EASTERN INTERNATIONAL UNIVERSITY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF SOFTWARE ENGINEERING

PROJECT 2 REPORT

Tphones Shop Website

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Binh Duong, December 2023

ABSTRACT

The project aims to create a website for the purpose of selling mobile phones to customers. The website will provide a user-friendly interface where customers can browse and select from a variety of mobile phone models, view detailed specifications and prices, and make secure online transactions for purchasing their desired phone. It will be designed to cater to the needs and preferences of different customers by offering a wide range of brands, models, and price ranges. The project will leverage the potential of e-commerce to provide a convenient and efficient platform for customers to purchase mobile phones from the comfort of their own homes. Through comprehensive marketing strategies and effective customer service, the website aims to attract and retain a large customer base and ultimately establish itself as a reliable and trustworthy online platform for purchasing mobile phones.

ACKNOWLEDGEMENT

I would like to express my deepest appreciation to all those who provided me the opportunity and guidance. First and foremost, I thank to my parents for giving me life. A special gratitude I give to our university – Eastern International University, especially Department of Software Engineering of School of Computing and Information Technology giving me the chance to carry out my projects and accumulate valuable experiences. Most importantly, I would also like to show my special thanks to my supervisor, Ung Văn Giàu, who in spite of his duties, got time to listen, guide and keep me on the correct path. I would like to acknowledge with much appreciation the important role of myself for my dedicated involvement and enthusiastic attribution during doing this project.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

No.	Abbreviations	Definition
1	HTML	Hypertext Markup Language
2	CSS	Cascading Style Sheets
3	JS	JavaScript
4	JPA	Java Persistence API
5	SQL	Structured Query Language

CHAPTER 1. INTRODUCTION

1.1. Motivation

The motivation behind the development of this e-commerce website project stems from the increasing demand and popularity of smartphones in the market. With the advent of technology, smartphones have become an essential part of our daily lives, serving not just as a means of communication but also as a tool for entertainment, productivity, and connectivity. Recognizing this growing trend, this project was created with the aim of providing a platform where individuals can easily access and purchase the latest and most sought-after phones from renowned brands. By offering a wide range of options, timely updates on new releases, competitive prices, and user-friendly features, this project aims to cater to the needs of tech-savvy consumers who prioritize convenience and quality when making their phone purchasing decisions. The ultimate motivation is to establish this project as a trusted and reliable online destination for individuals seeking to upgrade their mobile devices.

1.2. Objectives

The primary goal of developing this e-commerce website project is to create a seamless and convenient platform for customers to explore, select, purchase, and receive smartphones online. The website serves as a strategic tool for businesses to expand their reach, enhance customer accessibility, and consequently, increase sales and revenue. By offering a user-friendly interface that operates seamlessly on both mobile and desktop devices, the platform ensures accessibility for customers at any time and from any location, thereby providing a high level of convenience. Additionally, the inclusion of features such as user, product, brand, and order management, along with a customer feedback system, ensures efficient control and responsiveness to user interactions. The integration of a purchase history section adds an extra layer of utility, providing users with a unique and valuable feature not commonly found on all e-commerce websites. Through effective digital marketing strategies, the website aims to establish a strong online presence, boosting brand visibility and attracting a larger audience. In essence, the development of this e-commerce project seeks to create a holistic and effective online marketplace for smartphones, fostering brand awareness, customer engagement, and streamlined transactions.

1.3. Project Overview

Tphones website is a website developed by using HTML, CSS, JS and Bootstrap framework for front-end. With the back-end of this website I use Spring Boot Framework and Thymeleaf. In more details, Spring Boot is a popular framework for building Java-based backend applications. It simplifies the process of creating, configuring, and deploying standalone Spring applications by providing a convention-over-configuration approach. Thymeleaf is a Java-based templating engine for server-side rendering in web applications. It is designed to work seamlessly with Spring Framework and provides a natural way to render server-side views with HTML5 and CSS3. In addition, Bootstrap is a popular open-source front-end framework that helps in designing and developing responsive and mobile-first websites. It focuses on the user interface (UI) aspect of a website, providing ready-to-use components and styles to enhance the overall look and feel.

1.4. Project Organization

- Chapter 1: Introduce motivation, objectives, and project overview
- Chapter 2: Introduce some techniques that play a vital role in my project.
- Chapter 3: Analysis, Design and Implementation
- Chapter 4: Result and Discussion
- Chapter 5: Conclusion and Future Work

CHAPTER 2. TECHNOLOGIES

2.1. Spring Boot

2.1.1. Spring Boot introduction

Spring Boot is an open source Java-based framework used to create a micro Service. It is developed by Pivotal Team and is used to build stand-alone and production ready spring applications. This chapter will give you an introduction to Spring Boot and familiarizes you with its basic concepts.

Spring Boot provides a good platform for Java developers to develop a stand-alone and production-grade spring application that you can just run. You can get started with minimum configurations without the need for an entire Spring configuration setup. [1]

2.1.2. Advantages of Spring Boot

- It provides a flexible way to configure Java Beans, XML configurations, and Database Transactions.
- It provides a powerful batch processing and manages REST endpoints.
- In Spring Boot, everything is auto configured; no manual configurations are needed.
- It offers annotation-based spring application.
- Eases dependency management.
- It includes Embedded Servlet Container. [1]

2.2. Thymeleaf

2.2.1. Thymeleaf introduction

Thymeleaf is a Java library. It is an XML/XHTML/HTML5 template engine able to apply a set of transformations to template files in order to display data and/or text produced by your applications.

It is better suited for serving XHTML/HTML5 in web applications, but it can process any XML file, be it in web or in standalone applications.

The main goal of Thymeleaf is to provide an elegant and well-formed way of creating templates. In order to achieve this, it is based on XML tags and attributes that define the execution of predefined logic on the DOM (Document Object Model), instead of explicitly writing that logic as code inside the template.

Its architecture allows a fast processing of templates, relying on intelligent caching of parsed files in order to use the least possible amount of I/O operations during execution.

And last but not least, Thymeleaf has been designed from the beginning with XML and Web standards in mind, allowing you to create fully validating templates if that is a need for you. [2]

2.2.2. Advantages of Thymeleaf

JSP is more or less similar to HTML. But it is not completely compatible with HTML like Thymeleaf. We can open and display a Thymeleaf template file normally in the browser while the JSP file does not.

Thymeleaf supports variable expressions (${...}) like Spring EL and executes on model attributes, asterisk expressions (*{...}) execute on the form backing bean, hash expressions (#{...}) are for internationalization, and link expressions (@{...}) rewrite URLs.

Like JSP, Thymeleaf works well for Rich HTML emails. [2]

2.3. MySQL

2.3.1. MySQL introduction

MySQL is an open-source, relational database management system (RDBMS) that is ideal for both small and large applications. It is very fast, reliable, scalable, easy to use, cross-platform, and compliant with the ANSI SQL standard. It was first released in 1995 and is developed, distributed, and supported by Oracle Corporation. It is named after co-founder Monty Widenius's daughter: My. [3]

2.3.2. Advantages of MySQL

a) Open-source and compatible

This simply means that anyone can install and use the basic software, while also enabling third parties to modify and customize the source code. More advanced versions, which offer additional capacity, tools and services, come with tiered pricing plans.

MySQL is also built to be highly compatible with a wide range of systems, programming languages and database models. This includes alternative DBMS solutions, SQL and NoSQL databases and cloud databases. MySQL also has extensive capabilities for database design and data modeling (e.g. conceptual data models or logical data models). This makes it a simple and practical option for many organizations, while reducing fears of being 'locked in' to the system. [4]

b) Fast and reliable

MySQL was developed for speed, even if this may come at the expense of some additional features. It is also known for its reliability as a database administrator, backed by a large community of programmers that have put the code through tough testing. Another benefit is that it is relatively simple to learn and use. And as it has been around for nearly three decades, it's not hard to find experienced MySQL developers when you need them. [4]

c) Availability

Online businesses and web platforms need to be able to provide round-the-clock services for a global audience. This is why high availability is a core feature of MySQL. It uses a range of cluster servers and data replication configurations that ensure uninterrupted uptime even if there is a failure. MySQL also uses a variety of backup and recovery strategies to ensure data is not lost in the event of a system crash or unintentional delete. [4]

d) Scalability

As data volumes and user loads increase, the database store needs to be scaled-up. It must be able to cope with the additional workload without a drop in performance. MySQL can be scaled in different ways, typically via replication, clustering or sharding (or a combination of them). It is able to support and process very large databases, though this is likely to have an impact on speed. [4]

e) Security

This is always an important consideration for businesses as they need to protect sensitive data and defend against cyberattacks. MySQL offers encryption using the Secure Sockets Layer (SSL) protocol, data masking, authentication plugins, and other layers of security to protect data integrity. The MySQL Enterprise package also includes firewall protection against cyberattacks. [4]

2.4. Bootstrap

2.4.1. Bootstrap introduction

- Bootstrap is a free front-end framework for faster and easier web development.
- Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins.
- Bootstrap also gives you the ability to easily create responsive designs. [5]

2.4.2. Advantages of Bootstrap

a) Time-Saving

When you are bound to an extremely confined timeline to build a website, web app or mobile app, you can take advantage of Bootstrap and nail your project effortlessly. It’s because of the ready-made blocks built ready for you to use them. Clearly, you don’t have to start everything from scratch, and you can modify certain elements to make it unique with your inputs.

Also, Bootstrap unpacks ready-made themes & templates when you download and install it. You can choose from it or you can also opt to include inputs from other sources. But, you must also be aware that there are a lot of people who do the same. Hence, to look unique from the rest of the websites that have the same theme or template, you need to get a little creative and tweak certain things so that it defines your website or application distinctively. [6]

b) Easy to Use

No matter whether you are an expert or a beginner in web technologies, you can swiftly do the Bootstrap installation for yourself without any hassle. As said, though you don't have to be an expert in web technologies (HTML, CSS, JavaScript), having basic knowledge of them don't hurt. Below are the ways to link your HTML document with your style sheet and script file. [6]

c) Responsive Grid System

Creating a page starts from creating a grid layout for your page. Responsive grid systems are of utmost priority as there is an increase in the usage of smartphones. Any disorientation in front-end design will directly impact on the authenticity of the website and your website fails to gain the visitors' trust. Since Bootstrap has been built under the idea of "Mobile-First", its grid system can divide the screen into 12 equal columns and accommodate the elements according to the screen size. This makes your website's front-end mobile-friendly. Also, with the help of the grid system's classes, you can hide and show certain elements only on certain devices. [6]

d) Customizable

You can always tweak the CSS file if you're not satisfied with Bootstrap's design template. Also, you can combine it with your existing design and make them complement each other's functions. It is very much helpful when you want to give your website a distinct look but you don't have enough time to learn or code custom CSS from scratch.

With the help of Bootstrap's customization page, you can tweak it further to create your own theme. Also, you must identify and remove all the plugins and components that you will not require for your web project. Moreover, you also get to have a section where you can customize your template by changing the values to the variables. [6]

e) Cross-Browser Compatibility

The Bootstrap team ensures the compatibility of the framework with all modern browsers versions and platforms. Also, the team claims that they don't support proxy browsers and older browsers, but that doesn't affect its display or functionality. [6]

f) Establish Consistency

For a longer period, there have been inconsistencies prevailing between the Front-end and Backend development teams. The creators of Bootstrap wanted to find a solution to establish consistency among them. Thus, they came up with Bootstrap that eradicates the use of libraries that differ from developer to developer. Hence, no matter who handles the project, the framework establishes consistency throughout the project. Since it is also cross-browser compatible, no matter what browser you use for your development purpose, it consistently reflects the same output across all browsers. [6]

g) Open-Source

Since Bootstrap is an open-source framework, you can modify according to your project demands without having to spend a dime on licenses. Also, it encourages the fellow community developers to contribute so that it can grow at a steady pace. [6]

h) Huge Number of Resources and Community Support

Bootstrap offers a lot of resources on their official website and some other websites also offer certain resources that would ease the front-end development process. Also, the official website offers incredible documentation with which creating a website has never been easier. Moreover, you get access to their templates and themes to which you can make changes.

You can also search for resources offered by websites other than Bootstrap, and you can find UI Kits, tutorials, themes, plugins, templates, etc. for inspiration. You can then use them on projects that demand their presence. Since the Bootstrap community is big, if you are stuck with an error and you couldn’t figure out why it went wrong using Google, you can post a question. Expert developers who walked your path will definitely lend a hand to help you out.

Bootstrap updates their framework continuously and keeps the community posted. Also, the developers keep the community posted by providing informational content regarding the updates and its growth through Bootstrap’s official blog. As a result, it encourages its audience (developers) to give feedback, and the team gets direct tangible feedback from its user base. [6]

2.5. DataTables

2.5.1. DataTable introduction

DataTables is a powerful Javascript library for adding interaction features to HTML tables, and while simplicity is a core design principle for the project as a whole, it can be quite daunting to get started. In this article I’ll introduce the basic concepts that you will need to know to get going with DataTables, and you will find that in a very short space of time you’ll be able to create advanced table controls, tuned to your specific requirements. [7]

2.5.2. Advantages of DataTable

It is easy to use. DataTables is a well-documented library with a large community of users and developers. There are many tutorials and examples available online, making it easy to get started.

It is versatile. DataTables can be used to display data from a variety of sources, including databases, JSON files, and web services. It can also be used to create tables with complex layouts and features.

It is extensible. DataTables is highly customizable, and you can add your own features and functionality. There are also many plugins available that extend the functionality of DataTables.

It is performant. DataTables is designed to be efficient, even with large datasets. It can be used to create tables that are responsive and load quickly.

2.6. Rich Text Field

2.6.1. Rich Text Field introduction

A rich text field is an input field for formatting or applying text styles, such as bold, colors, font sizes, italics, underline, and other visual modifications. Rich text fields and rich text elements are available in Webflow, offering a user-friendly way to organize and stylize content.

For example, users on a blogging platform may want to highlight particular sections of their posts, such as headings or key points. A rich text field allows them to bold, underline, and apply other styles, enhancing readability without learning HTML or CSS. Rich text fields also support features such as links to other webpages, images, inline media such as videos, and lists, allowing users to create engaging content with minimal technical expertise.

However, rich text fields differ from Rich Text Format (RTF), a file format for text files with basic formatting. An RTF file differs from a rich text field in a CMS or online editor. RTF files preserve text styling and formatting when shared between applications, such as word processing programs. [8]

2.6.2. Advantages of Rich Text

Formatting Options: Rich text fields provide a wide range of formatting options, including font styles, sizes, colors, alignment, bullet points, and numbered lists. This allows users to create visually appealing and well-structured content.

Hyperlink Support: Rich text fields enable the inclusion of hyperlinks, allowing users to insert clickable links to external resources, internal documents, or web pages.

Enhanced Communication: With rich text formatting, users can emphasize important points, highlight key information, or use different styles to convey meaning effectively. [9]

CHAPTER 3. ANALYSIS, DESIGN, IMPLEMENTATION

3.1. Project requirements

- Tphones Website is developed by Spring Boot and Thymeleaf for back-end, combined with CSS, JS, jQuery, Bootstrap, DataTable for front-end and MySQL is used to designed database. In our system, there are three primary group features (visitors, customers and managers / administrators).
- The following features for all users:
    - Login and Logout.
    - Register a new account.
    - Search products.
    - View product details.
- The following features for customers:
    - Add products to cart.
    - Buy orders.
    - Send contact.
    - View, edit personal information.
    - View history order(s).
    - Reset / Change password.
- The administrators have access to all customer features and additional functionalities:
    - User account management (add, edit, disable and enable user account(s))
    - Product management (add, update, delete, show product(s) detail)
    - Brand management (add, update, delete, show brand(s) detail)
    - Order management (update status and cancel order(s))
    - Contact management (process contact(s))

3.2. Database Design

3.2.1. ER Diagram

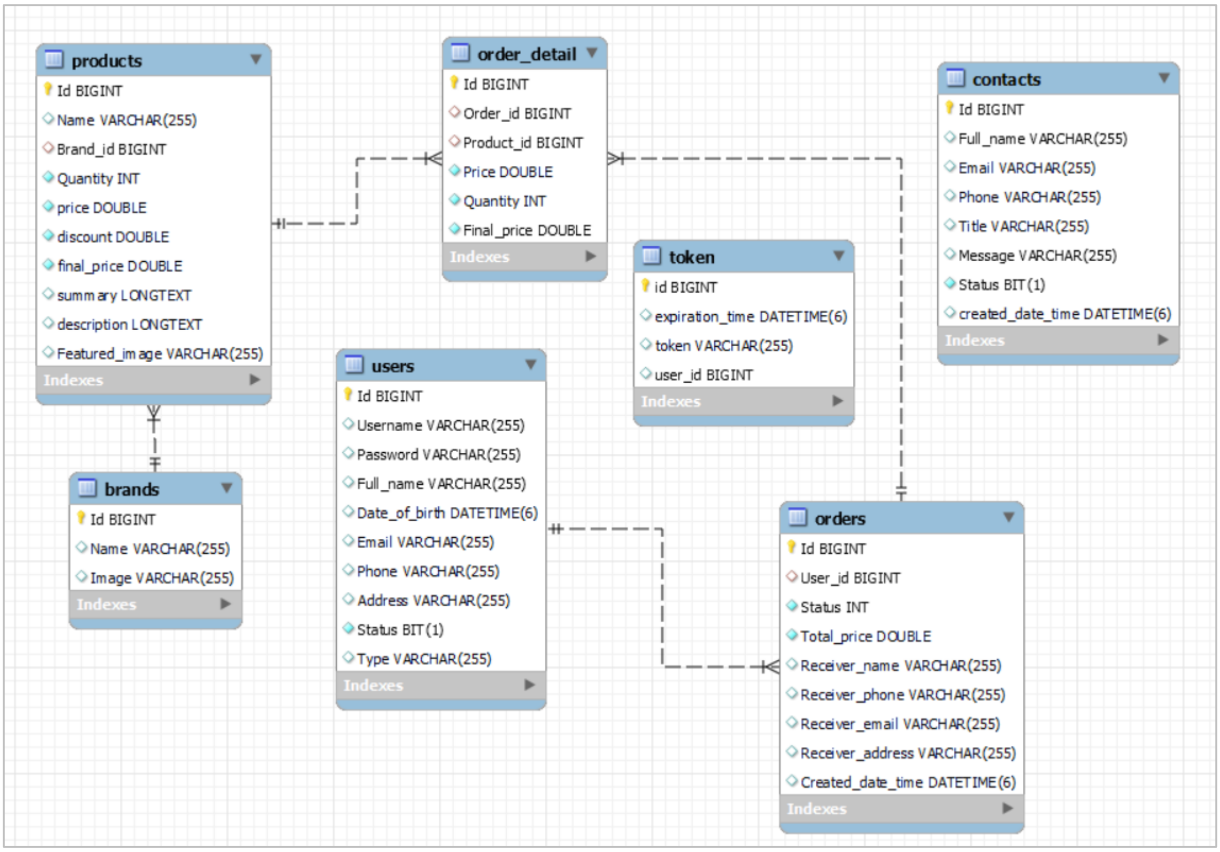


Figure 1: E-R Diagram

The ERD describes how database of this project runs. There are several tables including users, products, brands, orders, order_details, token and contacts.

