**MOUNT KENYA UNIVERSITY**

**SCHOOL OF COMPUTING AND INFORMATICS**

**DEPARTMENT OF INFORMATION TECHNOLOGY for (BIT)**

**PROJECT TITLE: SHOPEASY E-COMMERCE WEBSITE**

**BY: STUDENT NAME**

**STUDENT ID**

**This project documentation submitted in partial fulfilment of requirement for the Mount Kenya**

**University award of BACHELOR OF**

**Information Technology**

**DECLARATION**

I hereby declare that this project report is based on my original work except for citations and quotations

which have been duly acknowledged. I also declare that it has not been previously and concurrently

submitted for any other degree or award at Mount Kenya University

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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ID No.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SUPERVISOR**

I the undersigned do hereby certify that this is a true report for the project undertaken by the above-named student under my supervision and that it has been submitted to Mount Kenya University with my approval

Signature……………………………………………………. Date…………………………….

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# **Chapter 1:**

## 1.1 Project Background

### ****1.1 Introduction****

In recent times, the ecommerce industry has undergone a significant transformation due to advancements in technology and evolving consumer preferences. Traditionally, purchasing various products—including cosmetics, electronics, groceries, and more—required visiting physical stores with often limited selections. However, the rise of online shopping has revolutionized this experience, empowering consumers to explore an extensive range of products from the comfort of their homes.

Despite these advancements, there still exists a gap in the market, especially for customers seeking a wide selection of high-quality products and professional assistance across different regions.

**Shopeasy** aims to bridge this gap by establishing a comprehensive online platform that offers a broad range of product categories while enhancing customer experience through value-added services. Recognizing the importance of personalized shopping and expert guidance, Shopeasy will integrate advanced technologies such as artificial intelligence (AI) to offer chatbot support for tailored product recommendations and customer service. The platform also plans to offer access to experts in categories such as skincare, electronics, fashion, and more, depending on the customer’s needs.

### ****1.2 Problem Statement****

The continued reliance on physical retail stores presents several challenges including time-consuming travel, limited store hours, restricted product availability, and an overall fragmented shopping experience. These issues contribute to inefficiency and inconvenience for the modern consumer who seeks flexibility and variety.

To solve these challenges, **Shopeasy** introduces a user-friendly ecommerce platform that eliminates the need for physical shopping by offering 24/7 access to a wide array of products and support services. This approach intends to transform traditional shopping by delivering convenience, accessibility, and personalized service through a fully digital experience.

### ****1.3 Proposed Solution****

To address the identified problems and gaps, **Shopeasy** will implement the following strategies:

* **Diverse Product Catalog**: A wide assortment of products across multiple categories such as cosmetics, electronics, fashion, household items, and groceries to cater to a broad customer base.
* **Branch-Based Services (Optional)**: While primarily digital, Shopeasy may also establish physical collection or service points across Kenya to support certain categories requiring physical presence (e.g., electronics servicing, beauty consultations).
* **AI-Powered Chatbot**: An intelligent chatbot will assist users in making informed decisions by offering real-time support, personalized product suggestions, and guiding them through the shopping process.
* **Expert Support**: Access to professionals across different product categories (e.g., skincare consultants, electronics specialists) will help customers receive tailored advice.
* **Data Security**: Shopeasy will employ robust security protocols to safeguard user data and ensure safe transactions.
* **24/7 Customer Service**: A dedicated support team will be available around the clock to handle inquiries and resolve issues efficiently.

### ****1.4 Project Objectives****

This project aims to position **Shopeasy** as a leading one-stop ecommerce platform offering a seamless shopping experience across all product categories. The platform will ensure convenience, reliability, and accessibility for users across the region. With an efficient inventory management system, Shopeasy will maintain product availability and avoid issues such as stockouts and overstocking.

In addition, a powerful chatbot will be integrated to enhance customer support and provide guidance throughout the shopping process.

### ****Other Objectives:****

* **Enhance Brand Awareness**: Increase visibility and credibility of Shopeasy through targeted marketing strategies including SEO, social media campaigns, and influencer partnerships.
* **Foster Customer Loyalty**: Implement loyalty programs and personalized offers to encourage repeat business and long-term customer relationships.
* **Improve Website Usability**: Develop a user-friendly, mobile-optimized platform to ensure easy navigation, fast loading times, and seamless checkout experiences.
* **Implement Effective Email Marketing**: Maintain active communication with customers via newsletters, promotional offers, and tailored product updates.
* **Optimize Search Engine Visibility**: Use SEO best practices to improve Shopeasy’s ranking on search engines, increasing organic traffic and discoverability.

### ****1.5 Project Scope****

The proposed Shopeasy system will:

* Be adaptable for various ecommerce needs, including electronics, fashion, groceries, cosmetics, and more.
* Require customer registration to ensure secure and personalized access.
* Offer a convenient online shopping experience with features like free shipping, discount offers, and flexible payment options.
* Integrate an AI-powered chatbot to assist users with queries, guide them through the shopping process, and provide personalized recommendations.
* Provide responsive customer support and assistance through multiple channels, including chat, email, and phone.
* Deliver real-time information on the latest product arrivals, promotions, and category-based suggestions tailored to the user’s preferences.

### ****1.6 Project Justification****

The **Shopeasy** project is driven by the growing demand for a seamless, centralized ecommerce experience that offers variety, convenience, and personalization. By offering a broad product catalog, secure payment methods, expert support, and intelligent automation tools, Shopeasy seeks to address the evolving expectations of modern consumers.

This project is justified by its goal to simplify the shopping process, enhance customer satisfaction, and provide accessible, 24/7 services. With an emphasis on innovation, Shopeasy will empower users with real-time support, expert guidance, and the ability to shop anytime, anywhere.

### ****1.7 Project Risks and Mitigation****

Several potential risks are associated with the Shopeasy platform, and corresponding mitigation strategies are outlined below:

* **Technical Issues**: System downtimes or bugs may affect user experience. Regular maintenance, rigorous testing, and a reliable hosting infrastructure will help mitigate this risk.
* **Data Breaches**: Cybersecurity threats pose a significant risk to any ecommerce platform. Shopeasy will implement strong encryption, secure login mechanisms, and compliance with data protection standards (e.g., GDPR) to protect user data.
* **Negative Reviews or Customer Dissatisfaction**: Poor experiences can impact brand reputation. Shopeasy will actively monitor feedback, respond promptly to issues, and prioritize user satisfaction through transparent policies and responsive support.
* **Inventory and Supply Chain Disruptions**: Product unavailability may lead to customer dissatisfaction. An effective inventory management system and strong relationships with suppliers will be critical for ensuring consistent product availability.

## 1.8 Project Budge

| **Item** | **Description** | **Estimated Cost (Kshs)** |
| --- | --- | --- |
| Infrastructure and Hardware | Servers, networking equipment, and office furniture for operational efficiency. | 100,000 |
| Domain Name | Purchase of domain names for the online platform and associated services. | 2,000 |
| Online Hosting | Web hosting services for the online shop and backend systems. | 5,000 |
| Licensing | Costs associated with acquiring licenses for software and APIs required for the platform. | 5,000 |
| Human Resources | Hiring costs for permanent staff, including salaries, benefits, and recruitment fees. | 150,000 |
| Miscellaneous | Additional expenses such as insurance, legal fees, and other unforeseen costs. | 20,000 |
| Total |  | 282,000 |

## 1.9 Project Schedule

The project schedule includes:

|  |  |
| --- | --- |
| **Task** | **Duration** |
| Research and prototype | **2 weeks** |
| Requirements gathering | **3 weeks** |
| System Design and development | **12 weeks** |
| Testing | **3 weeks** |
| Implementation | **3 weeks** |
| Project evaluation | **3 weeks** |
| Project report | **1 day** |

