 System and Software Design

The system is based on two parts, frontend and backend. The frontend will display the information and handle the actions of the agent. While the backend will analyze the action and response to it, revealed by, such as database operation, email sending and session. The design of the software is parted into two parts, i.e. user and admin has been detailedly described in program structure.

8.4 Implementation

We use PHP to implement the link towards persistent data and website outlook. To begin, the database contains accounts and products will be settled. Then use PHP and basic HTML to implement the accounting system. Based on this part, the shopping cart can be developed. After all the backend is finished, the frontend will be furnished, at the last part. After developing the user part, the admin part will be developed as a similar procedure, as the user, to finish the project.

8.5 Testing

To eliminate as many bugs as we can, our team has deeply tested the website. We divide the testing work into three stages: **Component testing**: to test all the functions. **System testing**: to test the system as a whole and mainly focus on the use cases and flow of the website. **Acceptance testing**: we also invite some of our friends to act like customers to check whether the system meets the customers' needs. The component testing includes the following.

1. Login / Logout / Register
2. Reset password, address / Forgot password and email response
3. Sort / Filter / Search
4. Cart modification / Checkout and email response
5. Administrator's function test and user part's reaction
6. Error detection, the wrong password, existing email address, out of item number.

8.6 Maintenance

Our website does currently not reach this stage. However, in the future, our team will be responsible for the maintenance of the website.

9. Contributions of Team Members

FAN Junqiao: Account system, video editing, and report.

LI Jinlin: Shopping cart, management system, and report.

WANG Hewei: Website front end design, personal profile, and report.

ZHANG Caiqi: Additional functions and report.

References:

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- [2] <https://www.cleart.com/php-and-mysql-web-development.html>
- [3] <http://publications.lib.chalmers.se/records/fulltext/149235.pdf>
- [4] <https://codeshack.io/shopping-cart-system-php-mysql/>
- [5] <https://patentimages.storage.googleapis.com/de/d8/55/ef32ab7331d6ce/US20160259509A1.pdf>
- [6] <https://baike.baidu.com/item/%E5%95%86%E4%B8%9A%E6%A8%A1%E5%BC%8F>
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