3.2.2. Database Analysis

- **Users table**

Users table stores detail information of registered customers and admins.

Table 1: Description of user tables in database

No.	Property Name	Type	Description
1	Id	BIGINT	Primary key, id is used to distinguish user account from each other.
2	Username	Varchar(255)	Username is used to login.
3	Password	Varchar(255)	Password is to save password when a user login and password will be encoded with BCryptPasswordEncoder.
4	Full_name	Varchar(255)	Full_name is used to save full name of users with UNICODE support.
5	Date_of_birth	DATETIME(6)	Date_of_birth is used to save the date of birth of a user account.

6	Email	Varchar(255)	Email is used verify authentication.
7	Phone	Varchar(255)	Phone is used to save phone number of a user account.
8	Address	Varchar(255)	Address is used to save address of a user account.
9	Status	BIT(1)	Status is used to save the status (enable / disable) of a user account.
10	Type	Varchar(255)	Type is used to distinguish type of user (user or admin)

- **Brands table**

  Brands table stored detail information of brands (e.g., Apple, Samsung, Xiaomi).

Table 2: Description of brands table in database

No.	Property Name	Type	Description
1	Id	BIGINT	Primary key, id is used to distinguish brand from each other.
2	Name	Varchar(255)	Name is used to save name of brand.
3	Image	Varchar(255)	Image is used to save path of brand image.

- **Products Table**

  Products table stored detail information of products.

Table 3: Description of products table in database

No.	Property Name	Type	Description
1	Id	BIGINT	Primary key, id is used to distinguish product from each other.
2	Name	Varchar(255)	Name is used to save name of product.
3	Brand_id	BIGINT	Foreign key, brand_id is used to distinguish a brand from each other.
4	Quantity	Int	Quantity is used to save quantity of product.
5	Price	Double	Price is used to price of product.
6	Discount	Double	Discount is used to save discount of product when product is sale.
7	Final_price	Double	Final_price is used to save price after discount.
8	Summary	LONGTEXT	Summary is used to save short description of product.

9	Description	LONGTEXT	Description is used to save description of product.
10	Featured_image	Varchar(255)	Featured_image is used to save the path of the product featured image.

- **Orders Table**

  Orders table stored detail information of orders.

Table 4: Description of orders table in database

No.	Property Name	Type	Description
1	Id	Bigint	Primary key, id is used to distinguish order from each other.
2	User_id	Bigint	Foreign key, user_id is used to distinguish an user from each other.
3	Status	Bit(1)	Status is used to save the status of order.
4	Total_price	DOUBLE	Total_price is used to save the total price of order.
5	Receiver_name	VARCHAR(255)	Receiver_name is used to save name of receiver with UNICODE support.
6	Receiver_phone	VARCHAR(255)	Receiver_phone is used to save phone of receiver.
7	Receiver_email	VARCHAR(255)	Receiver_email is used to save email of receiver.
8	Receiver_address	VARCHAR(255)	Receiver_address is used to save address of receiver with UNICODE support.
9	Created_date_time	Datetime(6)	Created_date_time is used to save when the order was created.

- **OrderDetail Table**

  OrderDetail table stored detail information of the detail of the orders.

Table 5: Description of order_detail table in database

No.	Property Name	Type	Description
1	Id	Bigint	Primary key, id is used to distinguish order detail from each other.
2	Order_id	Bigint	Foreign key, order_id is used to distinguish an order from each other.
3	Product_id	Bigint	Foreign key, product_id is used to distinguish a product from each other.

4	Price	Double	Price is used to save price of product when user paid.
5	Quantity	Int	Quantity used to save the number of products the user wants to buy.
6	Final_price	Double	Final_price is the price that must be paid for this order.

- **Contacts table**

Contacts table stored detail information of the detail of the contacts from users.

Table 6: Description of contacts table in database

No.	Property Name	Type	Description
1	Id	Bigint	Primary key, id is used to distinguish order detail from each other.
2	Full_name	Varchar(255)	Full_name used to save name of customer who send the contact.
3	Email	Varchar(255)	Email used to save email of customer who send the contact.
4	Phone	Varchar(255)	Phone used to save phone number of customer who send the contact.
5	Title	Varchar(255)	Title is used to save title of the contact.
6	Message	Varchar(255)	Message is used to save content of the contact.
7	Status	Bit(1)	Status is used to save the status (new / processed) of the contact.
8	Created_date_time	Datetime(6)	Created_date_time is used to save when the contact is created.

- **Token table**

Token table stored detail information of the token for users when change password.

Table 7: Description of token table in database

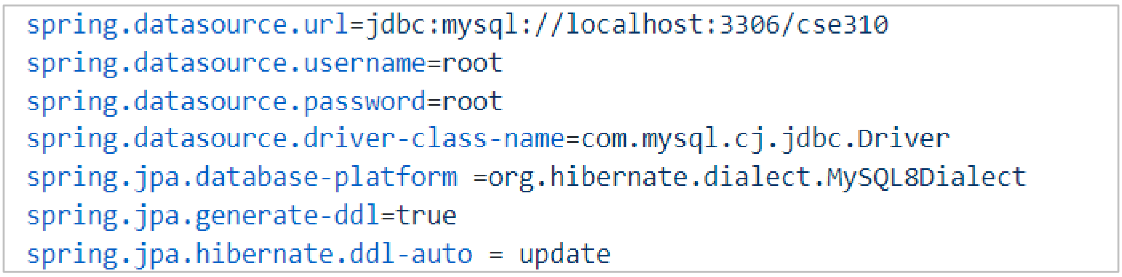
No.	Property Name	Type	Description
1	Id	Bigint	Primary key, id is used to distinguish order detail from each other.
2	User_id	Bigint	User_id is used to save id of user who want to change password.
3	Token	Varchar(255)	Token is used to save token for user who want to change password.

4	Expiration_time	DATETIME(6)	Expiration_time is used to used to determine the time when the token expires.

3.3. Configuration Spring Boot

3.3.1. Connect with database

The way to connect database is configured in file .properties

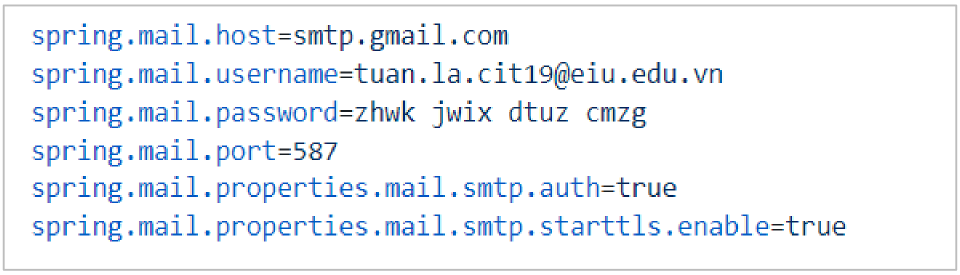


```
spring.datasource.url=jdbc:mysql://localhost:3306/cse310
spring.datasource.username=root
spring.datasource.password=root
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
spring.jpa.database-platform =org.hibernate.dialect.MySQL8Dialect
spring.jpa.generate-ddl=true
spring.jpa.hibernate.ddl-auto = update
```

Figure 2: Configuration of database in .properties file

3.3.2. Configure Gmail SMTP Server

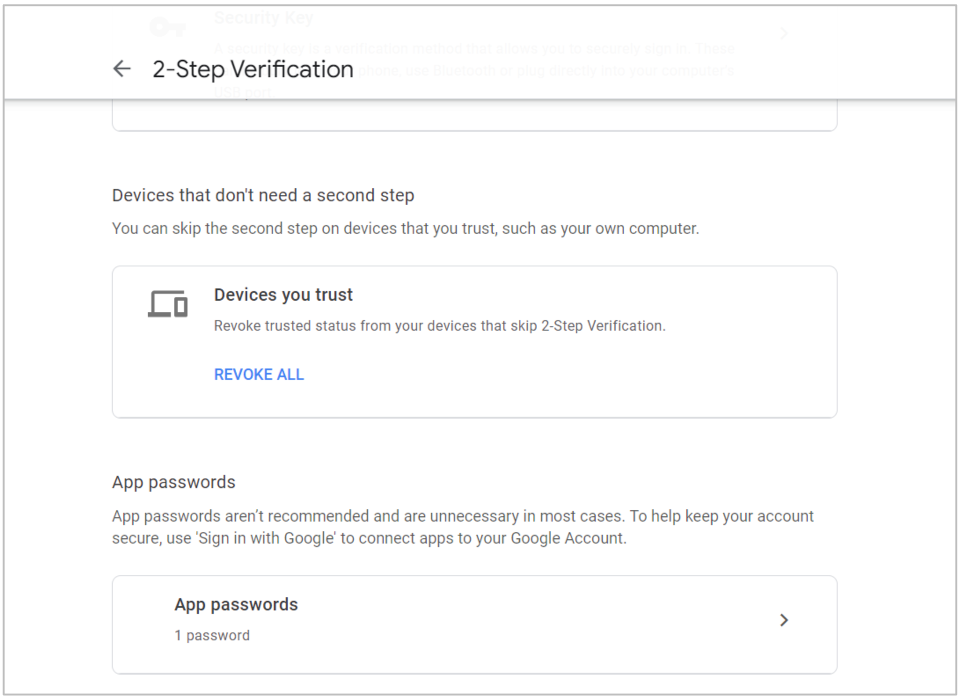
- Open file .properties and update the following variable:



```
spring.mail.host=smtp.gmail.com
spring.mail.username=tuan.la.cit19@eiu.edu.vn
spring.mail.password=zhwk jwix dtuz cmzg
spring.mail.port=587
spring.mail.properties.mail.smtp.auth=true
spring.mail.properties.mail.smtp.starttls.enable=true
```

Figure 3: Configuration of Gmail SMTP Server in .properties file

- Setting for your Google Account. Moving on Security tab in your google account setting and then turn on 2-step verification. After that, you will create an app passwords for your website (including 16 random characters).



Security Key

A security key is a verification method that allows you to securely sign in. These ... phone, use Bluetooth or plug directly into your computer's USB port.

2-Step Verification

Devices that don't need a second step

You can skip the second step on devices that you trust, such as your own computer.

Devices you trust

Revoke trusted status from your devices that skip 2-Step Verification.

REVOKE ALL

App passwords

App passwords aren't recommended and are unnecessary in most cases. To help keep your account secure, use 'Sign in with Google' to connect apps to your Google Account.

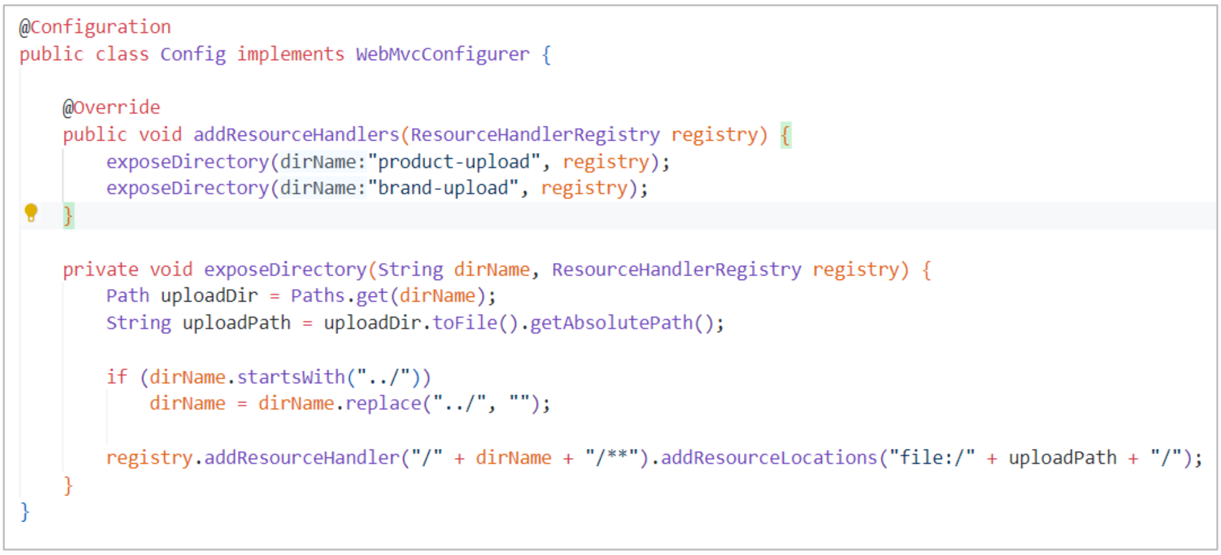
App passwords

1 password

Figure 4: Setting Gmail account

3.3.3. Configure upload folder

Create file .java with the following code:



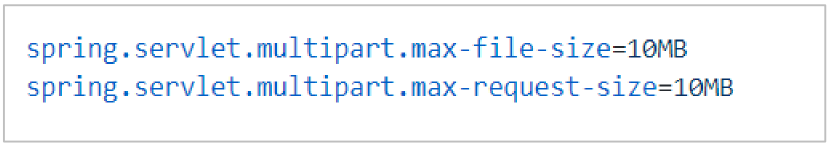
```
@Configuration
public class Config implements WebMvcConfigurer {

    @Override
    public void addResourceHandlers(ResourceHandlerRegistry registry) {
        exposeDirectory(dirName:"product-upload", registry);
        exposeDirectory(dirName:"brand-upload", registry);
    }

    private void exposeDirectory(String dirName, ResourceHandlerRegistry registry) {
        Path uploadDir = Paths.get(dirName);
        String uploadPath = uploadDir.toFile().getAbsolutePath();

        if (dirName.startsWith("../"))
            dirName = dirName.replace("../", "");

        registry.addResourceHandler("/" + dirName + "/**").addResourceLocations("file:/" + uploadPath + "/");
    }
}
```

Figure 5: Configuration of upload image folder

Here, I configure Spring MVC to allow access to the directory **product-upload** in the file system, with mapping to the application’s context path as **/product-upload**.

3.3.4. Configure image size

Open file .properties and update the following variable:



```
spring.servlet.multipart.max-file-size=10MB
spring.servlet.multipart.max-request-size=10MB
```

Figure 6: Configuration of upload image size

3.4. Completed Function for Back-end Development

3.4.1. Login and Logout function

In this function, the server receives the username and password from the login form on the Login Page. Subsequently, it retrieves the user from the database based on the provided username and verifies the correctness of the password. If the user's type is identified as "admin," the system directs the user to the Dashboard Page; otherwise, the user is redirected to the Home Page.

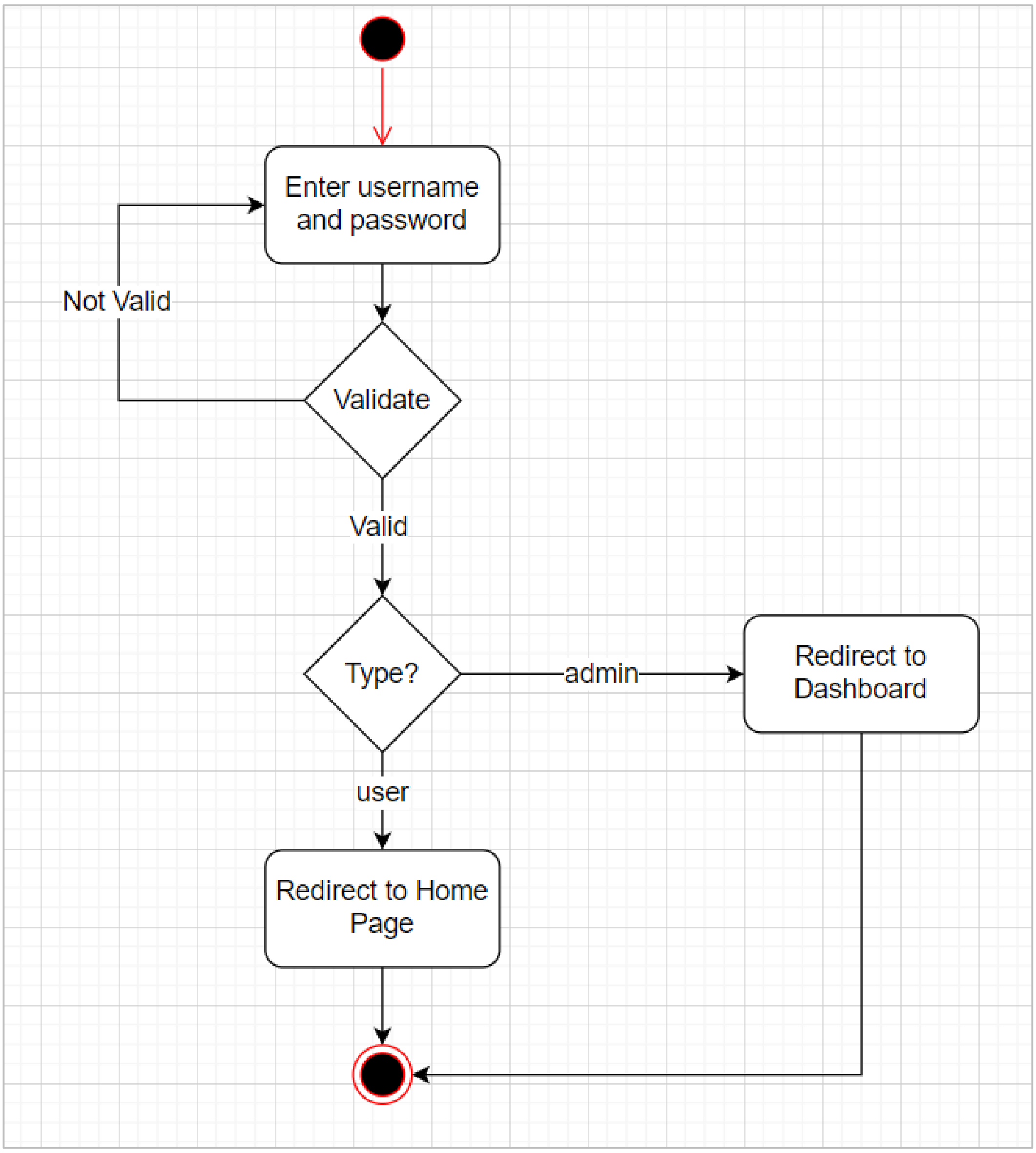


Figure 7: Login activity diagram

3.4.2. Register a new account

Upon receiving a User object from a registration form, the server processes details such as username, password, and user type. Employing the BCryptPasswordEncoder ensures the secure encoding of the password, enhancing overall system security. If the user registers via the Register Page, the user type is set to “user,” designating a regular user account. Alternatively, if the registration occurs through the Dashboard, the user type is set to “admin.” The server then persistently stores the user information in the database. Subsequently, the user is redirected to the Login Page, completing the registration process seamlessly.