**Gantt chart**

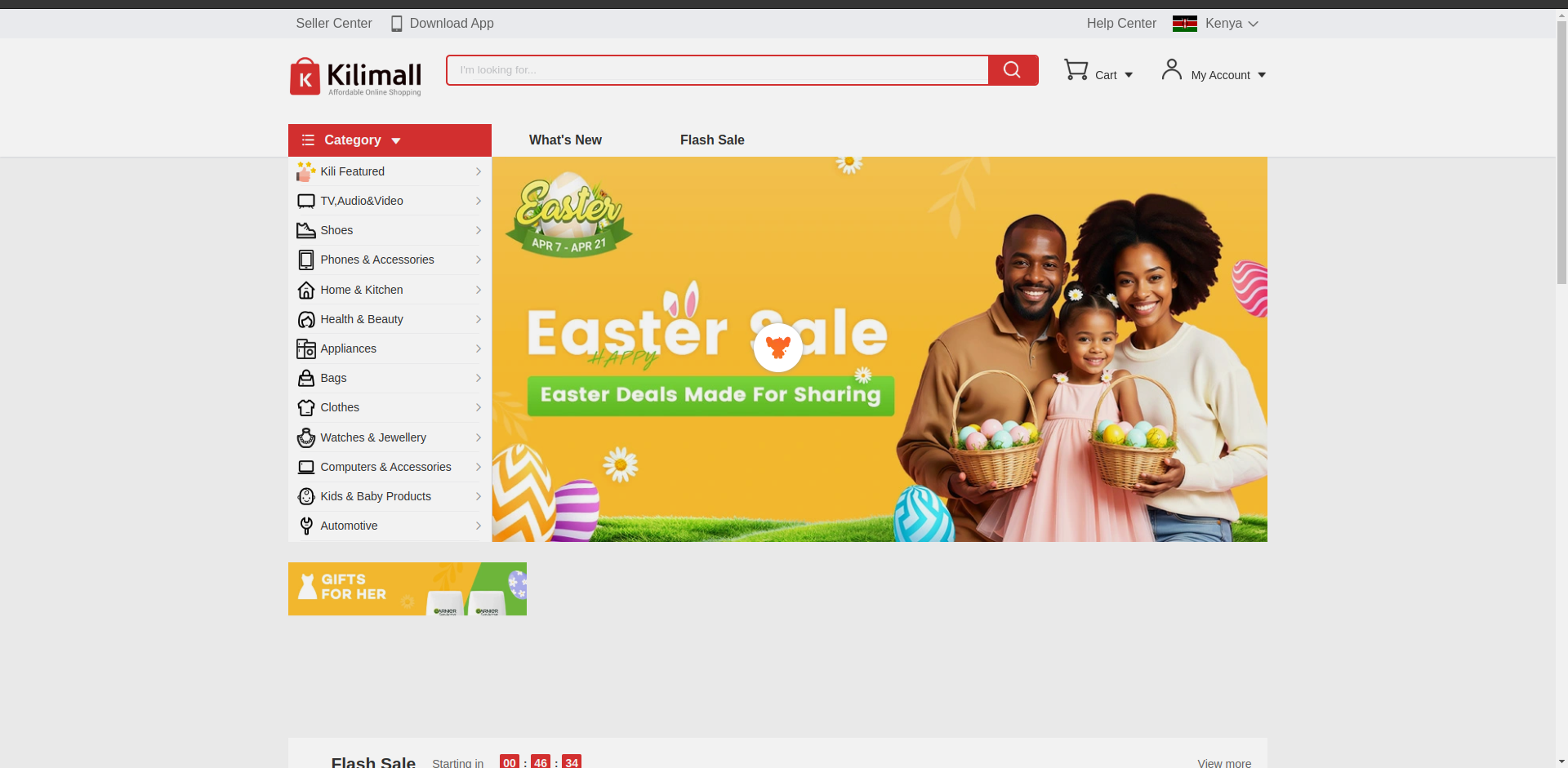
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| weeks | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | DAY |
| Research and prototype Drafting |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Requirements gathering and Data collection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System Design and development |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| testing & User training |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| implementation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Evaluation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# **CHAPTER 2**

## 2.0 Literature review

I worked on some case studies of similar companies and after my research I found some companies with the online cosmetic shop as mine. Let’s take a look at each:

## 2.1 KillMall



Founded in 2014, Kilimall is a leading Kenyan e-commerce platform that offers a wide range of products, including electronics, fashion, home appliances, beauty products, and more. The platform provides an online marketplace where buyers and sellers can engage, offering consumers a diverse selection of goods tailored to their needs. Kilimall has gained significant traction in Kenya and across Africa due to its user-friendly interface, competitive pricing, and convenient delivery services.

However, Kilimall has some drawbacks that affect its overall user experience:

* **Limited Product Availability**: While Kilimall offers a broad range of products, some categories may still have limited availability compared to larger international platforms. This may leave some customers seeking specific items unable to find them on the platform.
* **Delivery Delays**: Kilimall’s delivery times can be inconsistent, especially when dealing with international shipping. While local deliveries tend to be more reliable, international orders may take longer, which can be a disadvantage for customers who expect faster delivery times.
* **Customer Service**: Some customers have reported mixed experiences with Kilimall's customer service. Issues such as delayed responses to inquiries and inconsistent resolutions to problems can lead to customer dissatisfaction.
* **Competition from Larger E-commerce Platforms**: Kilimall competes with both local and international e-commerce giants like Jumia and Amazon, which may have a larger selection of products, better logistics, and enhanced customer service, affecting Kilimall’s market share.

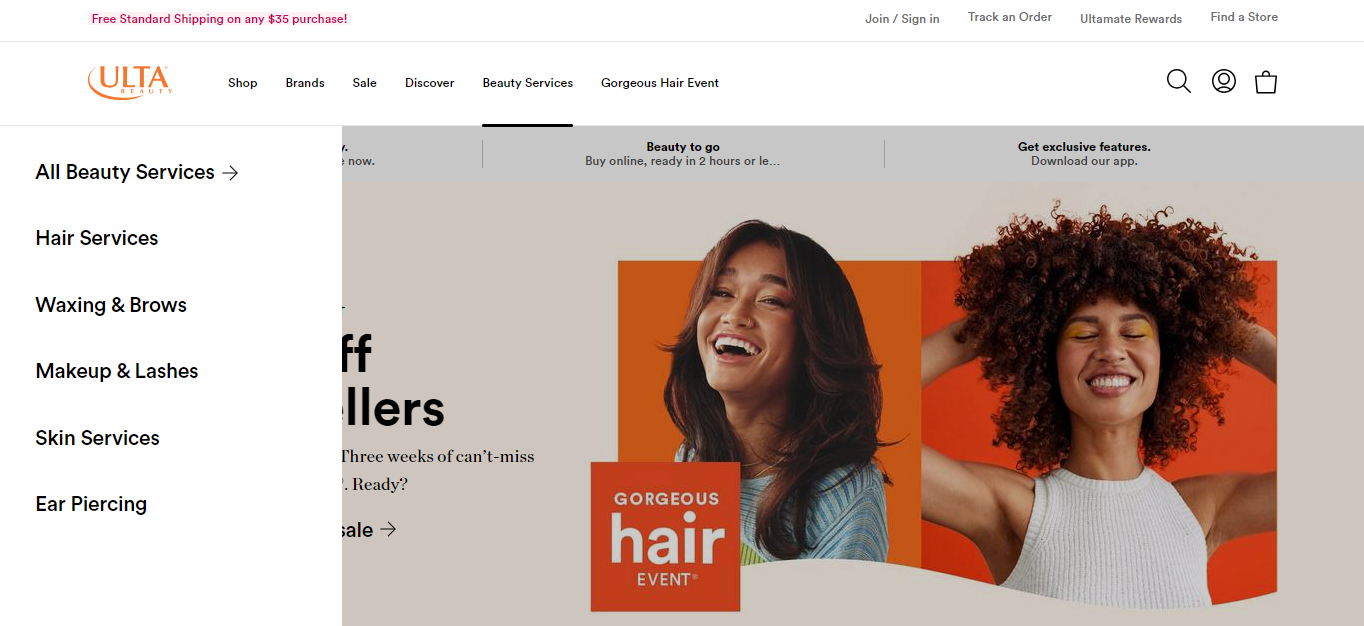
**BeautyConnect Kenya**

Founded in 2015, Beauty Connect Kenya is a pioneering platform that combines both online and offline beauty services, aiming to bridge the gap between professional skincare services and accessible beauty products. Led by Dr. Sarah Onditi, a renowned dermatologist, and Grace Njoroge, a beauty enthusiast and businesswoman, the company operates physical branches across Kenya where they offer a wide array of skincare services such as facials and dermatological consultations. Additionally, Beauty Connect Kenya has an online presence, providing a convenient way for consumers to shop for beauty products. This innovative approach ensures that individuals have access to both professional skincare advice and a broad selection of beauty products, enhancing the overall beauty experience in Kenya.