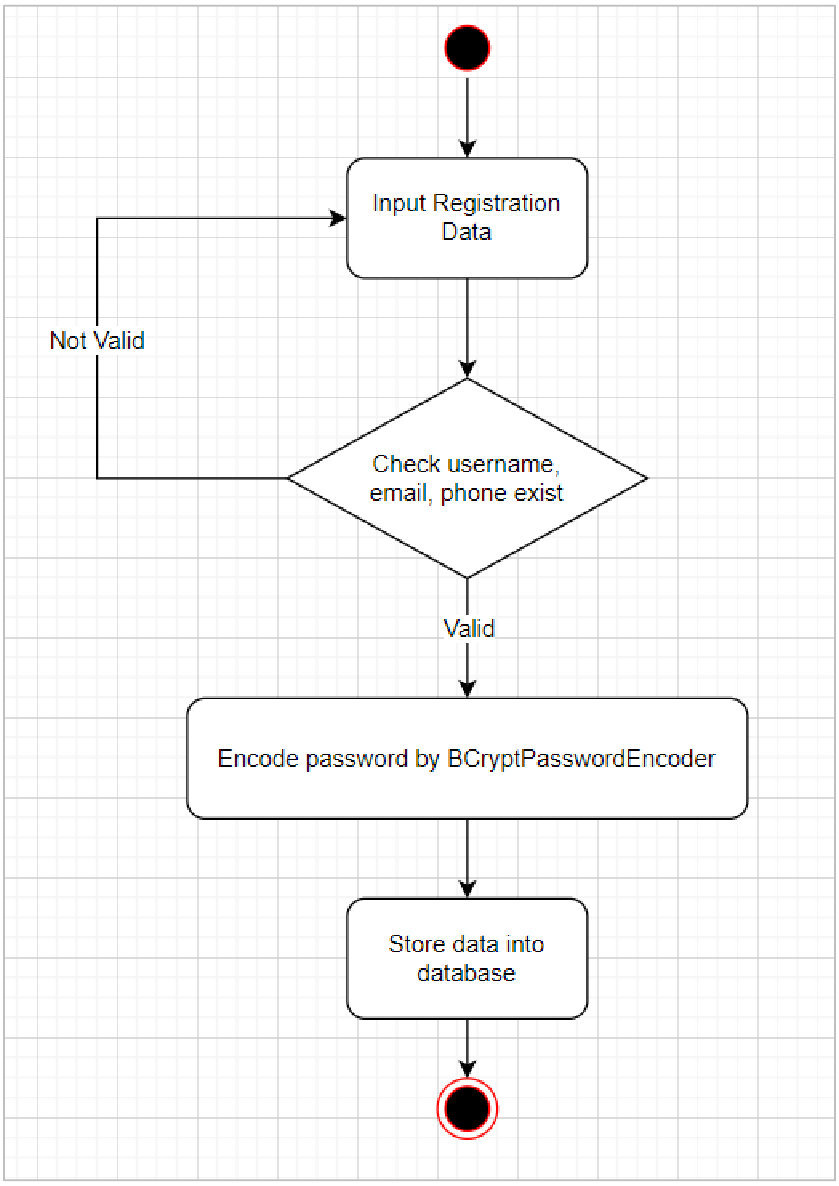

Input Registration Data
Not Valid
Check username, email, phone exist
Valid
Encode password by BCryptPasswordEncoder
Store data into database

Figure 8: Register activity diagram

3.4.3. Password functions

In this function, the server handles the recovery of a user’s password. It receives a token and a new password from a provided link. Utilizing the token, the server identifies the corresponding user and proceeds to update the user's password after securely encoding it. This secure process ensures that the user's password is successfully reset and updated in the system.

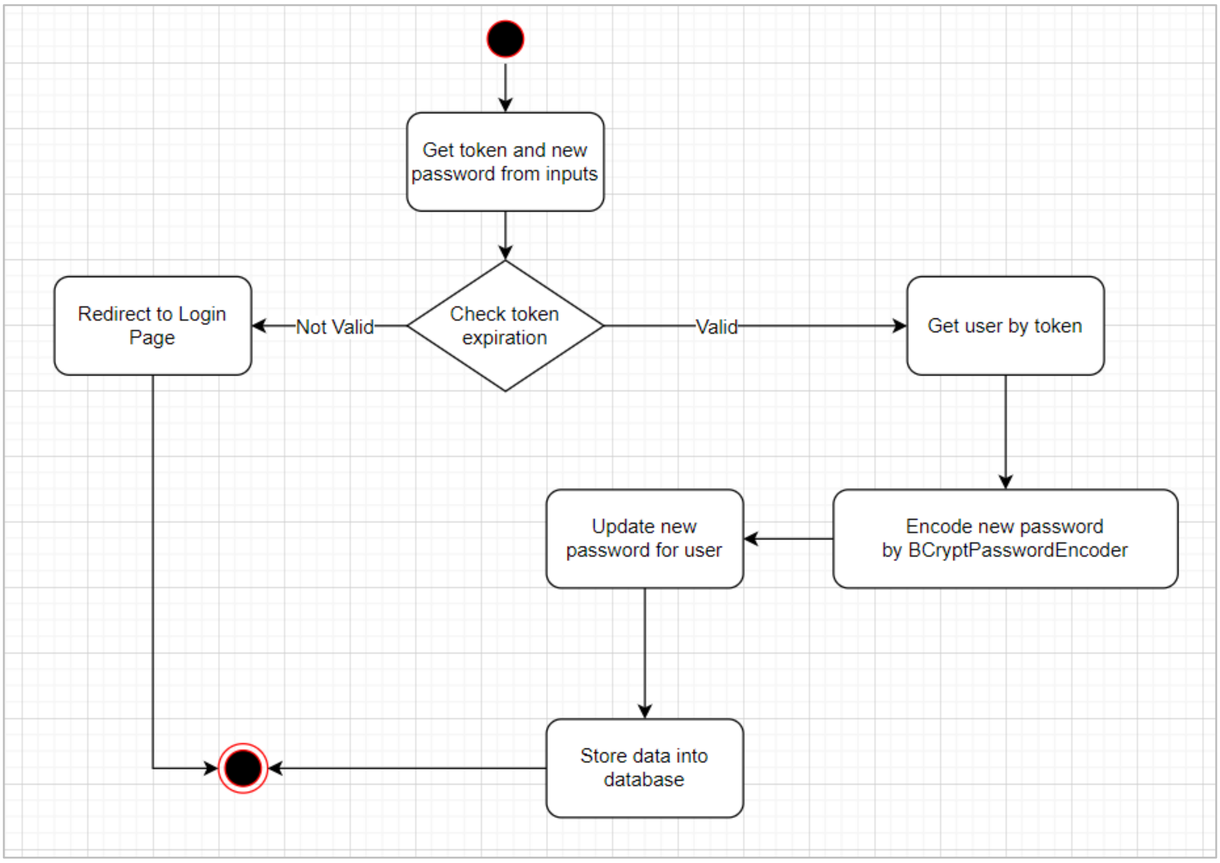

Get token and new password from inputs
Redirect to Login Page
Not Valid
Check token expiration
Valid
Get user by token
Update new password for user
Encode new password by BCryptPasswordEncoder
Store data into database

Figure 9: Reset password activity diagram

3.4.4. Showing profile of user

In this function, the server retrieves the User object from the session to display information on the Profile Page. If the User object is null, indicating that the user is not authenticated or logged in, the server redirects the user to the Login Page to ensure proper authentication before accessing the Profile Page.

3.4.5. Showing history order

In this server-side function, the application retrieves the User object from the session, leveraging it to fetch all orders placed by the user. The retrieved orders are then paginated, incorporating the page number and pertinent information into the model.

3.4.6. Showing products

This function handles the retrieval and display of products based on specified criteria such as price range, keywords, and brands. It utilizes pagination to organize the products into manageable pages. The function accepts parameters for minimum and maximum prices, search keywords, selected brands, and the page number. The code implements conditional checks to tailor the product retrieval process based on the provided parameters, ensuring a flexible and dynamic search experience for users. The resulting paginated product data is then sent to the view for rendering.

3.4.7. Showing a product detail

The function is designed to display detailed information about a product on a dedicated product details page. It receives the product's name as a parameter to retrieve the corresponding product from the database. The retrieved product is then added to the model, and the function returns the view name "user/productDetail.html" for rendering the product details page.

3.4.8. Cart functions

- Add to cart function: This function handles the process of adding products to the user's shopping cart. It receives the product ID, quantity, and the user's session information. The user is first checked for authentication, and if authenticated, the corresponding user's cart is retrieved or created. The selected product is then added to the cart, and if the product is already in the cart, the quantity is updated. The total price of the cart is recalculated, and the changes are persisted in the database.

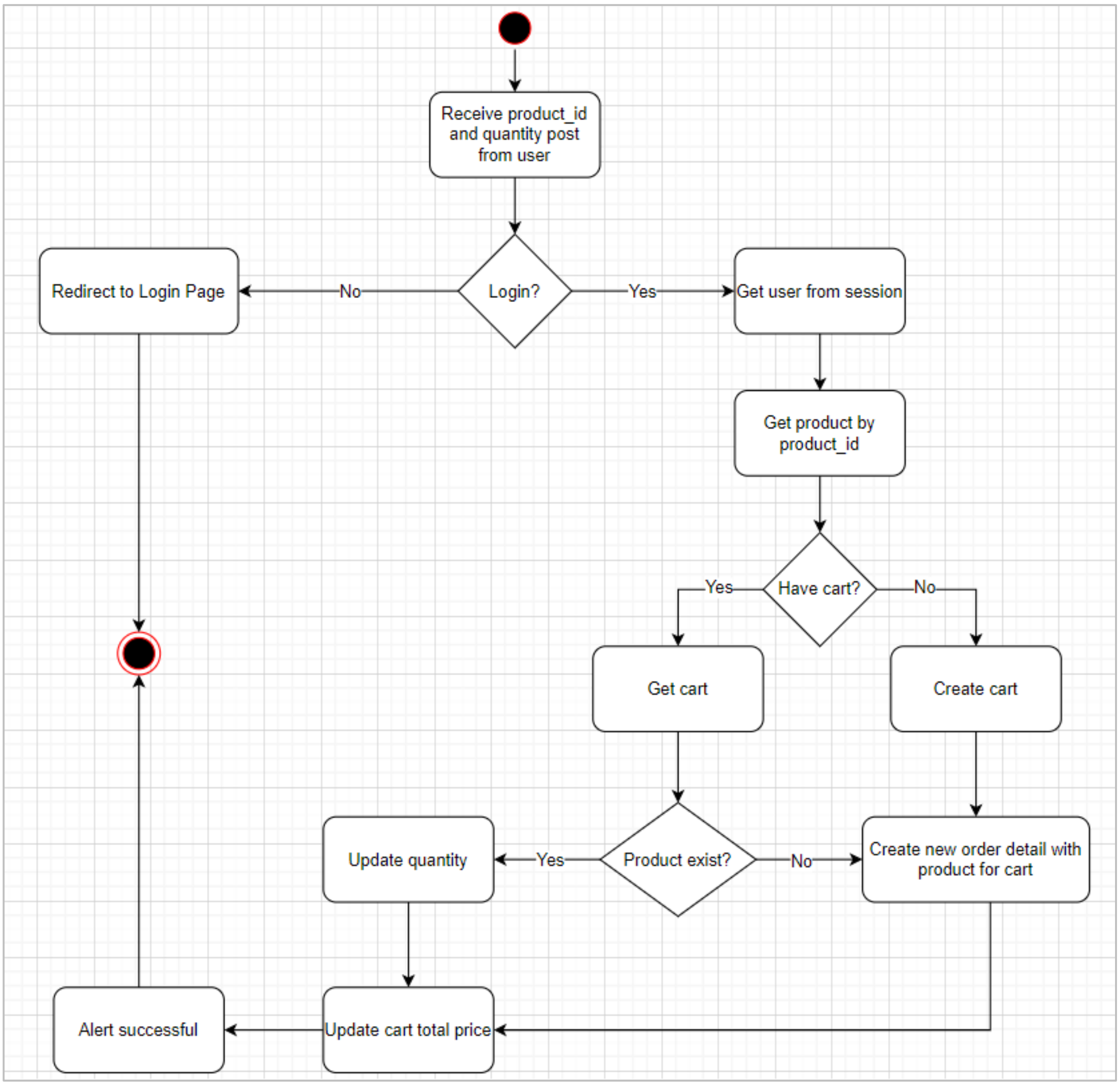


Figure 10: Add to cart activity diagram

– Remove cart item: This function handles the removal of a specific item from the user's shopping cart. It takes the item's ID as a parameter and attempts to retrieve the corresponding OrderDetail from the service. The method then adjusts the total price of the associated order by subtracting the removed item's final price. The orderDetailService.delete(id) is called to remove the item from the database. If the removal results in an empty cart, the associated order is also deleted.

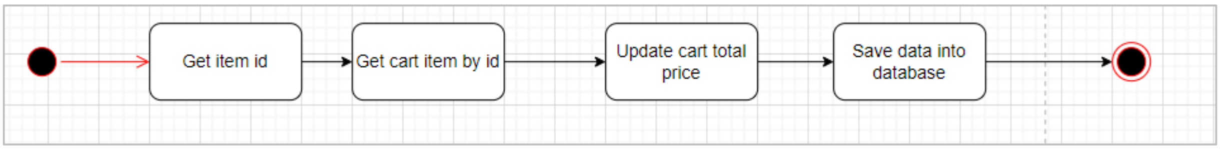


Figure 11: Remove cart item activity diagram

– Clear cart function: This function handles deletion of the user's cart. It retrieves the user from the session, then fetches the corresponding cart (Order) using the `orderService.getCart` method. If the cart exists, it is deleted using `orderService.delete(order)`.

– Update cart function: This function handles the updating of items in the user's shopping cart. It receives information about the products and quantities to be updated. The method iterates through each item in the data, adjusts the quantities, and updates the corresponding OrderDetails. If the quantity becomes zero, the OrderDetail is deleted. The total price of the order is then recalculated, and if the cart becomes empty, the entire order is deleted.

– Checkout function: This function handles the checkout process when a user confirms their order. It receives various parameters such as the order ID, product names, quantities, and user information. The method then iterates through the selected products, updates their quantities, and creates corresponding OrderDetails. The Order object is then updated with the user's information, status, and creation timestamp before being saved.

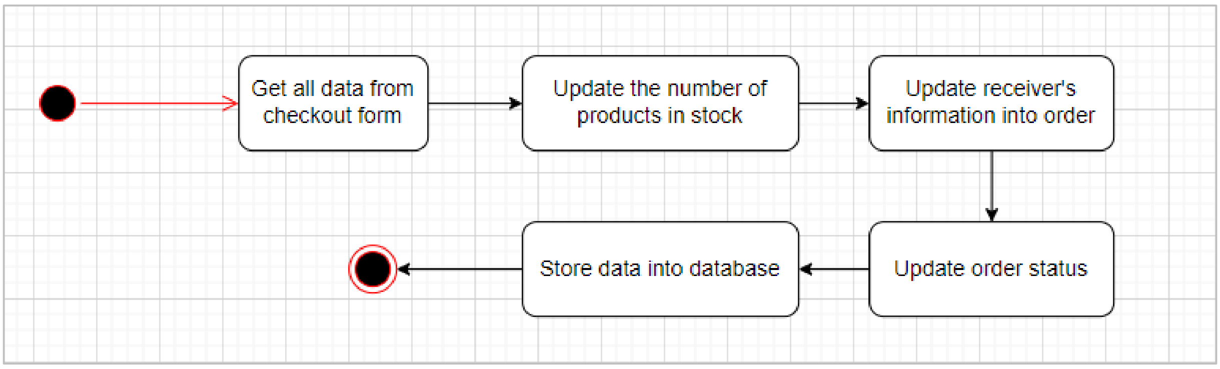

Get all data from checkout form
Update the number of products in stock
Update receiver's information into order
Update order status
Store data into database

Figure 12: Checkout activity diagram

3.4.9. Send contact messages

This Java method handles the saving of contact form submissions. It receives the contact details as a Contact object, and save it into database, and sets an "alert" attribute to "true" in the model upon successful submission. In case of an exception, it sets the “alert” attribute to “false” and redirects back to the contact page.

3.4.10. Showing DashBoard

These Java methods are annotated with @GetMapping to handle requests to specific admin pages. Each method populates the model with data relevant to the corresponding page (users, brands, products, orders, contacts) obtained from the respective services. The return statement specifies the HTML template to be rendered for each admin page. Ensure that the HTML templates (adminpage-users.html, adminpage-brands.html, etc.) exist and are appropriately configured.

3.4.11. Function in DashBoard

a) Add and Edit

Add and Edit product / brand: This Java method, annotated with @PostMapping, is responsible for saving product and brand information along with an associated image. It uses the productService / brandService to save the product / brand and calculates the file path for the uploaded image. The saveFile method is called to store the uploaded file. After saving, the success alert is added to the model. In case of an error, the error alert is added, and the method redirects back to the admin page for products and brands.

b) Delete and Disable/Enable

- Delete product: This Java method, annotated with @GetMapping, is responsible for deleting a product. It uses the productService to find the product by its ID and checks if the product has associated order details. If the product has no order details, it is deleted along with its associated image file. The success or warning alert is added to the model based on the outcome. In case of an error, the error alert is added, and the method redirects back to the admin page for products.
- Delete brand: This Java method, annotated with @GetMapping, is responsible for deleting a product. It uses the brandService to find the brand by its ID and checks if the brand has associated products. If the brand has no products, it is deleted along with its associated image file. The success or warning alert is added to the model based on the outcome. In case of an error, the error alert is added, and the method redirects back to the admin page for brands.
- Disable / Enable user: This Java method, annotated with @GetMapping, is responsible for toggling the status of a user. It uses the userService to find the user by its ID then toggles the user’s status and saves the changes. The success or error alert is added to the model based on the outcome. In case of an error, the error alert is added, and the method redirects back to the admin page for users.

c) Order function (Admin)

This function, annotated with @GetMapping, is responsible for updating the status of an order. It uses the orderService to find the order by its ID then updates the order's status and saves the changes. The method then redirects back to the admin page for orders.

d) Contact function (Admin)

This Java method, annotated with @GetMapping, is responsible for toggling the status of a contact. It uses the contactService to find the contact by its ID and checks then toggles the contact's status and saves the changes. The success or error alert is added to the model based on the outcome. In case of an error, the error alert is added, and the method redirects back to the admin page for contacts

3.5. Completed Function for Front-end Development

In this section, I will present HTML code using Thymeleaf.

3.5.1. Login function

The function has a form with a "/login" action, a "post" method, and a form that includes two inputs (username and password).

3.5.2. Register a new account

The provided HTML code encapsulates a registration form utilizing Thymeleaf templating. The form, set to submit data to the "/register" endpoint using the HTTP "POST" method, is associated with a Thymeleaf object named "saveuser." Key user details, including the username, password, date of birth, phone number, email, and address, are captured through corresponding input fields dynamically linked to the Thymeleaf object's properties. Mandatory fields are marked with the "required" attribute, ensuring user input completeness.

3.5.3. Password functions

- Forgot password form: The HTML code provided establishes a password recovery form designed for user interaction. Employing the "POST" method and directed to the "/forgot-password" endpoint. The email input field, labeled with "RecoverEmail" is set up for user input. Additional attributes such as "autocorrect" are configured to enhance the user experience. A submission button, styled as a default button, triggers the form's action.

- Reset password form: The presented HTML code represents a password reset form designed for user interaction in a web application. Utilizing the "POST" method and directed to the "/reset-password" endpoint. The form includes a hidden input field named "token," dynamically populated with a Thymeleaf expression "${token}" for secure token handling during the password reset process. Two password input fields, one for entering the new password and another for confirming the password, are included within form groups for styling and organization. Each password input is accompanied by an eye-slash icon, suggesting a potential feature for toggling password visibility. A submit button labeled “Submit” triggers the form action.

3.5.4. Showing profile of user

The HTML code represents a user profile box. The box features user information dynamically populated using Thymeleaf expressions. Details such as the user’s full name, username, date of birth, email, phone number, and address are presented within the profile box. Each piece of information is accompanied by an edit icon, suggesting the potential for user interaction to update or modify these details. Icons from the Font Awesome library, such as the calendar, envelope, phone, and map marker icons, enhance the visual representation of the respective user attributes.

3.5.5. Showing history order

The provided HTML code constitutes a dynamic and responsive section dedicated to displaying user orders within a web application. The structure includes conditional logic to handle scenarios where the user hasn’t placed any orders. For each existing order, a detailed order box is presented, containing information such as product name, status, quantity, total price, and actions like viewing details or canceling the order. Utilizing Thymeleaf expressions, the code ensures flexibility in dynamically populating and updating order information. Additionally, a pagination component is integrated, allowing users to navigate through their order history conveniently. The layout follows a clean and organized design, fostering a user-friendly experience for reviewing and managing their orders.

3.5.6. Showing products

The presented HTML code establishes a dynamic and visually appealing product layout for a web-based shopping application. Utilizing Thymeleaf expressions, the code handles scenarios where there are products to display and when there are none. In the former case, the layout features a grid view of individual product cards, each showcasing product images, names, prices, and optional discount percentages. Users can interact with the products by adding them to their cart with the provided “Add to Cart” button. Pagination controls at the bottom enable easy navigation through multiple pages of products. In the latter case, when no products are available, a message is displayed indicating the absence of products at the moment.

3.5.7. Showing a product detail

The HTML code represents a detailed product page layout for an e-commerce website. It includes essential information about the product such as its name, brand, pricing details (original and discounted prices), availability, and a brief summary. The page also features a countdown timer and allows users to adjust the quantity of the product before adding it to the cart. Additionally, users can make a direct purchase with the “Buy it now” button. The product description is presented in a separate section, providing users with a comprehensive overview of the product.

3.5.8. Cart

– The provided HTML code represents a structured table layout for a shopping cart page in an e-commerce website. Each row of the table corresponds to a product in the user’s cart, displaying information such as product image, name, price, quantity, and subtotal. Users can adjust the quantity of each product using input fields and remove items from the cart with a corresponding button. The total order amount is shown at the bottom of the table. The page includes action buttons allowing users to proceed to checkout, continue shopping, update the cart, or clear it entirely.

– Clear cart function: This JavaScript code utilizes jQuery to handle a click event on an element with the class “clear-cart” within an element with the class “all-cart-buttons.” When triggered, it initiates an asynchronous POST request to the ‘/clear-cart’ endpoint. Upon receiving the response data, the code checks if the data is true. If it is, it updates the local storage with the key “alert-action” and the value of the response data, and then reloads the page. In case the data is false, it still updates the local storage but without reloading the page.

– Update cart function: This JavaScript code, using jQuery, handles a click event on an element with the class “update-cart” within an element with the class “all-cart-buttons.” When triggered, it constructs a JSON array named “postdata” by iterating over the input fields containing product quantity information. The data is then sent as a JSON object in an asynchronous POST request to the ‘/update-cart’ endpoint. Upon receiving the response data, the code checks if it is true. If true, it updates the local storage with the key “alert-action” and the value of the response data, followed by reloading the page. In case the data is false, it still updates the local storage without reloading the page.

3.5.9. Send contact messages

This HTML code represents a contact form with a “post” method and an action attribute set to “/submit_contact_form”. The form includes fields for the user’s full name, email, phone number, title, and a message. Each input field has an associated label and placeholder for user guidance. The phone number field has an “onkeydown” attribute to ensure only numeric input. The form is styled with various classes for layout and appearance. Upon submission, the form sends the entered data to the “/submit_contact_form” endpoint.

3.5.10. Showing DashBoard

- Users table: Table includes columns such as user number, username, full name, phone number, email, date of birth, address, user type, and a function column for editing and enabling/disabling users. The table is populated dynamically using Thymeleaf’s iteration capabilities to loop through a collection of users and display their details in the respective columns. Each row contains user-specific data, and the “Function” column provides buttons for editing user details and toggling the user’s status between active and disabled.

- Brands table: The table displaying a list of brands. It consists of four columns: “No.” for numbering, “Brand Image” displaying the brand’s image as a clickable link, “Brand Name” showing the brand’s name, and “Function” containing buttons for editing and deleting each brand. The table is populated with brand data fetched dynamically using Thymeleaf. The “Edit” button triggers the “editBrand” function, and the “Delete” button is associated with the “delete_confirm” function, which prompts a confirmation before deletion. Additionally, the delete button is disabled if the brand has associated products, preventing accidental deletion.

- Products table: The table displaying product information within a web application. The table has columns for the product’s serial number, image, name, brand, quantity, price, and functional buttons. The product details, such as name, brand, quantity, and price, are dynamically populated using Thymeleaf expressions. Each row in the table corresponds to a product, and the “Edit” button links to the product editing page, while the “Delete” button triggers a confirmation dialog through a JavaScript function, with the ability to disable it if the product has associated order details.

- Orders table: The table has columns for order details, including the order number, ordered date, recipient’s name, phone number, address, total price, order status, and various functions related to order processing. Each row corresponds to a specific order, and the “Function” column includes buttons for actions such as processing, marking as done, and canceling orders. The order status is dynamically displayed, and the table is styled using Bootstrap classes for a clean and organized appearance.

- Contacts table: The table labeled “contacts” with various columns, including “No.,” “Time,” “Full Name,” “Email,” “Phone,” “Title,” “Message,” and “Status.” The table is dynamically populated with contact information retrieved from a Thymeleaf model variable named “contacts.” Each row represents an individual contact entry, displaying details such as the contact number, creation time, full name, email, phone number, title, message, and the current status. The “Status” column includes a button linking to the “/processContact/” endpoint with the contact’s ID, allowing for further processing.

3.5.11. Function in DashBoard

- Save and Edit user: The form uses Thymeleaf syntax to bind with a “saveUser” object, enabling two-way data binding between the HTML form and the server-side model. It consists of input fields for username, password, full name, date of birth, phone, email, address, and user type. The password field includes a toggle button to reveal or hide the entered password. The form also provides dropdown selection for user type, allowing the user to choose between “User” and “Admin.” Additionally, there are buttons for submitting the form to save changes and canceling the operation, which redirects the user to the admin page for managing users.
- Save and Edit brand: The form has a “post” method and an action attribute set to “/saveBrand”. It includes a file input for uploading the brand image, styled using the Dropify library for an enhanced user experience. Users can either drag and drop a file or click to upload. The form also includes a text input for entering the brand name. Upon submission, the form sends the entered data to the “/saveBrand” endpoint with the associated brand image and name. Additionally, the form provides buttons for saving the information and canceling the operation, each with corresponding actions.
- Save and Edit product: The form utilizes Thymeleaf attributes for dynamic content binding and is configured to handle product data, including the product image, name, brand, cost, quantity, discount, summary, and description. It includes a file input for uploading product images using the Dropify plugin, as well as various text input fields and a dropdown menu for selecting the brand. The form is structured into sections, where the first section allows users to upload or change the product image, the second section contains inputs for basic product details, and the third section includes fields for summary and description. Upon submission, the form sends a POST request to the “/saveProduct” endpoint, and there are buttons for saving or canceling the operation.

CHAPTER 4. EXPERIMENTAL RESULTS AND DISCUSSION

4.1. Installation Environment

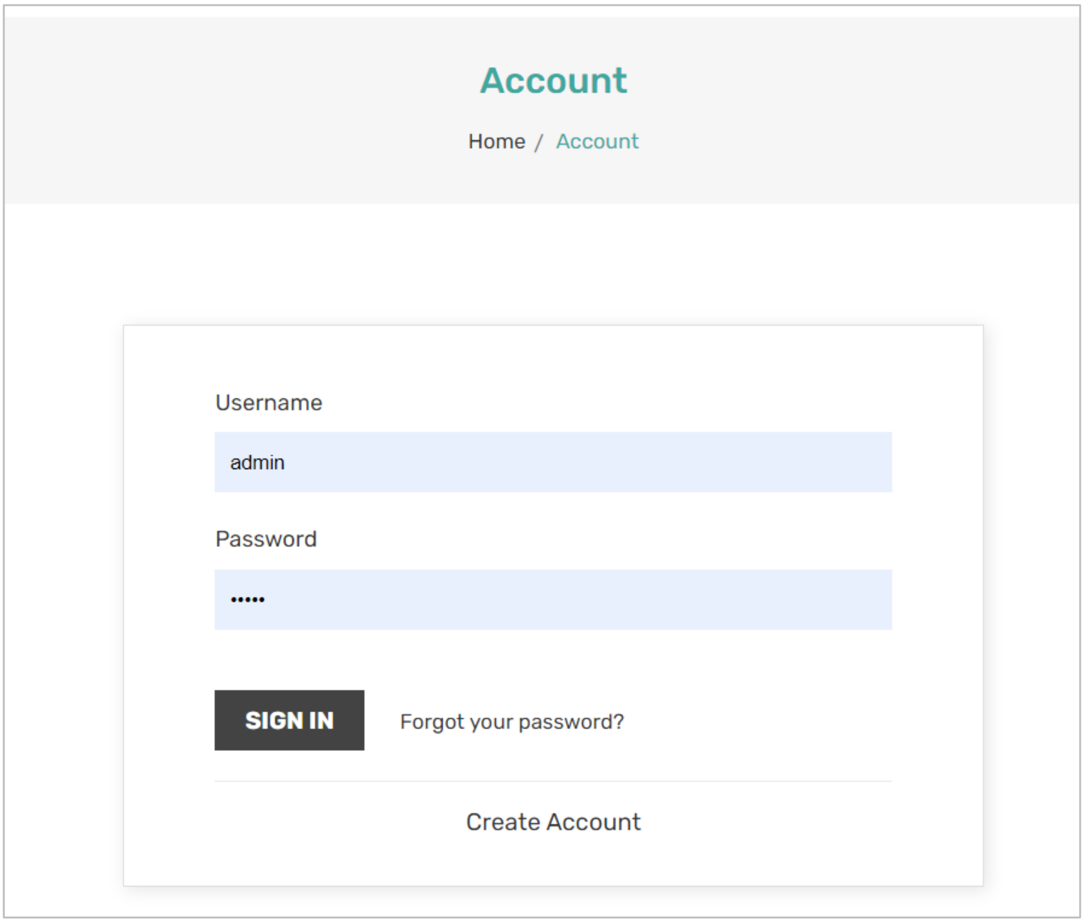
To install the application, in the project we use the following tools, libraries, software:

- Spring Boot version: 3.1.1
- Bootstrap version: v4.0.0-alpha.6 and v4.0.0
- Font-Awesome version: 4.5.0
- DataTables version 1.13.5
- JQuery version: 3.1.1
- MySQL workbench version: 8.0.31
- IDE Visual studio code: v1.8.1
- Computer: Core i5; Win 11 Home

4.2. Experimental Result and Discussion

4.2.1. Login Page

If a user login successfully, it will access to Home Page when type of the user is "user" and Users Admin Page when type of the user is "admin".



Username

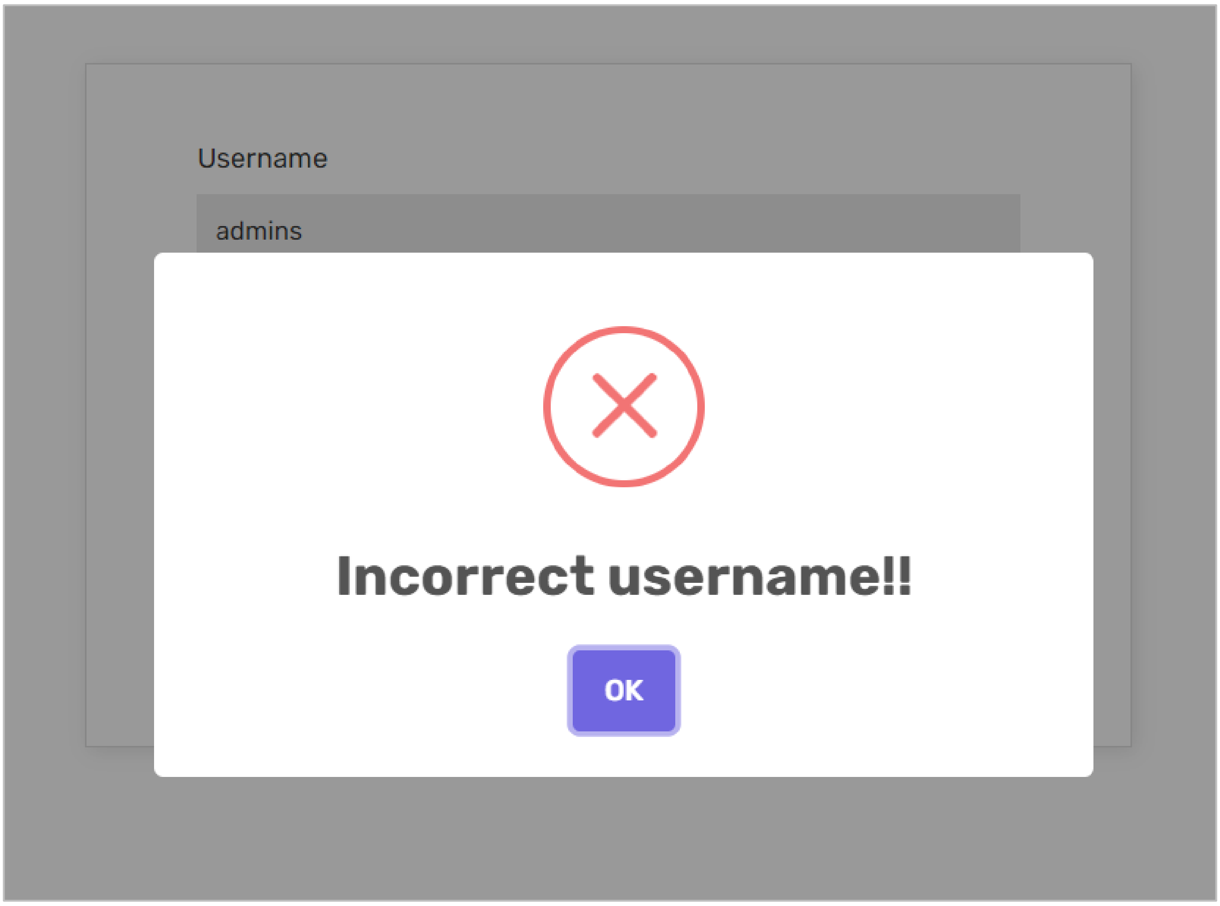
admin

Password

•••••

Figure 13: Login Page

The login page also includes a username validation mechanism that ensures accuracy before submitting the data to the server. If the entered username is either non-existent or incorrect, the page will promptly display an alert to notify the user.