Despite the strengths of its physical presence for in-person services, Beauty Connect Kenya faces some limitations:

* **Limited Online Selection**: Beauty Connect Kenya's online store may not offer as extensive a selection of beauty products compared to online-only retailers like Kilimall or Jumia. This limitation could be due to a strategic focus on in-person shopping and services, which may not cater to customers who prefer shopping exclusively online.
* **Mixed Customer Experiences**: Some customers have shared varied experiences with both the products and services offered by Beauty Connect Kenya. This could be attributed to:
  1. **Diverse Customer Expectations**: Different customers have different beauty needs, and what works for one person may not work for another, which can lead to mixed reviews.
  2. **Individual Experiences**: Depending on the specific branch visited or the products purchased, customer experiences can vary greatly.
  3. **Product Variability**: There might be inconsistencies in product quality, which could affect customer satisfaction.
  4. **Customer Service**: Delays in response times and issue resolution can negatively impact the customer experience.
  5. **Subjectivity**: Beauty preferences are inherently subjective, influenced by individual factors such as skin type, tone, and personal style.

## 3.Ulta Beauty:



Founded in 1990 by Richard E. George, Ulta Beauty has emerged as one of the largest and most recognized beauty and cosmetics retailers in the United States. Over the years, the company has expanded significantly, establishing a nationwide footprint through its physical stores and a comprehensive online platform. Ulta Beauty stands out as a premier destination for beauty aficionados, featuring an impressive assortment of cosmetics, skincare, haircare, and fragrance products. Its offerings cater to a wide spectrum of beauty requirements and tastes, solidifying its position as a key player in the American beauty industry.

Ulta Beauty is renowned for its vast product selection, including a diverse range of brands, from affordable drugstore options to high-end luxury products. Customers can find everything from makeup and skincare to haircare and perfumes.

In addition to product sales, Ulta Beauty offers professional beauty services in its physical stores. Customers can book appointments for services such as haircuts, facials, and brow waxing, making it a one-stop shop for beauty and self-care. The company's e-commerce platform provides customers with the convenience of shopping for beauty products from the comfort of their homes. The website is user-friendly and allows for easy browsing and product selection.

The company also offers a popular and rewarding loyalty program known as the Ultimate Rewards program, which includes points for purchases, exclusive discounts, and birthday gifts. The online platform includes innovative features like the "Virtual Try-On" tool, which allows customers to virtually test makeup products before making a purchase.

**According to my research, the company faces some drawbacks such us:**

Limited International Shipping-While Ulta Beauty's online platform is accessible to customers worldwide, its international shipping options may be limited compared to other global cosmetics retailers. Some customers may face shipping restrictions or higher costs when ordering from outside the United States.

Price Range-The extensive product range includes high-end and luxury brands, which can be expensive. Some customers may find that Ulta Beauty's offerings, especially the high-end products, come with a higher price point compared to local or budget-friendly alternatives.

Competition-The highly competitive beauty market means that Ulta Beauty has to constantly adapt to changing customer preferences and market trends. Customers may have inconsistent experiences depending on factors such as product availability, quality, and service quality at different locations or through the website.

# **Chapter 3**

### ****3.0 Research Methodology****

This section outlines the methodology adopted for the development of **Shopeasy**, a versatile ecommerce platform aimed at transforming the online shopping experience across multiple product categories. The methodology covers the entire project lifecycle—from initial data collection to system development—ensuring an efficient and user-centric implementation process.

### ****3.1 Research/Development Methodology****

The development of Shopeasy follows the **Agile software development methodology**, known for its flexibility, iterative structure, and emphasis on collaboration. Agile is particularly suited to evolving ecommerce platforms, as it enables continuous improvement based on customer feedback and changing market dynamics.

#### **3.1.1 Principles at Work**

The Shopeasy project is organized into incremental **sprints**, with each sprint focusing on key features such as product management, user interface improvements, payment integration, and customer support enhancements. This approach enables frequent reassessments, early testing, and real-time adjustments based on user and stakeholder feedback, ensuring alignment with expectations and goals.

### ****3.2 Target Audience and User Access****

Shopeasy is built for a wide range of users, including everyday consumers, small business owners, and large-scale buyers across different product categories—such as electronics, fashion, groceries, cosmetics, and home appliances. The platform follows a **convenience sampling technique**, allowing anyone interested in online shopping to access and use the platform freely.

This inclusive approach allows Shopeasy to gather diverse insights from various user groups, which is essential for shaping features, personalizing recommendations, and delivering exceptional service to a broad audience.

### ****3.3 Data Collection Tools & Techniques****

Effective data collection is central to shaping Shopeasy’s user experience and platform capabilities. Various methods will be used to gather both user and product information.

#### **3.3.1 User Registrations**

During registration, Shopeasy collects essential information such as user demographics, shopping preferences, and favorite product categories. This data helps in building personalized user profiles, enhancing recommendations, and tailoring promotional campaigns.

#### **3.3.2 Product Listings**

The platform will compile detailed product information, including high-quality images, detailed descriptions, specifications, prices, availability, seller ratings, and reviews. This information is sourced from verified suppliers and brand partners to ensure credibility and help users make informed purchasing decisions.

#### **3.3.3 Feedback Forms**

User feedback is critical for the continuous improvement of Shopeasy. Customers will be encouraged to provide feedback through review sections, satisfaction surveys, and suggestion boxes. This input will inform decisions related to UI/UX, product quality, delivery efficiency, and overall user satisfaction.

### ****3.4 Data Analysis Tools and Techniques****

To optimize user experience, business performance, and operational efficiency, Shopeasy will implement advanced data analysis techniques.

#### **3.4.1 Data Analytics**

Analytics tools will be used to track user behavior, purchase patterns, product demand, cart abandonment rates, and more. These insights will drive data-informed decisions, allowing for targeted promotions, inventory optimization, and personalized recommendations.

#### **3.4.2 Data Visualization**

Key insights will be presented using intuitive **charts, graphs, and dashboards**, enabling administrators and business analysts to easily interpret data trends. This facilitates strategic planning, market trend tracking, and operational adjustments in real time.

### 3.5 Gathering Facts and Data

To support data-driven decisions and user-centered design, several methods were employed to gather reliable and actionable data:

#### 3.5.1 Surveys

Structured surveys were created to collect both quantitative data (e.g., user demographics, shopping frequency, preferred product categories) and qualitative insights (e.g., user experience feedback, feature preferences).

#### 3.5.2 Interviews

Semi-structured interviews with end users, small business owners, and ecommerce experts were conducted to uncover deeper insights into customer expectations, platform usability, common shopping behaviors, and pain points experienced with existing platforms.

#### 3.5.3 Social Media Monitoring

Platforms such as X (formerly Twitter), Instagram, and Facebook were monitored to identify emerging shopping trends, product demand spikes, and user sentiment. This helped Shopeasy remain responsive to market dynamics and evolving customer preferences.

#### 3.5.4 Direct Engagement with Vendors and Sellers

Interacting directly with product vendors, resellers, and online marketplace professionals provided valuable feedback on inventory management needs, selling experiences, and system expectations. This contributed to a more balanced platform design that caters to both buyers and sellers.

### 3.6 System Development Tools and Techniques

To bring Shopeasy to life, a range of tools and technologies were utilized, ensuring reliability, scalability, and usability:

#### 3.6.1 Database Tools

**SQLite3** was used for lightweight and efficient database management. It handled user accounts, product inventories, transactions, and shopping histories. As a serverless database engine, it was well-suited for fast development and local testing while supporting core ecommerce features such as search, filtering, and personalized content.

#### 3.6.2 Programming Languages and Frameworks

* **Backend**: The backend was developed using **Python Flask**, a lightweight and flexible web framework that facilitated rapid development of RESTful routes and seamless interaction with the database.
* **Frontend**: **HTML**, **CSS**, and **JavaScript** were used to create a responsive and user-friendly interface across desktop and mobile devices.
* **AI Integration**: Python was also used for implementing smart recommendation features and behavioral tracking to enhance the personalized shopping experience.

### 3.7 Testing and Implementation

A comprehensive testing approach ensured Shopeasy’s reliability and functionality prior to deployment:

#### 3.7.1 Unit Testing

Each route, function, and backend logic component was tested independently to verify correct behavior and prevent regressions.

#### 3.7.2 Integration Testing

System components such as user authentication, product management, and the checkout workflow were tested together to confirm proper interaction and data integrity across modules.

#### 3.7.3 User Acceptance Testing (UAT)

Target users, including online shoppers and vendors, tested the platform and provided feedback on usability, features, and performance. Insights from UAT were used to refine the final product before release.

#### 3.7.4 Automated Testing

Where feasible, automated testing tools (e.g., Selenium for UI automation) were considered to validate critical user journeys such as registration, browsing, and order placement. These tests helped ensure consistent performance across future updates.