Username

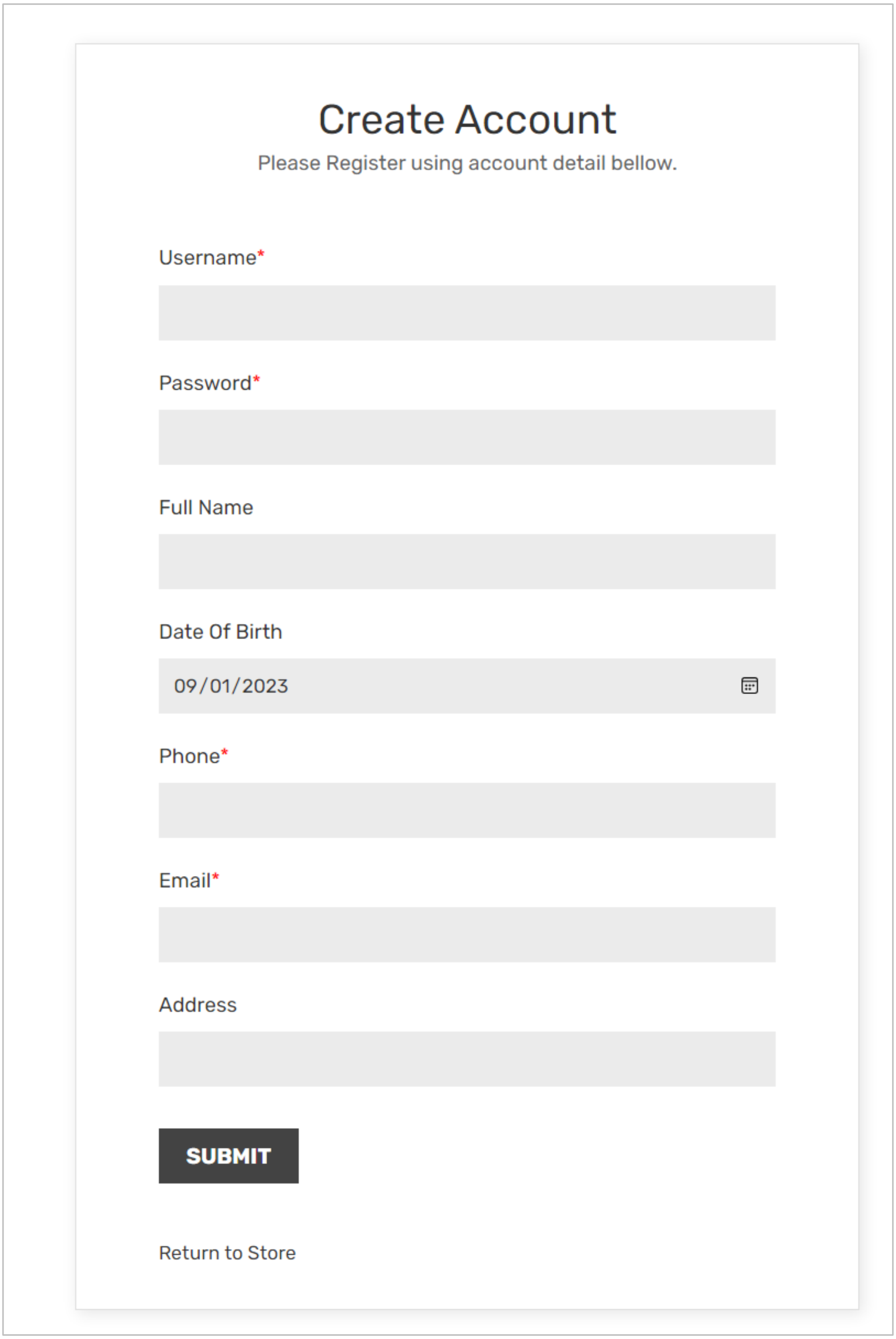
admins

Incorrect username!!

Figure 14: Warning on login page

4.2.2. Register Page

On this page, any user can register a new account, and if the entered username, email, or phone number already exists, the page will promptly display an alert to notify the user.



Create Account

Please Register using account detail bellow.

Username*

Password*

Full Name

Date Of Birth

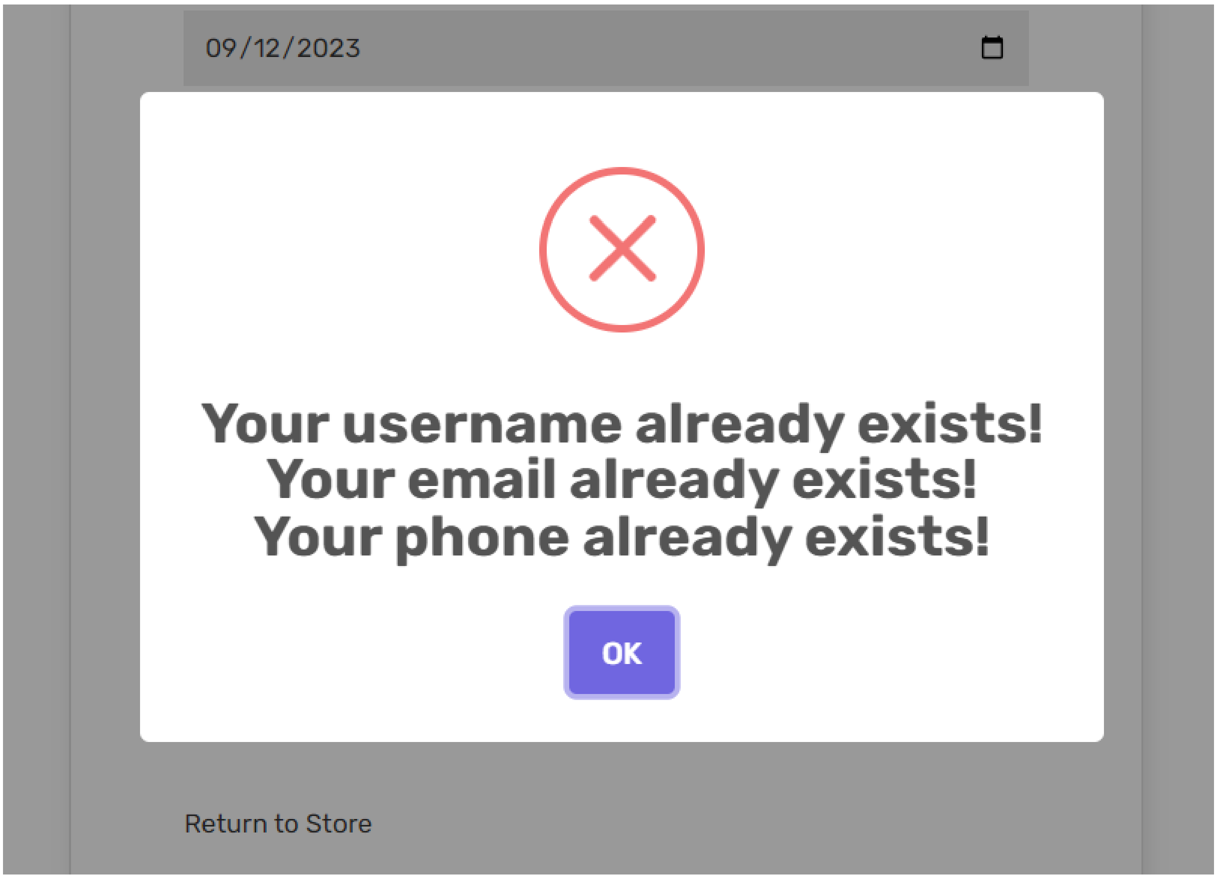
09/01/2023

Phone*

Email*

Address

Figure 15: Register Page



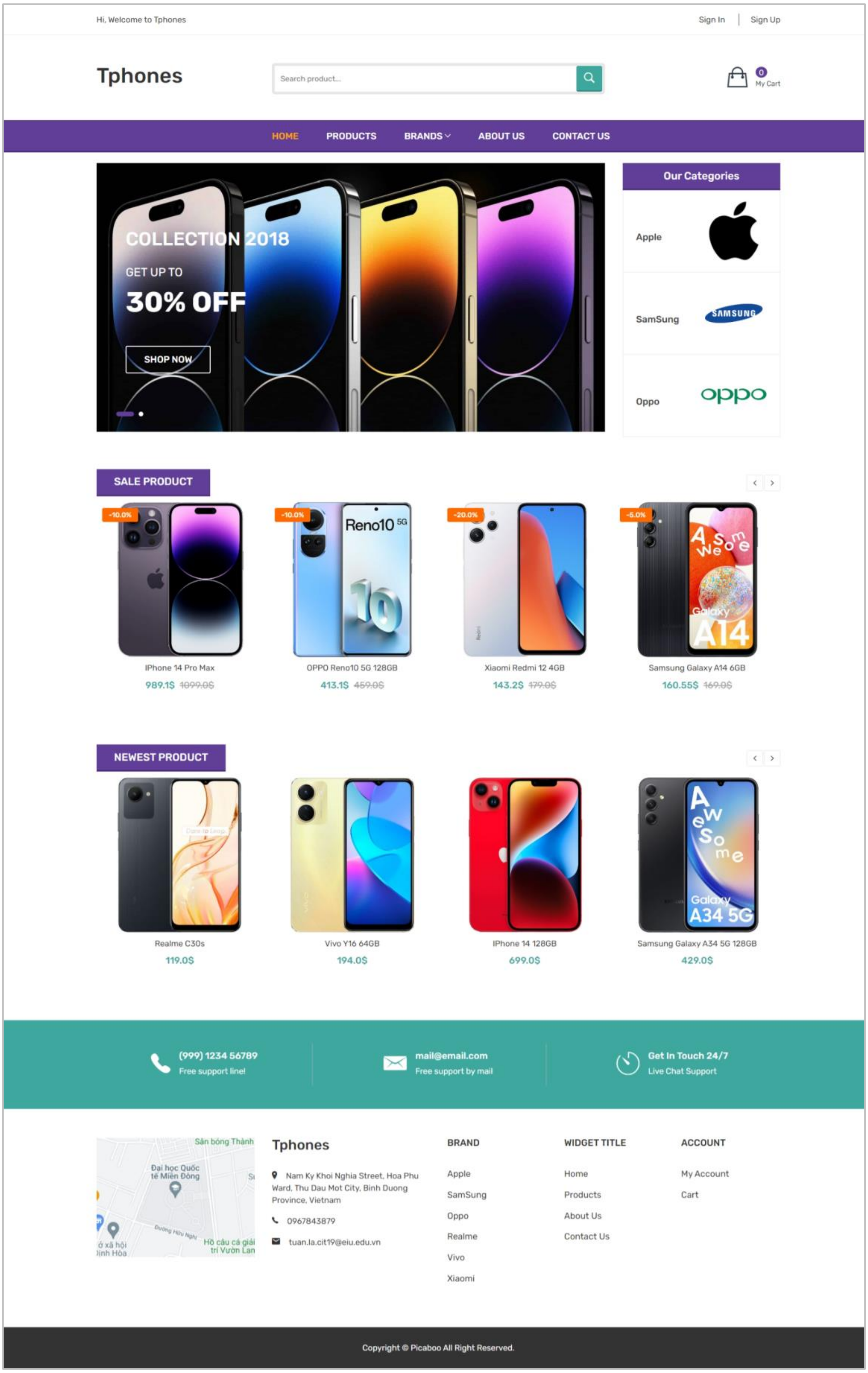
09/12/2023

Your username already exists!
Your email already exists!
Your phone already exists!

Figure 16: Warning on register page

4.2.3. Home Page

In this page, user see newest and sale products in every brand.



Hi, Welcome to Tphones

Sign In | Sign Up

Tphones

Search product...

0 My Cart

HOME PRODUCTS BRANDS ABOUT US CONTACT US

COLLECTION 2018

GET UP TO

30% OFF

SHOP NOW

Our Categories

Apple

SamSung

Oppo

SALE PRODUCT

-10.0%	-10.0%	-20.0%	-5.0%
IPhone 14 Pro Max	OPPO Reno10 5G 128GB	Xiaomi Redmi 12 4GB	Samsung Galaxy A14 6GB
989.1$ ~~1099.0$~~	413.1$ ~~459.0$~~	143.2$ ~~179.0$~~	160.55$ ~~169.0$~~

NEWEST PRODUCT

Realme C30s	Vivo Y16 64GB	IPhone 14 128GB	Samsung Galaxy A34 5G 128GB
119.0$	194.0$	699.0$	429.0$

(999) 1234 56789
Free support line!

mail@email.com
Free support by mail

Get In Touch 24/7
Live Chat Support

Tphones

Nam Ky Khoi Nghia Street, Hoa Phu Ward, Thu Dau Mot City, Binh Duong Province, Vietnam

0967843879

tuan.la.cit19@eiu.edu.vn

BRAND	WIDGET TITLE	ACCOUNT
Apple	Home	My Account
SamSung	Products	Cart
Oppo	About Us	
Realme	Contact Us	
Vivo		
Xiaomi		

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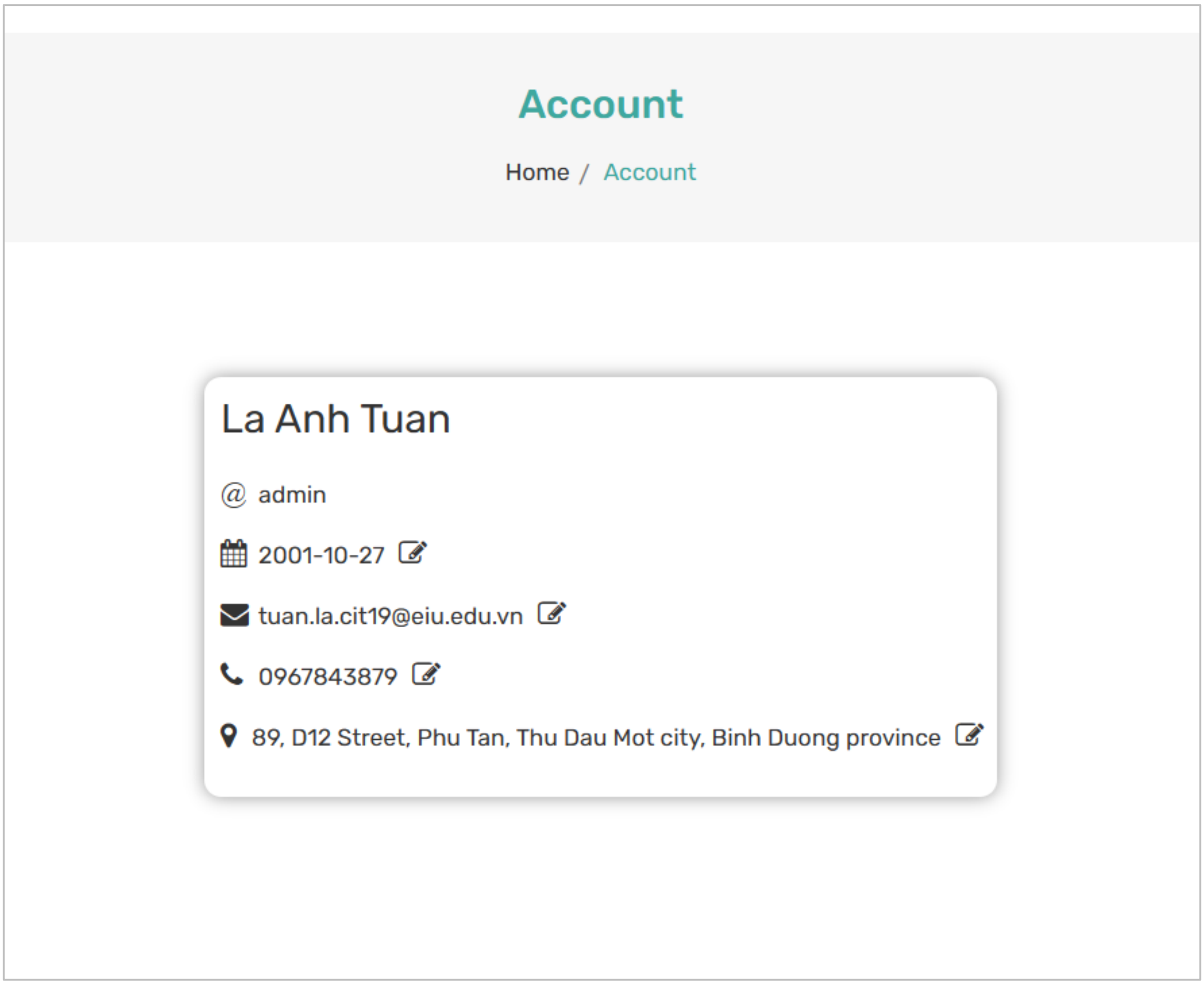
Figure 17: Home Page

4.2.4. Profile Page

In this page, user can see and update their personal information.