### 3.8 Data Representation Methods

Shopeasy provides clear and intuitive data visualization tools to help users and administrators make informed decisions:

#### 3.8.1 Tables

Used for displaying structured data such as:

* Product comparisons (price, availability, seller rating)
* Vendor inventory
* Order and transaction history

#### 3.8.2 Charts and Graphs

Visualizations were integrated to illustrate:

* Sales trends over time
* Popular products and categories
* Customer engagement and activity patterns

#### 3.8.3 Dashboards

Interactive dashboards were designed for different user roles:

* **Admins** to monitor platform metrics, traffic, and revenue
* **Sellers** to track sales, inventory, and customer activity
* **Buyers** to view purchase history, recommendations, and personalized offers  
  These dashboards supported real-time updates and customizable widgets for a tailored experience.

# CHAPTER 4

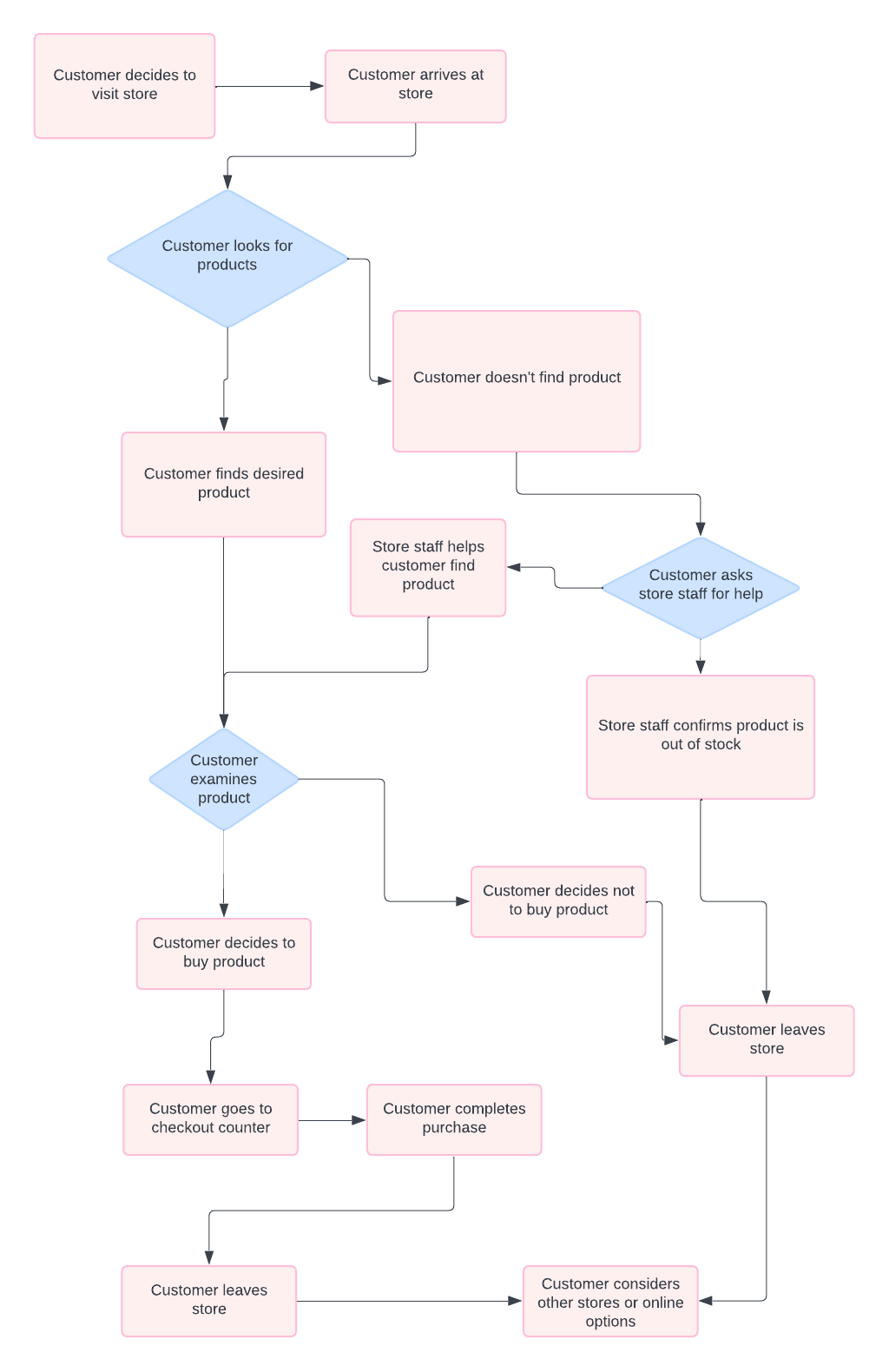
## 4.0 System analysis and requirement modelling

## 4.1 Review of the current system

### 4.1.1 system flowchart

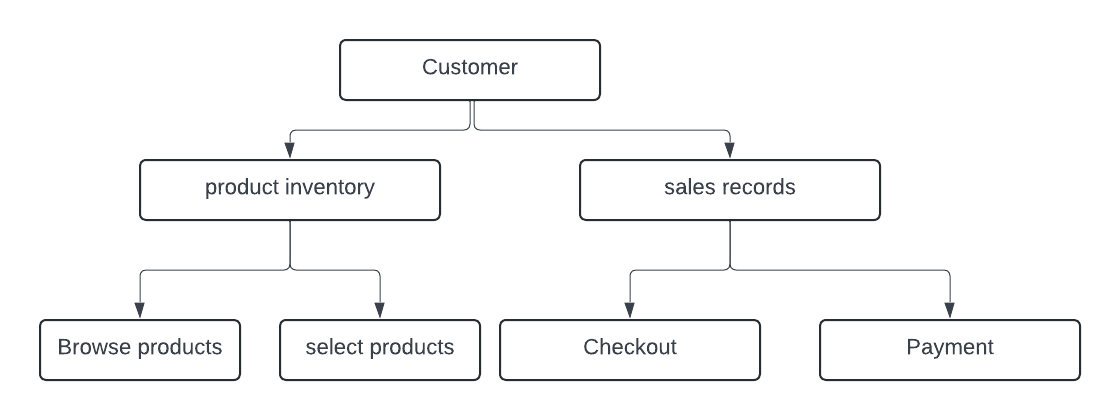
The current system for purchasing cosmetics primarily relies on **physical retail stores**, where customers must be physically present to browse and purchase products. This traditional shopping method presents several challenges, including:

* **Limited Product Availability** – Not all stores stock the full range of cosmetics or latest products.
* **Inconvenience of Travel** – Customers must travel to and from stores, which can be time-consuming.
* **Restricted Operating Hours** – Store hours limit when customers can shop.
* **Lack of Personalization** – Customers do not receive tailored product recommendations or assistance based on their preferences or shopping history.



## 4.1.2 Data Flow Diagram

The diagram below shows the dfd of the current systems.



### ****4.2 Modeling of the Proposed System****

The proposed system, **Shopeasy**, aims to transition the cosmetics shopping experience from a traditional, physical store-based model to a seamless and user-friendly **e-commerce platform**. Shopeasy will serve as an integrated online marketplace where customers can conveniently **browse**, **purchase**, and **receive cosmetics products** from the comfort of their homes.

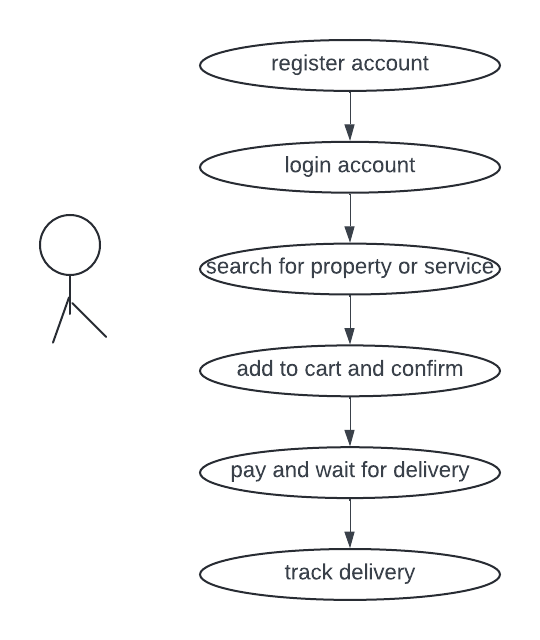
In addition to basic e-commerce functionality, Shopeasy will incorporate **smart features** such as:

* **Personalized product recommendations** powered by AI, based on user preferences, past purchases, and browsing behavior.
* **Interactive product filters** for efficient product discovery.
* **Vendor dashboards** to support product management, order tracking, and performance monitoring.
* **Customer dashboards** for order history, personalized offers, and support access.
* **Secure payment gateways** to ensure safe transactions.

This proposed system aims to enhance customer satisfaction, expand market reach, and provide a modern, data-driven shopping experience that bridges convenience with innovation.

### 4.2.1 Use case diagram for the system

Below is the diagram showing the use case of a client using the website



**4.2.2 Data Flow Diagrams**

**4.2.2.1 Level 0 DFD**  
The Level 0 DFD represents the entire T-ShopEasy e-commerce platform, illustrating its boundary with external entities.

* **User Interface**: This is where users interact with the system, including browsing products, making purchases, managing their accounts, and completing transactions.
* **Database**: The central repository for storing inventory, user data, order histories, transaction records, and product details.
* **External Entities**:
  + **Users**: Customers who interact with the system, searching for products, placing orders, and viewing order statuses.
  + **Third-Party Services**: Payment gateways, shipping providers, or other services integrated into the platform for payment processing and logistics.
  + **Administrators**: Platform administrators who manage products, user accounts, and transactions.
  + **APIs**: External application programming interfaces that may interact with T-ShopEasy for additional functionalities such as recommendations, reviews, or real-time stock updates.

This Level 0 DFD provides a high-level overview of the T-ShopEasy system, showing the key processes and interactions between the system and external entities.

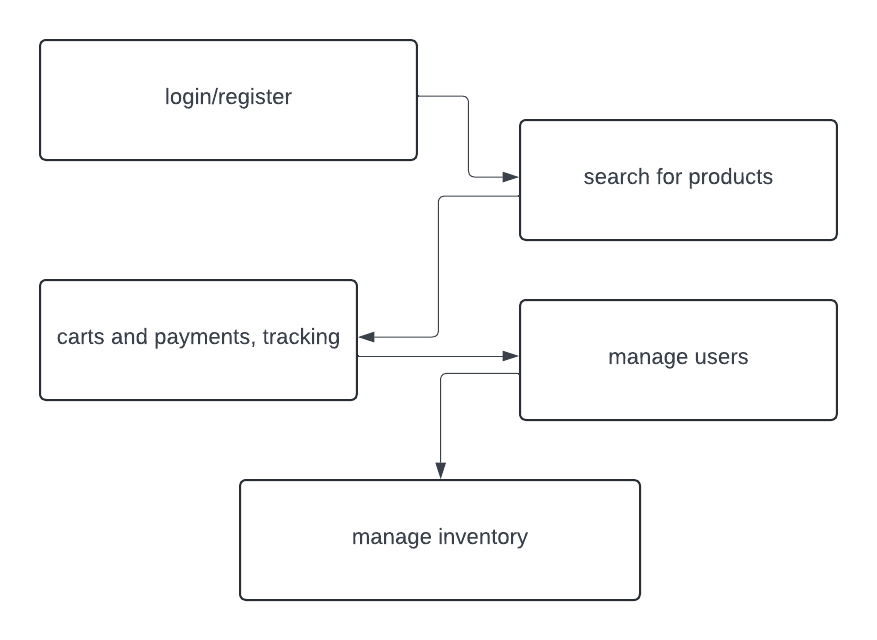
#### 4.2.2.2 level 1 dfd

**User interface:**

User Input: Represents the various inputs provided by users, such as product search criteria, user registration details, etc.

Display Results: Shows the process of displaying products or search results to users.

Manage Users: Represents the functionality related to user management, such as registration, login, and profile management.

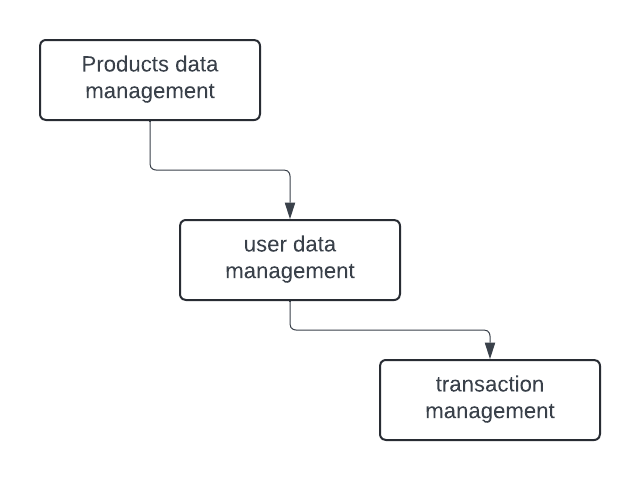


**Database:**

Product Data Management: Handles processes related to managing product data, including adding, updating, and deleting of products.

User Data Management: Manages user-related processes such as adding, updating, and deleting user accounts.

Transactions Management: Deals with recording transactions such as product sales, services sales, and inquiries.