La Anh Tuan

@ admin

📅 2001-10-27

✉ tuan.la.cit19@eiu.edu.vn

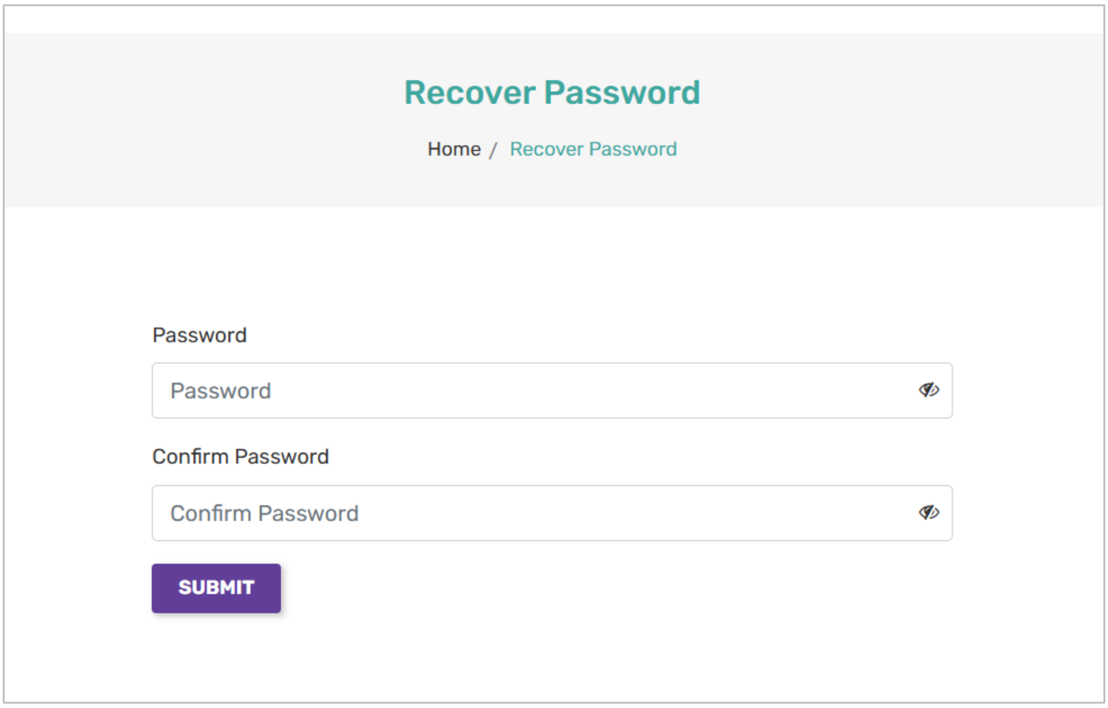
☎ 0967843879

89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province

Figure 18: Profile Page

4.2.5. Reset password page

In this page, user can reset their password.



Recover Password

Home / Recover Password

Password

Password

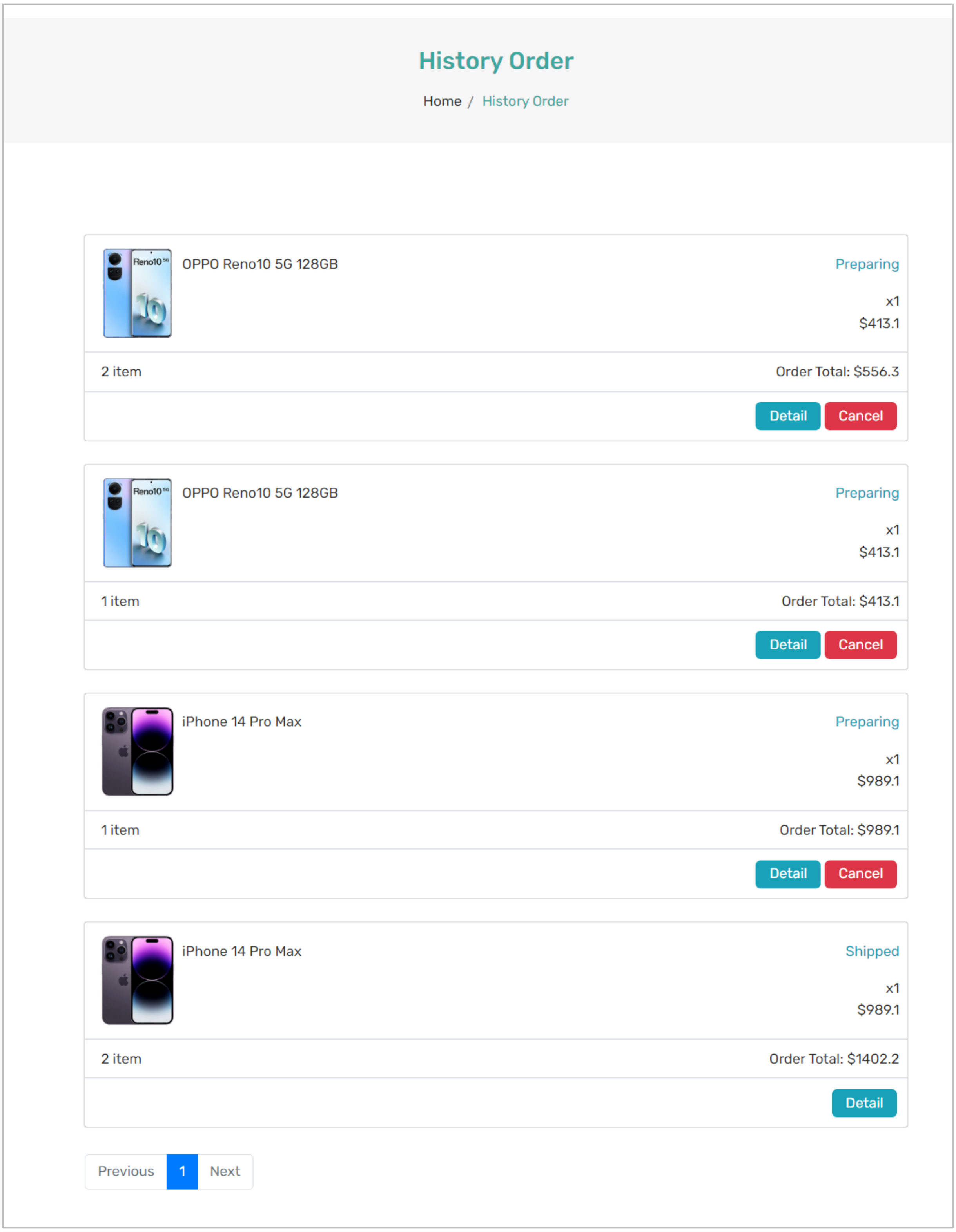
Confirm Password

Confirm Password

Figure 19: Reset password page

4.2.6. History order page

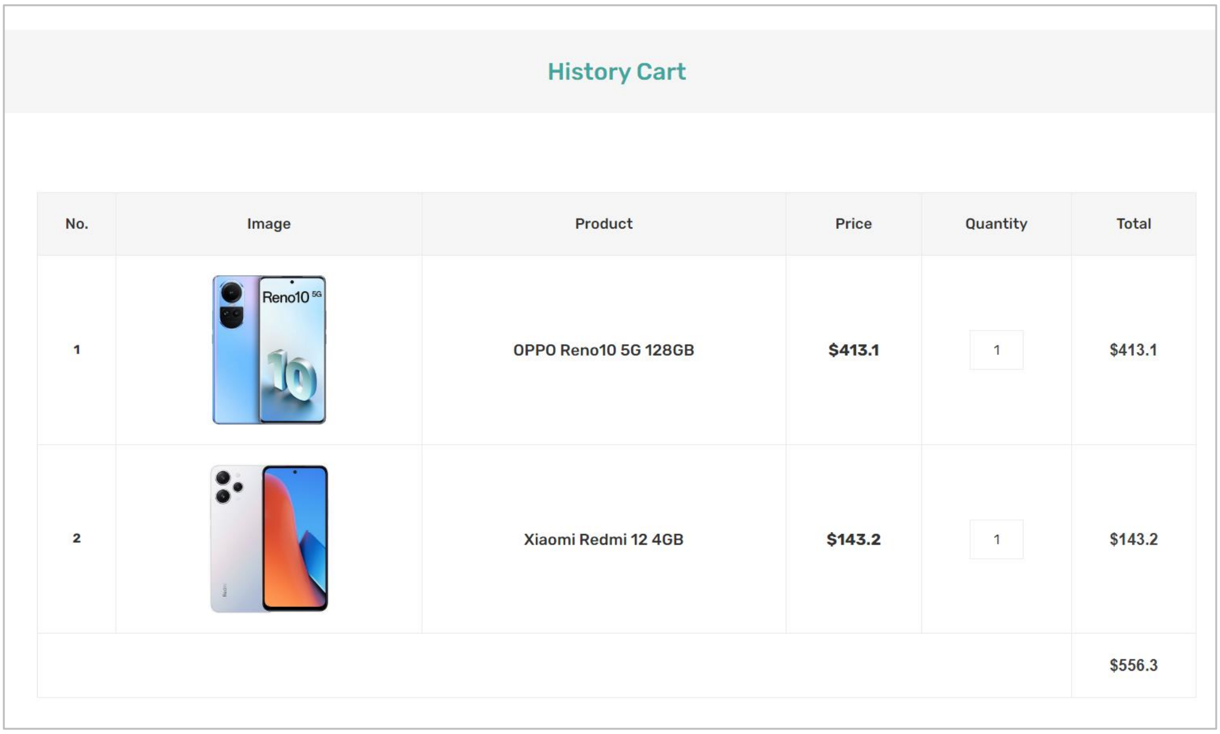
In this page, user can see their orders they have placed.



History Order

Home / History Order

Figure 20: History Order Page



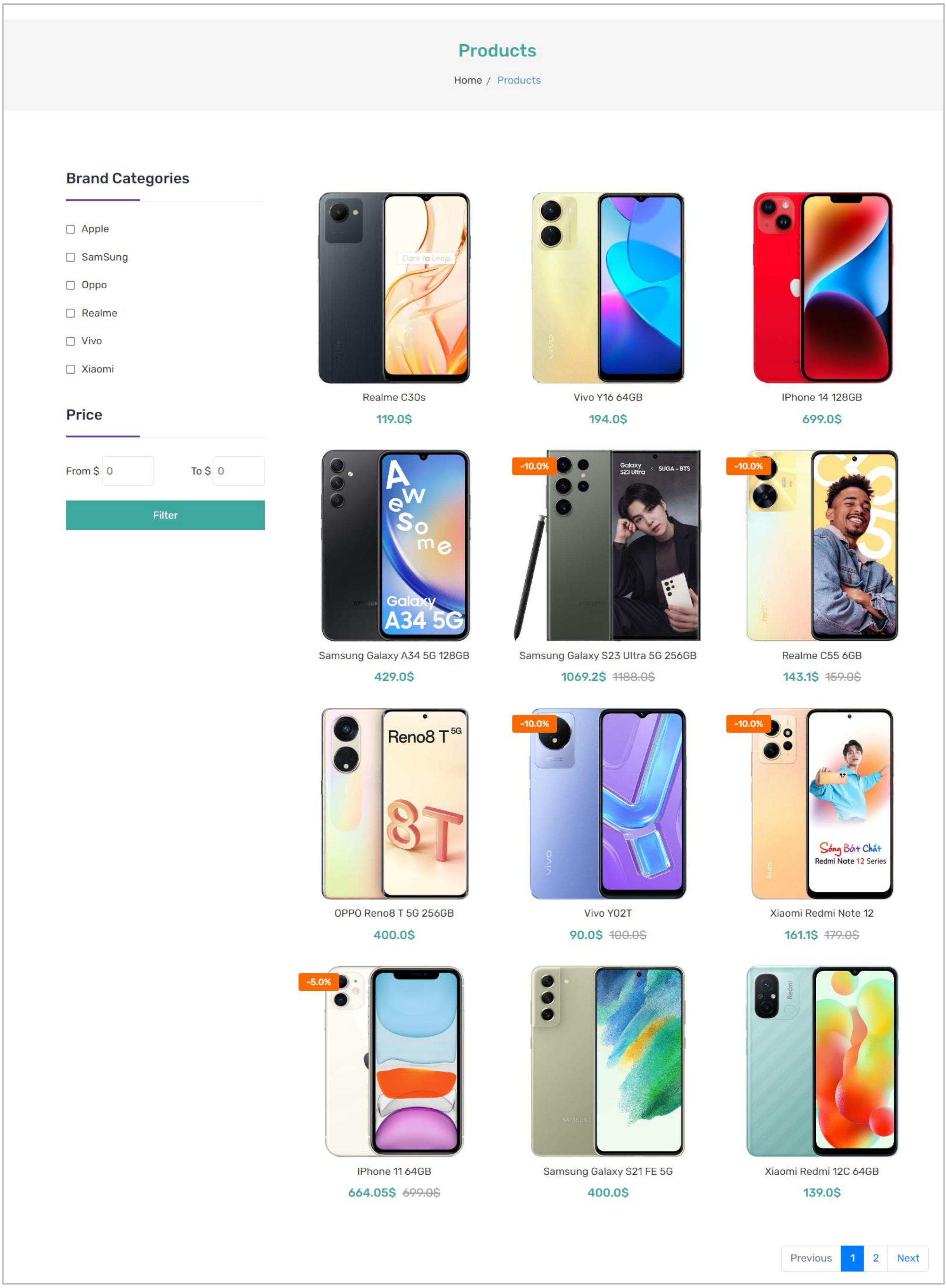
History Cart

No.	Image	Product	Price	Quantity	Total
1	Reno10 5G	OPPO Reno10 5G 128GB	**$413.1**	1	$413.1
2		Xiaomi Redmi 12 4GB	**$143.2**	1	$143.2
					$556.3

Figure 21: History Order Detail Page

4.2.7. Show all products page

In this page, users can view all the products they searched for or filter by brands and prices.



Products

Home / Products

Brand Categories

□ Apple

□ SamSung

□ Oppo

□ Realme

□ Vivo

□ Xiaomi

Price

From $ 0 To $ 0

Filter

Realme C30s
119.0$

Vivo Y16 64GB
194.0$

IPhone 14 128GB
699.0$

Samsung Galaxy A34 5G 128GB
429.0$

-10.0%
Samsung Galaxy S23 Ultra 5G 256GB
1069.2$ ~~1188.0$~~

-10.0%
Realme C55 6GB
143.1$ ~~159.0$~~

OPPO Reno8 T 5G 256GB
400.0$

-10.0%
Vivo Y02T
90.0$ ~~100.0$~~

-10.0%
Xiaomi Redmi Note 12
161.1$ ~~179.0$~~

-5.0%
IPhone 11 64GB
664.05$ ~~699.0$~~

Samsung Galaxy S21 FE 5G
400.0$

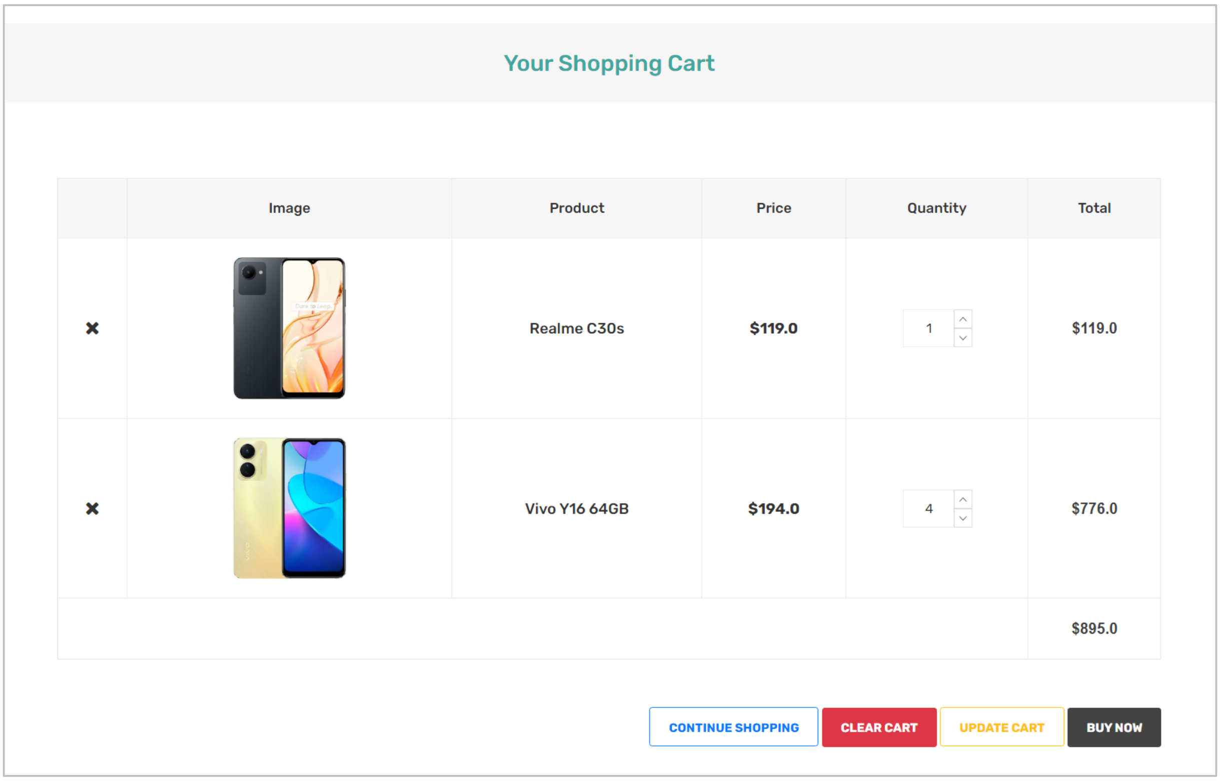
Xiaomi Redmi 12C 64GB
139.0$

Previous 1 2 Next

Figure 22: All Products Page

4.2.8. Cart page

In this page, users can see the shopping cart they just added.