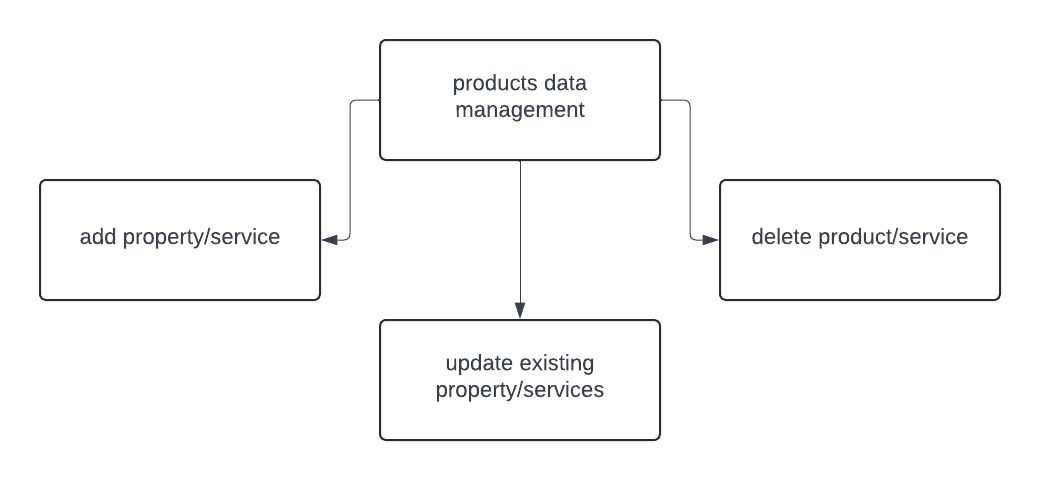
#### **4.2.2.3 level 2 dfd**

**Product data management:**

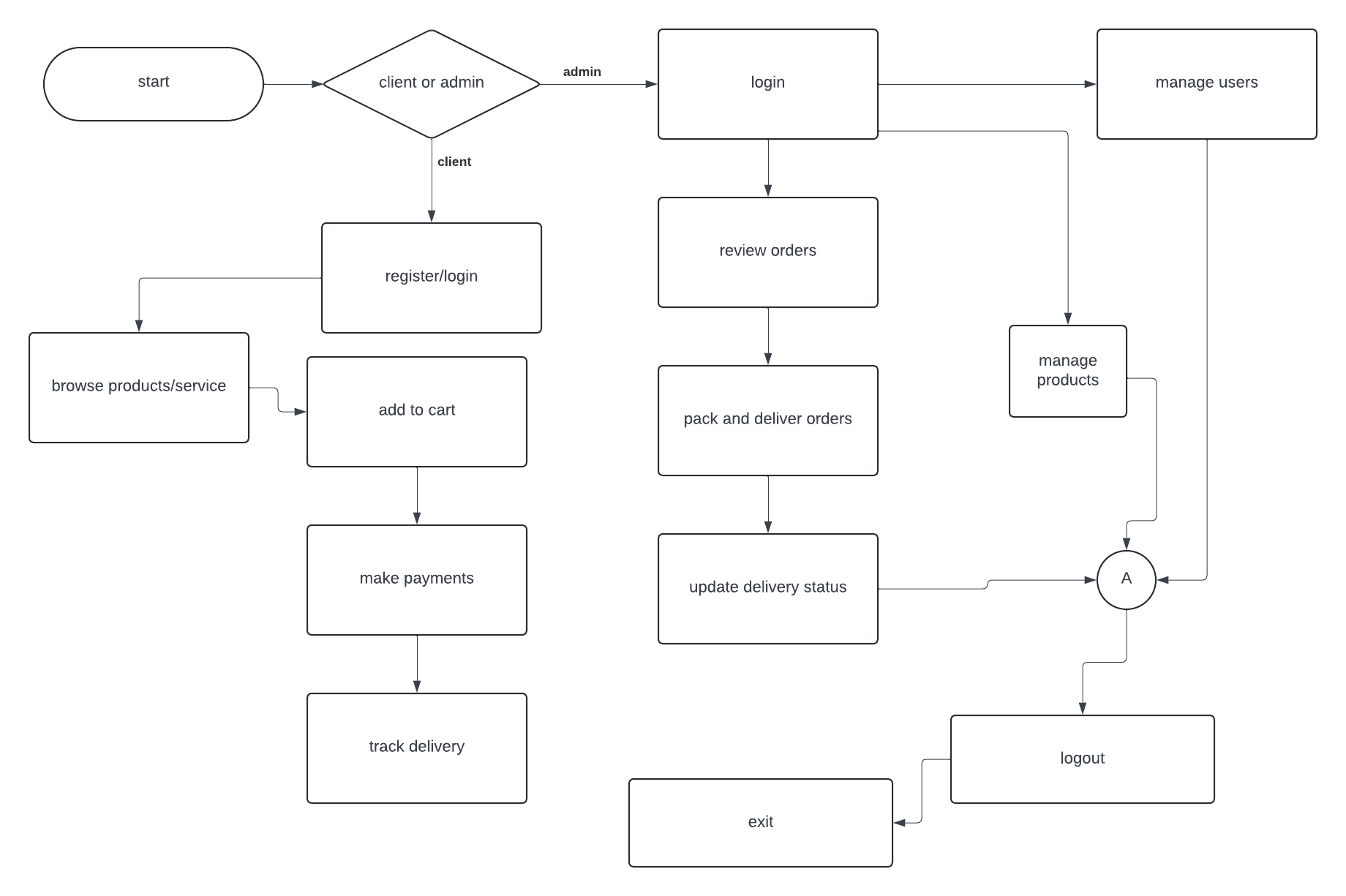
Add Products and services : Process of adding a new products and services to the database.

Update Products and services : Process of updating existing product and services information.

Delete Products and services: Process of removing a properties and services from the database.



## 4.3 system flowchart



## 4.4 system Requirements

### 4.4.1 Functional Requirements

The functional requirements for the ShopEasy E-Commerce platform include:

* User Registration and Authentication:

Users should be able to create accounts and log in securely.

* Product Browsing and Searching: Users should be able to browse and search for products.
* Product Recommendations: The system should provide personalized product recommendations using an AI chatbot.
* Shopping Cart and Checkout: Users should be able to add products to a cart and proceed to checkout.
* Payment Processing and order tracking: The system should support multiple payment methods as well as users should be able to track their orders.

### 4.4.2 Non-Functional Requirements

The non-functional requirements for the system include:

* Availability: The platform should be available 24/7.
* Usability: The interface should be user-friendly and intuitive.
* Performance: The system should handle multiple concurrent users without performance degradation.
* Security: User data and transactions should be secure.

# CHAPTER 5

## 5.0 System Design

## 5.1 Introduction

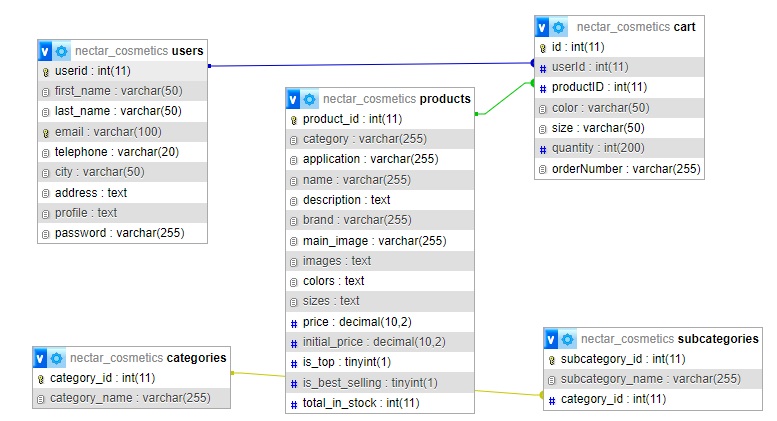
The ShopEasy Online Shop System is a robust software solution designed to facilitate and automate various administrative and operational tasks specific to managing an online cosmetics business. Tailored for cosmetics administrators, sellers, and customers alike, this system aims to optimize efficiency, enhance communication, and ensure smooth operations within the cosmetics retail environment.

## 5.2 Database Design

The database design of the ShopEasy is crucial for efficient data storage, retrieval, and management. It encompasses conceptual, logical, and physical models, providing a structured framework for organizing and accessing product-related information.

### 5.2.1 Conceptual Database Design

The conceptual model illustrates the foundational structure and relationships within the system's database: Below is the conceptual database design of the Nectar Cosmetics:

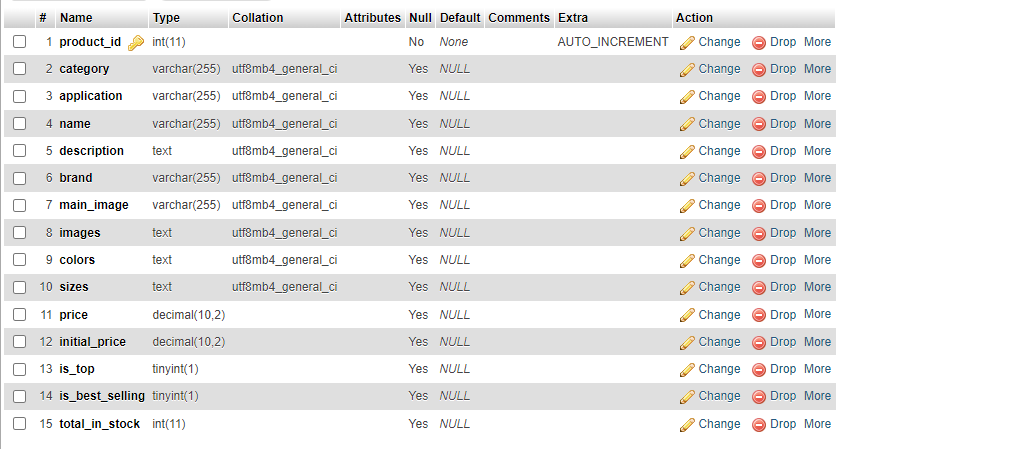


### 5.2.2 Logical Database Design

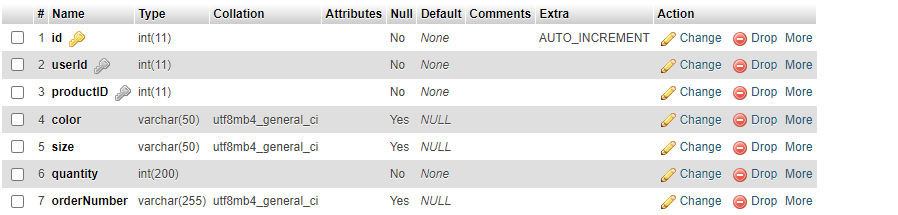
The logical database design of the ShopEasy metics Online Shop System translates the conceptual model into a structured schema implemented within a relational database management system (RDBMS). This design ensures efficient data organization and retrieval tailored to the needs of an online cosmetics store. Below are the figures depicting the system's logical design:

#### 5.2.2.1 products table

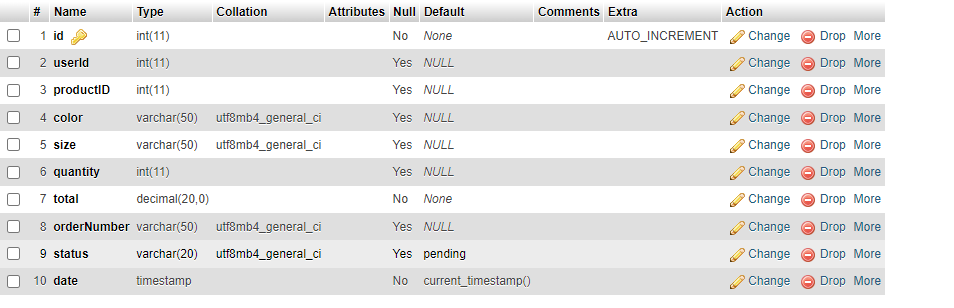
Below is the properties table design which acts as the base factor of the website:



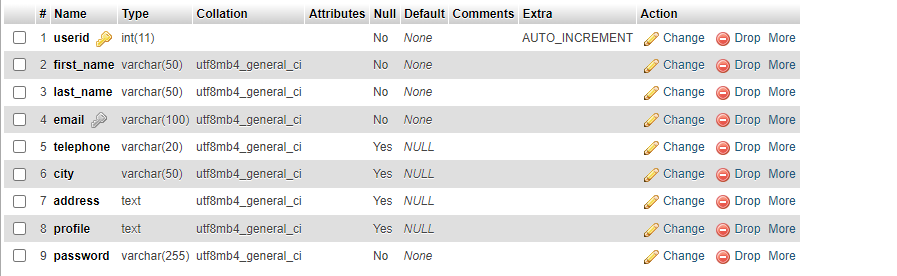
#### 5.2.2.2 carts table



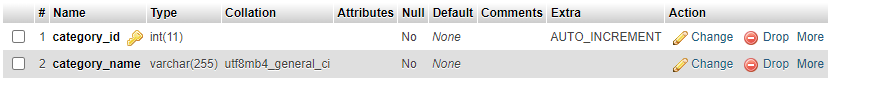
#### 5.2.2.3 orders table



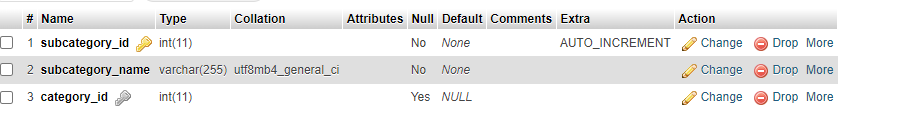
#### 5.2.2.4 Users table



#### 5.2.2.5 categories table



#### 5.2.2.6 sub-categories table

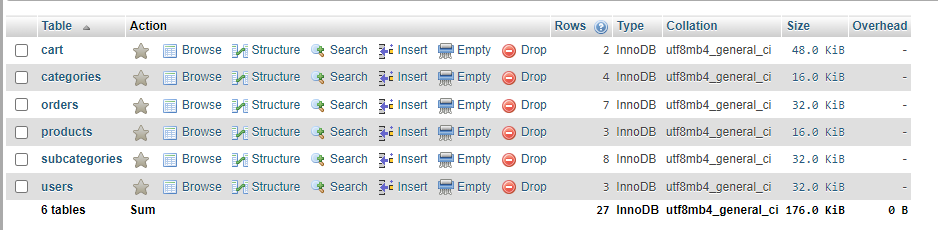


### 5.2.3 Physical Database Design

The physical database designs for the system are outlined below:

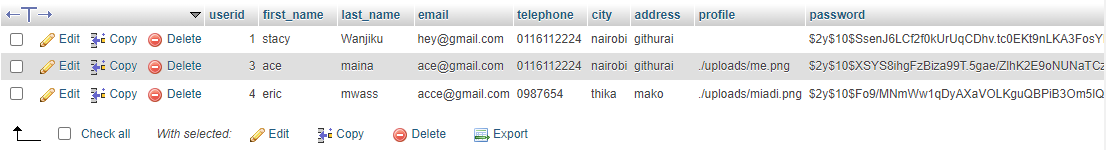
#### **5.2.3.1 Overall Database**

The overall design comprises all tables within the database, named Nectar\_cosmetics:



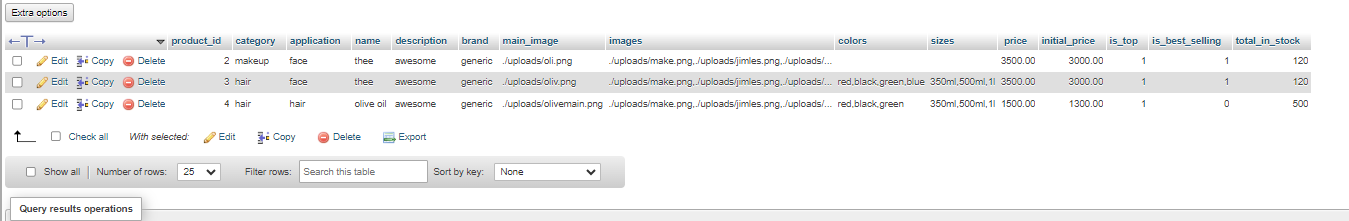
#### **5.2.3.2 users Table**

This stores all information of our clients.



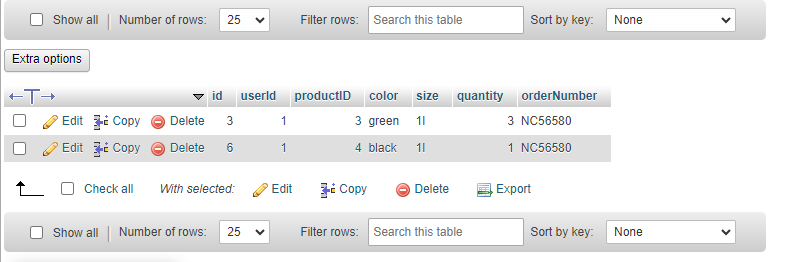
#### **5.2.3.3 Products Table**

This stores all information of all products.



#### **5.2.3.4 cart Table**

This stores all information about user carts.



## 5.3 Design Interface

The user interface (UI) of the ShopEasy Online Shop System is meticulously designed to deliver a seamless and engaging experience for administrators and customers, ensuring ease of navigation and accessibility.

### 5.3.1 System Features

* **Index Page**: The index page serves as the virtual storefront, featuring a visually appealing layout that highlights new arrivals, seasonal promotions, and best-selling products. It includes carousel sliders showcasing featured products, dynamic banners for special offers, and sections for quick links to categories such as skincare, makeup, and fragrance.
* **Login Functionality**: The login interface provides a secure gateway for users to access their accounts. Registered customers can log in to manage their orders, view order history, update personal information, and track shipment statuses. New visitors are prompted to register, guiding them through a straightforward sign-up process to create accounts seamlessly integrated with social login options.
* **Feedback and Contact**: To facilitate customer engagement, the system incorporates a user-friendly feedback mechanism and contact form. Customers can submit inquiries, provide feedback on products or services, and request assistance. Feedback forms include rating options and text fields for detailed comments, enhancing communication between customers and support staff.
* **Reviews**: Product pages prominently display customer reviews and ratings, empowering prospective buyers with insights from previous customers. Reviews are structured with star ratings, user-generated comments, and optional photo uploads, fostering transparency and trust in product quality.
* **Admin Login**: Administrators access a dedicated admin panel via a secure login portal. The admin dashboard provides comprehensive control over backend operations, including product management, inventory tracking, order processing, and customer relationship management (CRM) tools. Administrative privileges ensure data security and operational oversight across the platform.
* **Admin Statistics Analysis Tools**: Built-in analytics tools empower administrators with actionable insights into business performance. Comprehensive dashboards present key metrics. Customizable reports and visualizations facilitate data-driven decision-making, enabling administrators to optimize marketing strategies, stock levels, and product offerings.

### 5.3.2 Design Principles and Considerations

* **Consistency**: The UI design maintains consistent branding elements, color schemes, typography, and navigation structures throughout the platform. Consistency enhances user recognition, usability, and overall brand perception across different pages and interactions.
* **Accessibility**: The system adheres to accessibility guidelines (e.g., WCAG) to ensure inclusivity for users with disabilities. Accessibility features include keyboard navigation support, alt-text for images, resizable fonts, and contrast adjustments, enhancing usability and compliance with accessibility standards.
* **Feedback and Confirmation**: Interactive elements throughout the UI provide real-time feedback and confirmation messages. Users receive notifications for successful actions (e.g., order confirmation, form submission), error alerts (e.g., invalid login attempts), and prompts for further actions (e.g., completing a profile update). Clear and concise messaging enhances user understanding and reduces ambiguity during interactions.
* **Ease of Navigation**: Intuitive navigation menus, breadcrumb trails, and contextual links facilitate seamless transitions between pages and sections. Navigation elements are logically organized, prioritizing primary actions such as browsing products, searching inventory, adding items to carts, and proceeding to checkout. A user-centric approach minimizes cognitive load and optimizes user engagement across the online shopping journey.

# CHAPTER SIX:

**6.0 System Implementation**  
This chapter details the implementation phase of the T-ShopEasy e-commerce platform, covering the tools used for coding and testing, the system test plan, testing procedures including data used and approach, and proposed change-over techniques.