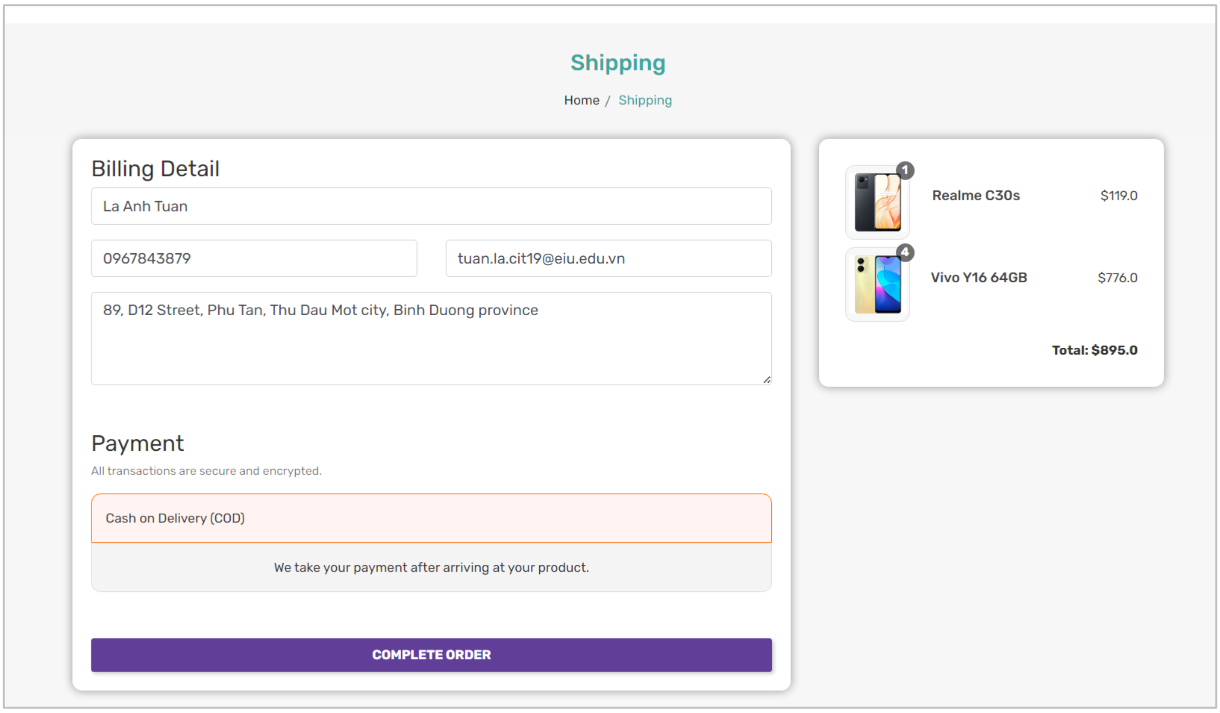
Your Shopping Cart

	Image	Product	Price	Quantity	Total
✖		Realme C30s	$119.0	1	$119.0
✖		Vivo Y16 64GB	$194.0	4	$776.0
					$895.0

Figure 23: Cart page

4.2.9. Shipping page

In this page, users will enter details about the recipient and place the order.



Shipping

Billing Detail

La Anh Tuan

0967843879

tuan.la.cit19@eiu.edu.vn

89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province

Payment

All transactions are secure and encrypted.

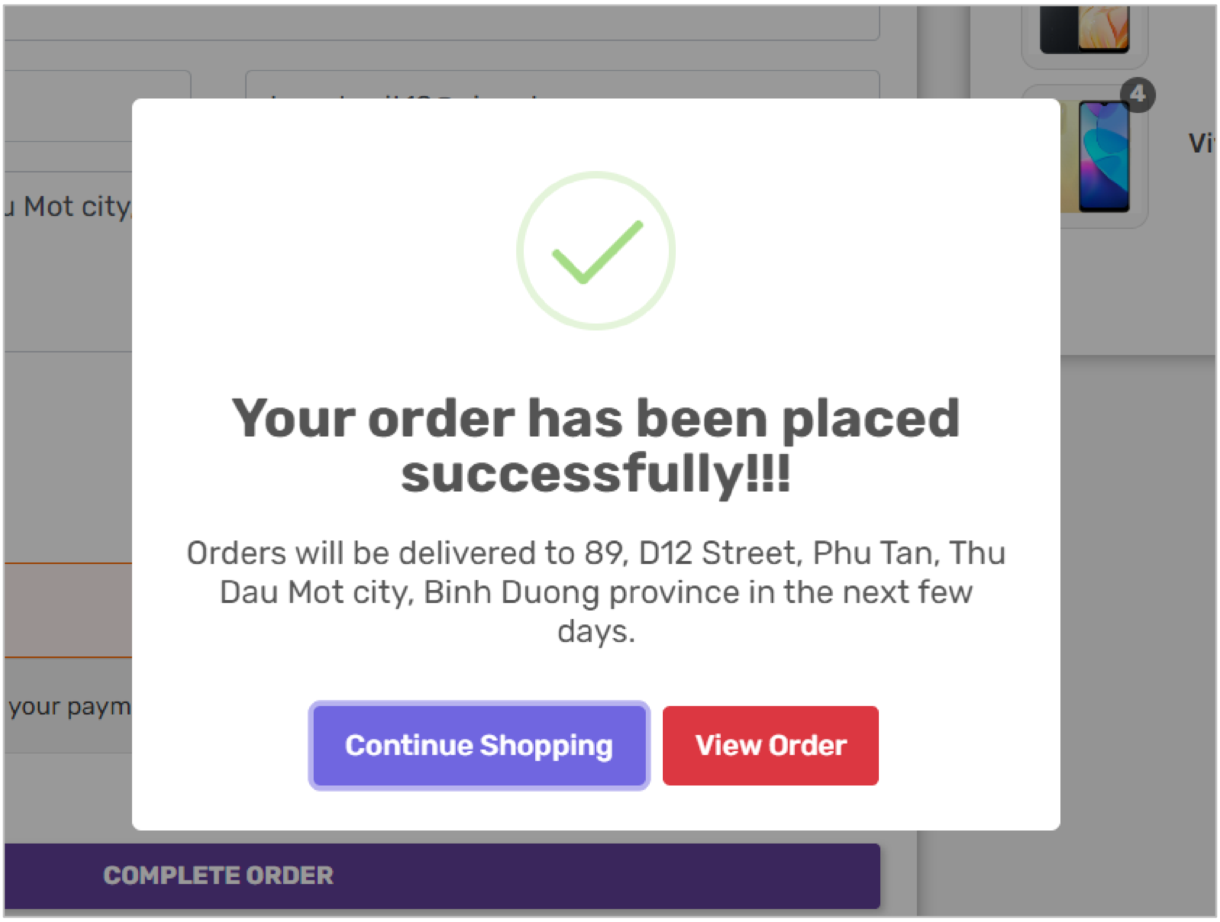
Cash on Delivery (COD)

We take your payment after arriving at your product.

1	Realme C30s	$119.0
4	Vivo Y16 64GB	$776.0

Total: $895.0

Figure 24: Shipping Page



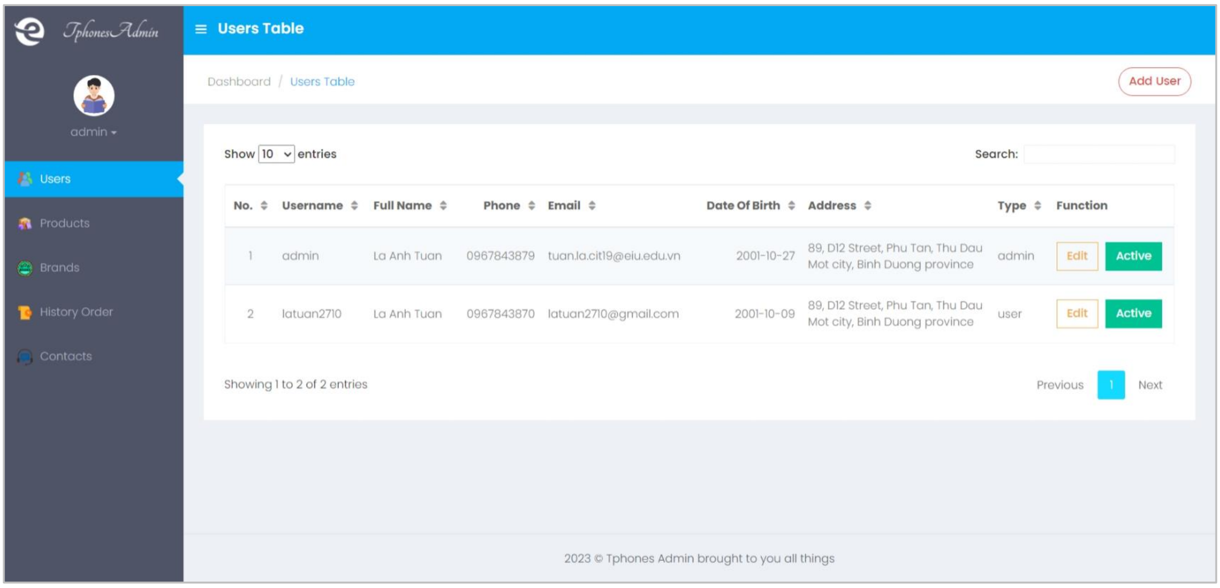
Your order has been placed successfully!!!

Orders will be delivered to 89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province in the next few days.

Figure 25: Notification on the shipping page when the order is successfully placed

4.2.10. Dashboard page

– This page is used to show all users and admin account.



Show 10 entries   Search:

No.	Username	Full Name	Phone	Email	Date Of Birth	Address	Type	Function
1	admin	La Anh Tuan	0967843879	tuan.la.cit19@eiu.edu.vn	2001-10-27	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	admin	Edit Active
2	latuan2710	La Anh Tuan	0967843870	latuan2710@gmail.com	2001-10-09	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	user	Edit Active

Showing 1 to 2 of 2 entries

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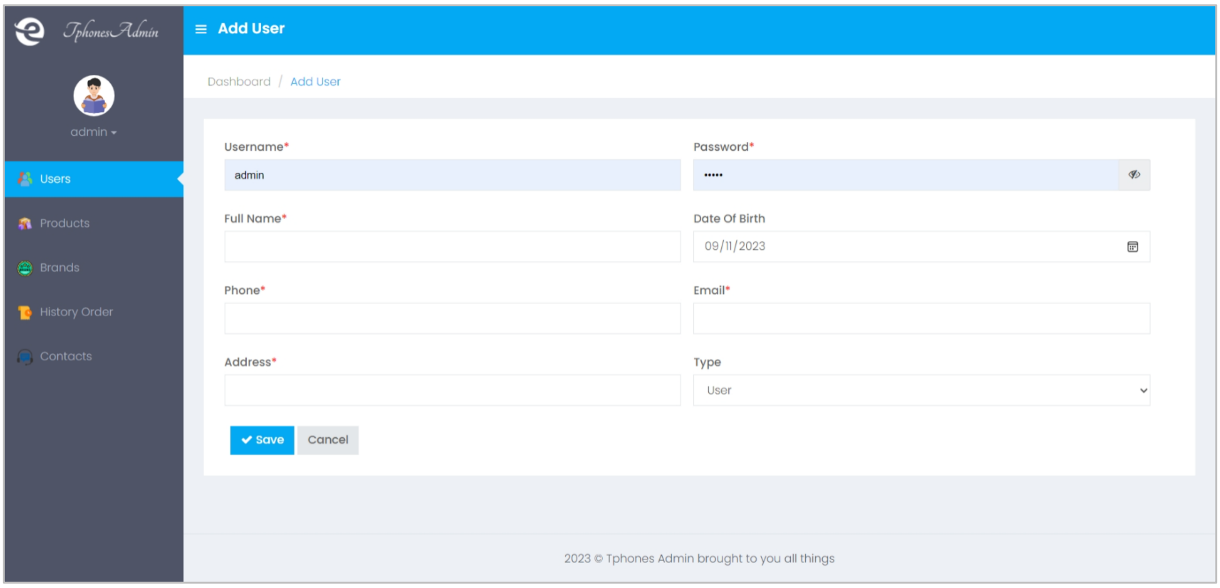
Figure 26: Admin Users Page

– These pages are used to add new user or admin account.



Add User

Username* admin

Password* •••••

Full Name*

Date Of Birth 09/11/2023

Phone*

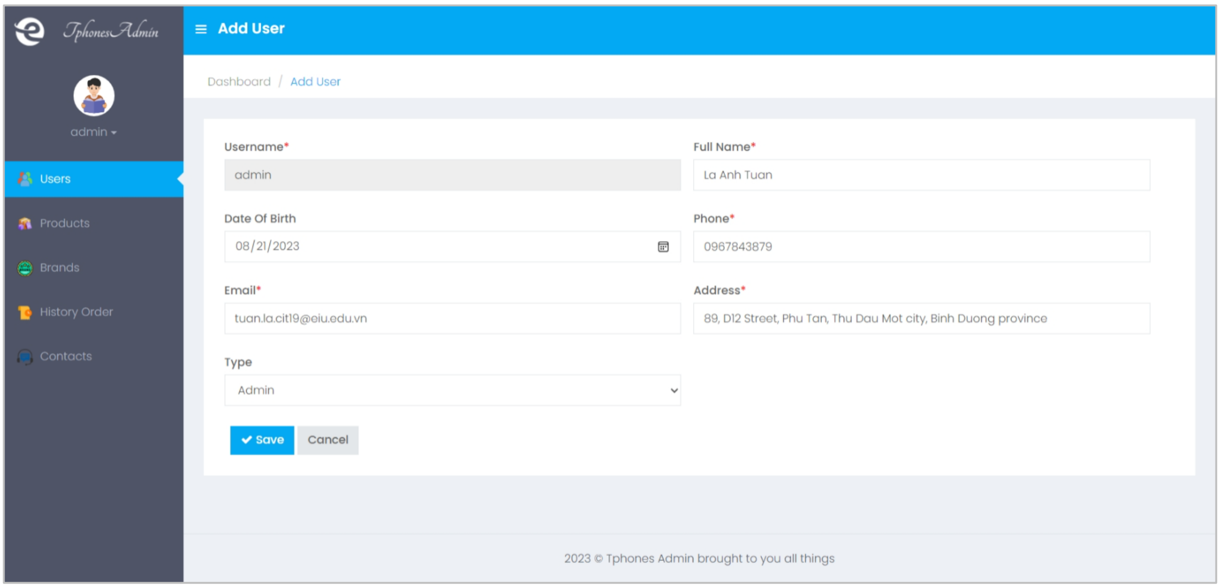
Email*

Address*

Type User

Figure 27: Add user page for admin

- These pages are used to edit user or admin account.



Add User

Username* admin

Full Name* La Anh Tuan

Date Of Birth 08/21/2023

Phone* 0967843879

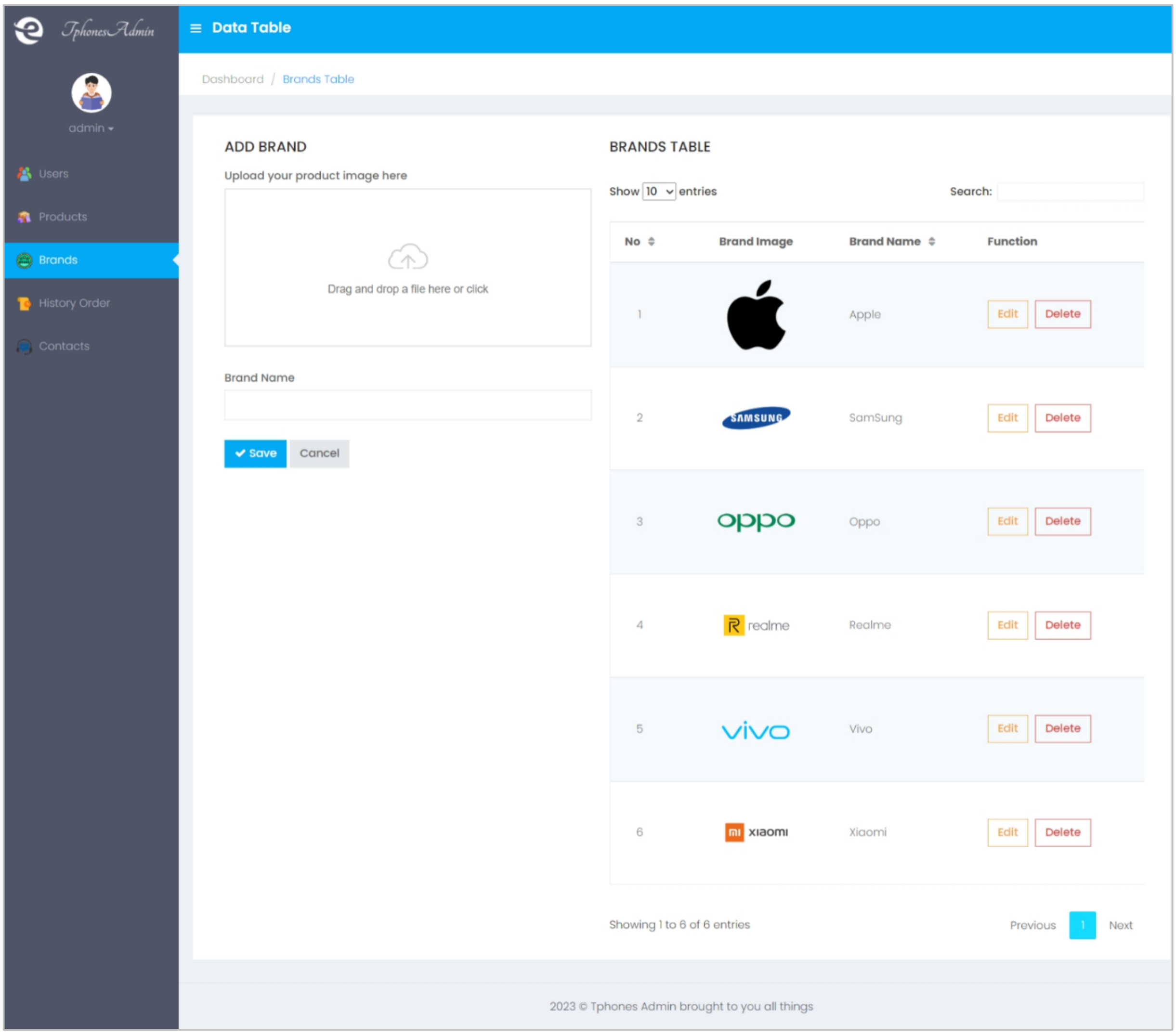
Email* tuan.la.cit19@eiu.edu.vn

Address* 89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province

Type Admin

Figure 28: Edit user page for admin

- This page is used to show brand of product, add and edit brand.



ADD BRAND

Upload your product image here

Drag and drop a file here or click

Brand Name

BRANDS TABLE

Show 10 entries Search:

No	Brand Image	Brand Name	Function
1		Apple	Edit Delete
2	SAMSUNG	SamSung	Edit Delete
3	oppo	Oppo	Edit Delete
4	realme	Realme	Edit Delete
5	vivo	Vivo	Edit Delete
6	mi xiaomi	Xiaomi	Edit Delete

Showing 1 to 6 of 6 entries

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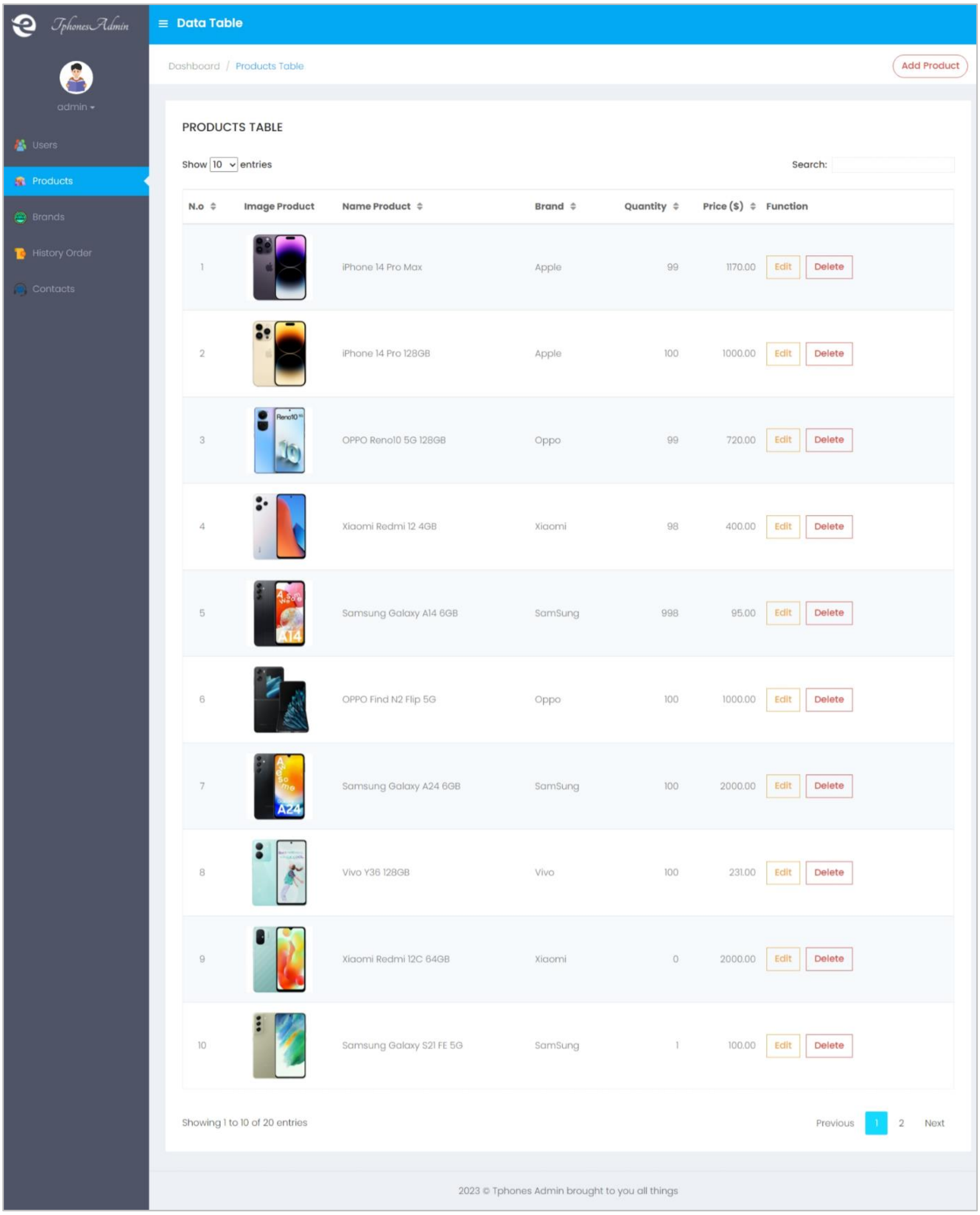
Figure 29: Admin Brands Page

– This page is used to show all products.



PRODUCTS TABLE

Show 10 entries

Search:

N.o	Image Product	Name Product	Brand	Quantity	Price ($)	Function
1		iPhone 14 Pro Max	Apple	99	1170.00	Edit Delete
2		iPhone 14 Pro 128GB	Apple	100	1000.00	Edit Delete
3		OPPO Reno10 5G 128GB	Oppo	99	720.00	Edit Delete
4		Xiaomi Redmi 12 4GB	Xiaomi	98	400.00	Edit Delete
5		Samsung Galaxy A14 6GB	SamSung	998	95.00	Edit Delete
6		OPPO Find N2 Flip 5G	Oppo	100	1000.00	Edit Delete
7		Samsung Galaxy A24 6GB	SamSung	100	2000.00	Edit Delete
8		Vivo Y36 128GB	Vivo	100	231.00	Edit Delete
9		Xiaomi Redmi 12C 64GB	Xiaomi	0	2000.00	Edit Delete
10		Samsung Galaxy S21 FE 5G	SamSung	1	100.00	Edit Delete

Showing 1 to 10 of 20 entries

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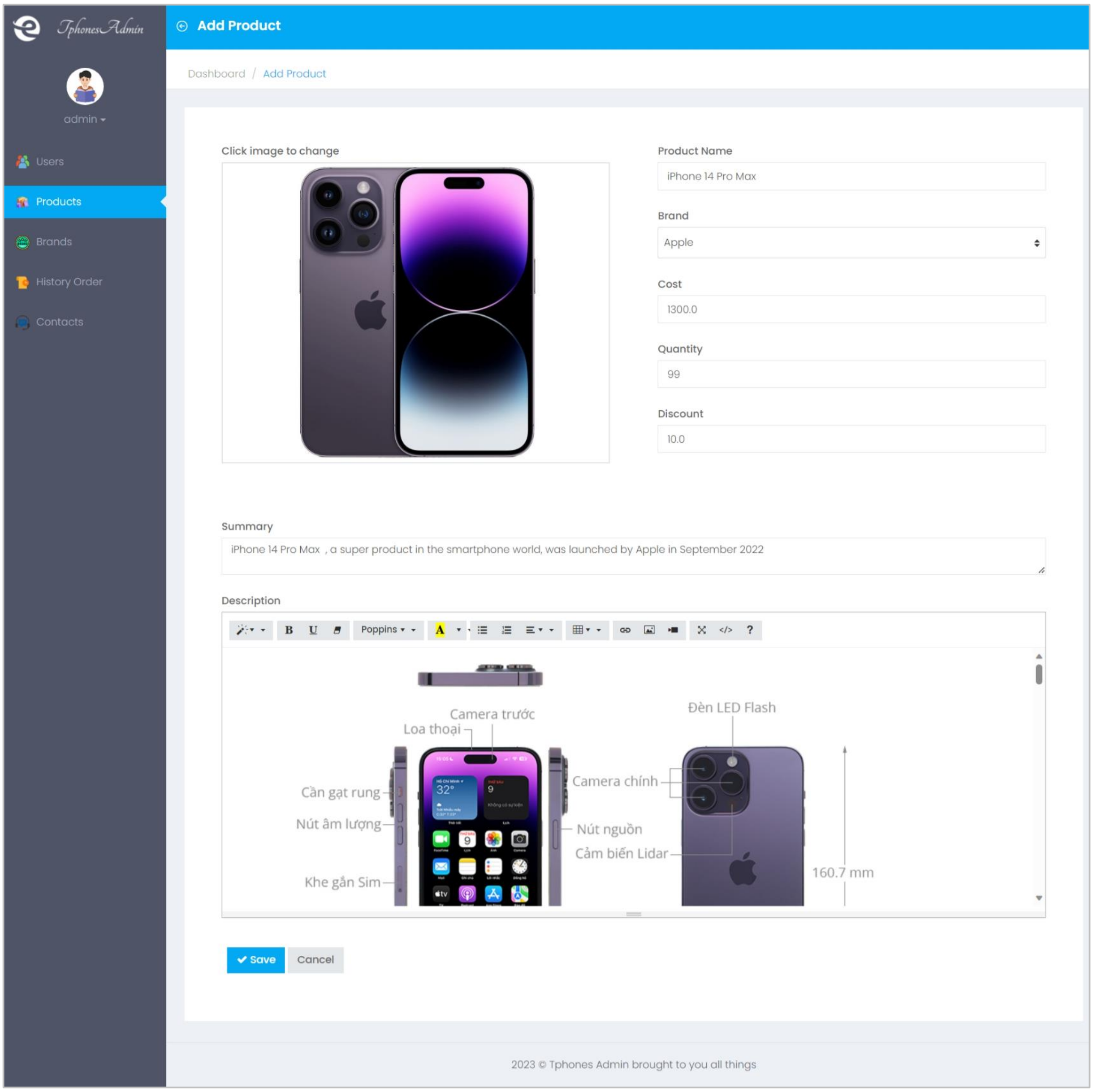
Figure 30: Admin Products Page

- This page is used to add and edit product.



Add Product

Dashboard / Add Product

Click image to change

Product Name: iPhone 14 Pro Max

Brand: Apple

Cost: 1300.0

Quantity: 99

Discount: 10.0

Summary: iPhone 14 Pro Max , a super product in the smartphone world, was launched by Apple in September 2022

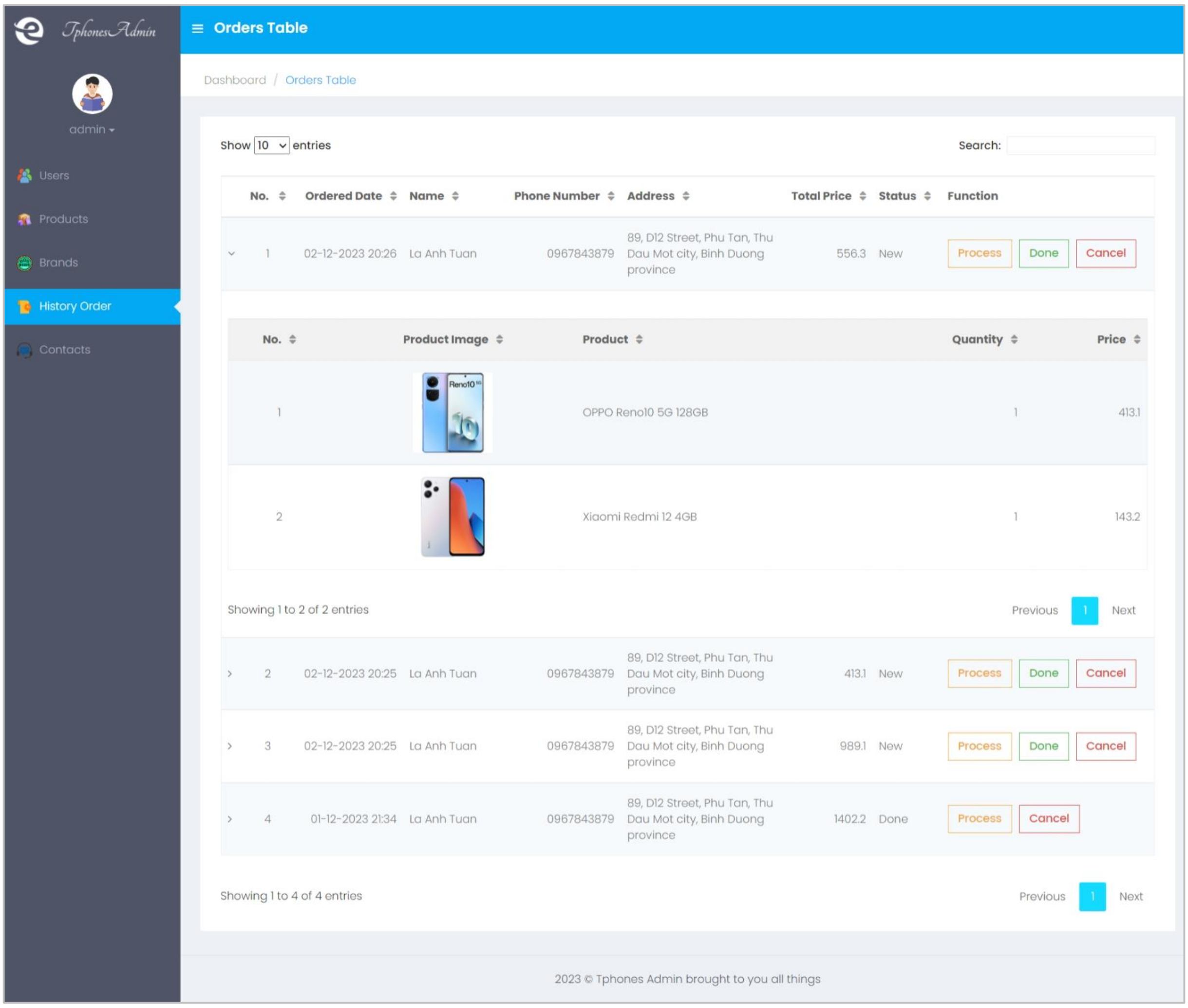
Description

✓ Save Cancel

2023 © Tphones Admin brought to you all things

Figure 31: Add and Edit product page

– This page is used to display all orders the user has placed.



No.	Ordered Date	Name	Phone Number	Address	Total Price	Status	Function
1	02-12-2023 20:26	La Anh Tuan	0967843879	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	556.3	New	Process Done Cancel

No.	Product Image	Product	Quantity	Price
1		OPPO Reno10 5G 128GB	1	413.1
2		Xiaomi Redmi 12 4GB	1	143.2

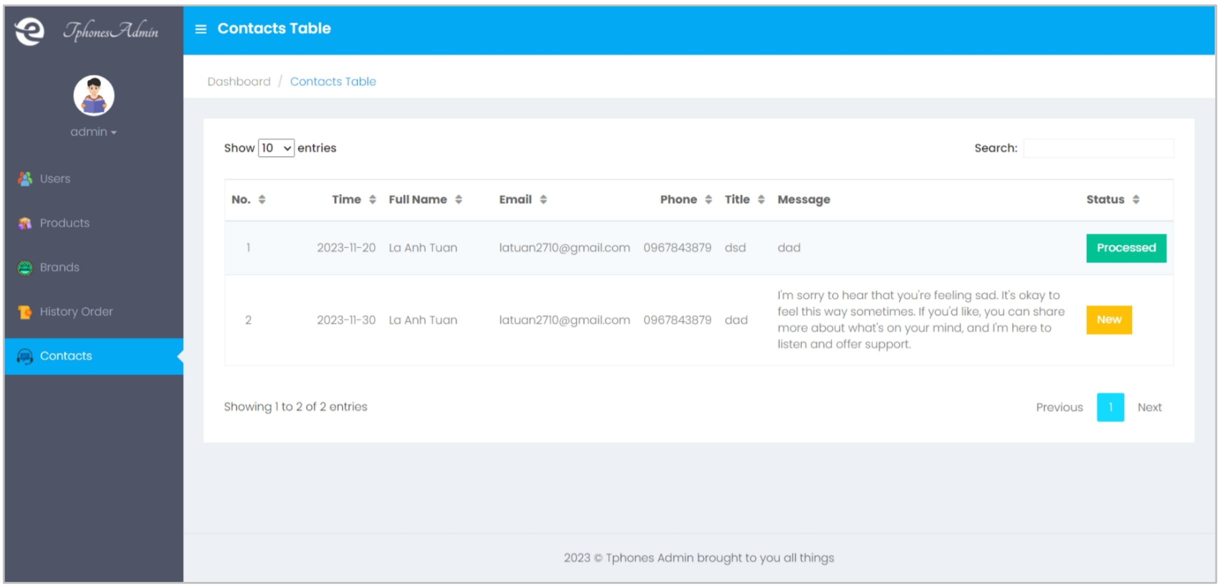
Showing 1 to 2 of 2 entries

No.	Ordered Date	Name	Phone Number	Address	Total Price	Status	Function
2	02-12-2023 20:25	La Anh Tuan	0967843879	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	413.1	New	Process Done Cancel
3	02-12-2023 20:25	La Anh Tuan	0967843879	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	989.1	New	Process Done Cancel
4	01-12-2023 21:34	La Anh Tuan	0967843879	89, D12 Street, Phu Tan, Thu Dau Mot city, Binh Duong province	1402.2	Done	Process Cancel

Showing 1 to 4 of 4 entries

Figure 32: Admin Order Page

- This page is used to display all contacts forms the user has submitted.



No.	Time	Full Name	Email	Phone	Title	Message	Status
1	2023-11-20	La Anh Tuan	latuan2710@gmail.com	0967843879	dsd	dad	Processed
2	2023-11-30	La Anh Tuan	latuan2710@gmail.com	0967843879	dad	I'm sorry to hear that you're feeling sad. It's okay to feel this way sometimes. If you'd like, you can share more about what's on your mind, and I'm here to listen and offer support.	New

Showing 1 to 2 of 2 entries

Figure 33: Admin Contact Page

CHAPTER 5. CONCLUSION AND FUTURE WORKS

5.1. Conclusion

After the implementation process – Tphones Website, I have learnt how to use several new technologies that have been applied to this project, including:

- Spring Boot
- MySQL
- Thymeleaf
- Rich Text Field
- DataTables

The Commercial Website is built using the Java Spring Framework, incorporating Thymeleaf for templates, Bootstrap for CSS styling, and the jQuery framework for enhanced JavaScript functionality. It boasts a responsive design, ensuring a seamless user experience across both desktop and mobile devices. The website encompasses various pages such as the homepage, product showcase, login, registration, password reset, product details, shopping cart, user profile, order history, and dedicated dashboard pages for administrative tasks.

Notable features include comprehensive CRUD operations for managing user accounts, orders, brands, and products. Users have the ability to register, log in, and initiate password recovery processes. Additionally, they can effortlessly navigate through functionalities such as adding items to the cart, placing orders, and modifying personal information. The website facilitates a user-friendly interface, allowing users to keep track of their cart contents and review their order history seamlessly. For administrative purposes, a dashboard is provided for efficient management of user accounts, orders, and product details.

5.2. Future works

In the future, we plan to develop Tphones Website with more features in order to improve the project better such as:

- Features / pages for customers:
  + Adding products to cart for non-logged in users.
  + Sign in through Google account.
- Features for administrators:

  Decentralize power to individuals.

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