**6.1 Tools Used for Coding and Testing**  
The development of the T-ShopEasy e-commerce platform relied on robust technologies chosen for their versatility and compatibility with web development standards:

* **PHP**: Used for server-side scripting to handle dynamic content and interactions, including order processing and user authentication.
* **JavaScript**: Implemented for client-side interactivity, enhancing the user experience through dynamic features like product filtering, interactive carts, and payment processing.
* **HTML and Bootstrap CSS**: Utilized for structuring and styling the user interface, ensuring responsive and visually appealing layouts across devices, from mobile phones to desktop screens.

For testing purposes, a combination of manual and automated testing tools was employed:

* **Manual Testing**: Conducted by the development team to identify and resolve issues or bugs in the code. It involved testing functionalities like product browsing, checkout process, and user registration.
* **Automated Testing Tools**:
  + **PHPUnit**: Used for backend testing to verify the functionality of server-side logic and database interactions.
  + **Jasmine**: Used for frontend testing to validate JavaScript functionalities, including user interactions like adding products to the cart or submitting orders.

**6.2 System Test Plan**  
A comprehensive system test plan was formulated to validate the functionality, performance, and reliability of the T-ShopEasy e-commerce platform:

* **Scope**: Defines the extent of testing across various modules and features, including the product catalog, user account management, shopping cart, payment gateway, and order processing.
* **Test Scenarios**: Outlines various scenarios under which the system’s functionalities are tested. This includes:
  + User registration and login
  + Product search and filter
  + Checkout and payment
  + Order status tracking
* **Test Cases**: Detailed steps to execute tests and expected outcomes for each scenario. Each test case is structured with:
  + Pre-conditions (e.g., logged-in user)
  + Actions (e.g., selecting products, adding them to the cart)
  + Expected outcomes (e.g., successful payment and order confirmation)
* **Success Criteria**: Criteria that determine whether a test case passes or fails. These include functional accuracy, performance benchmarks, and security standards.

**6.3 Testing Procedure**  
The testing phase involved thorough validation of the system's components:

* **Unit Testing**: Ensured individual modules, such as user registration, product search, and payment processing, functioned correctly in isolation.
* **Integration Testing**: Validated interactions and compatibility between different modules, ensuring that functionalities like adding products to the cart and completing the checkout process work seamlessly together.
* **User Acceptance Testing (UAT)**: Involved real users to evaluate usability, effectiveness, and alignment with user needs. This phase provided valuable feedback on user interface design and overall shopping experience.
* **Performance Testing**: Evaluated system performance under varying load conditions, ensuring that the platform can handle high traffic during peak shopping times like sales or holidays.
* **Security Testing**: Identified and addressed potential security vulnerabilities, ensuring that user data and payment transactions are securely handled with encryption and other security measures in place.

## 6.4 Test Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test Case ID | Description | Input | Expected Output | Actual Output | Pass/Fail |
| **TC\_001** | Login with valid credentials | Username: user1, Password: password1 | Redirect to user dashboard | Redirected | Pass |
| **TC\_002** | Login with invalid credentials | Username: invaliduser, Password: invalidpass | Display error message "Invalid credentials" | Error message | Pass |
| **TC\_003** | Search for products | Using OrderNumber,name | Display order | List of products under the order | Pass |
| **TC\_004** | Add a new product | Product details: Name: Lipstick, Price: $10 | Product added successfully | Product added | Pass |
| **TC\_005** | Update existing product information | Product ID: 101, Updated Price: $12 | Product details updated successfully | Updated product | Pass |
| **TC\_006** | Remove a product | Product ID: 101 | Product removed successfully | Product removed | Pass |

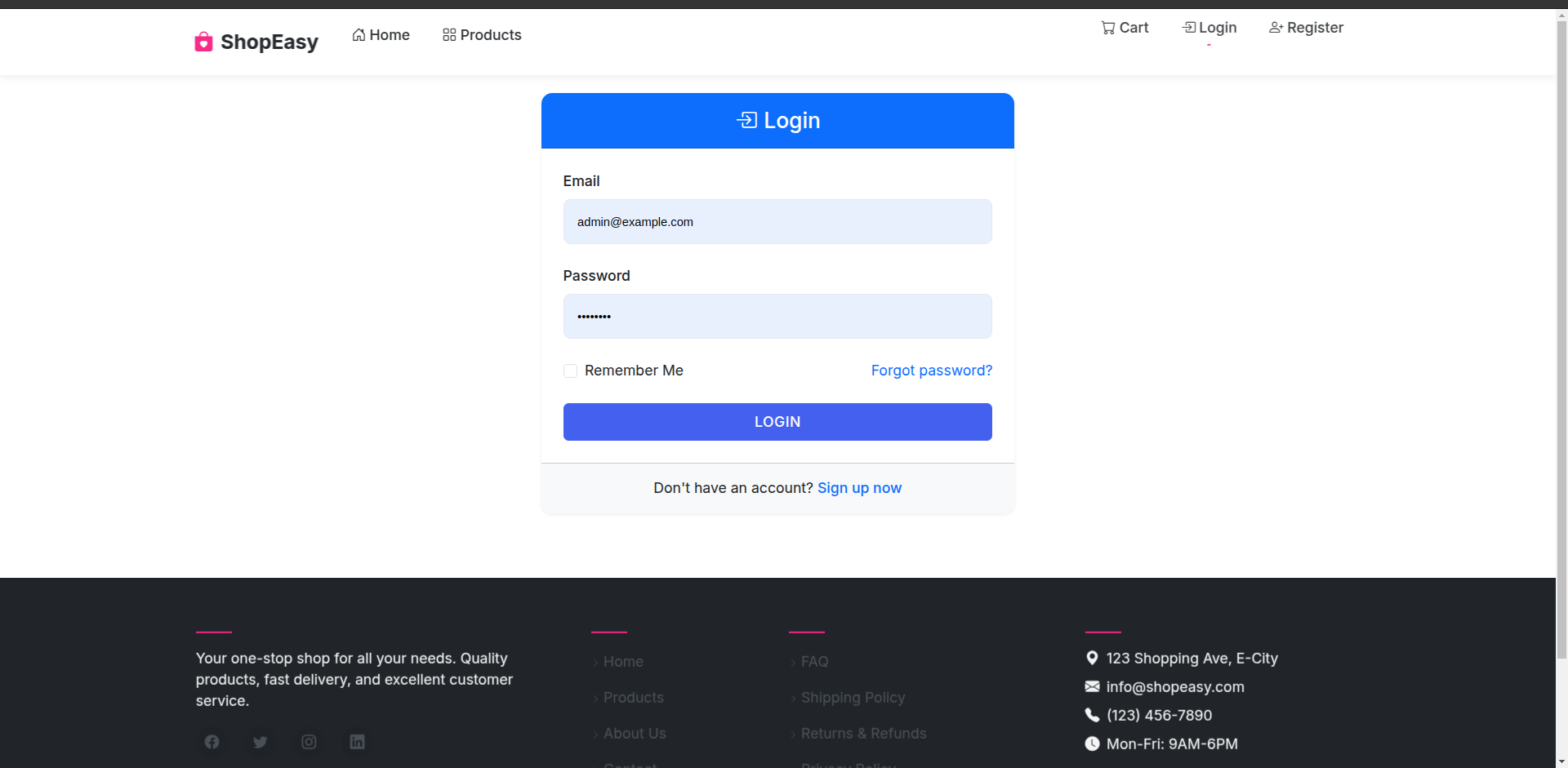
**6.5 Proposed Change-Over Techniques**  
To ensure a seamless transition to the T-ShopEasy e-commerce platform, the following change-over techniques are proposed:

* **Parallel Operation**: Initially, run the new system alongside the existing one. This allows users to become familiar with the new platform gradually while maintaining the operation of the current system. This approach helps to mitigate risks by providing a fallback option if issues arise during the transition.
* **Phased Implementation**: Roll out the new system in stages, starting with core functionalities such as product management, user accounts, and customer orders. This phased approach allows for focused testing and troubleshooting of each stage before proceeding to the next, ensuring that the system is stable and functional throughout the transition.
* **Training and Support**: Provide comprehensive training materials and support resources to users, including:
  + **User Manuals**: Detailed guides covering all aspects of the platform, from account creation to order completion.
  + **Tutorials**: Step-by-step video and written tutorials for key features, such as navigating the product catalog, adding items to the cart, and making payments.
  + **On-Site Training Sessions**: Offer live training sessions for administrators and key staff to ensure they understand how to manage the platform, handle customer queries, and troubleshoot basic issues.

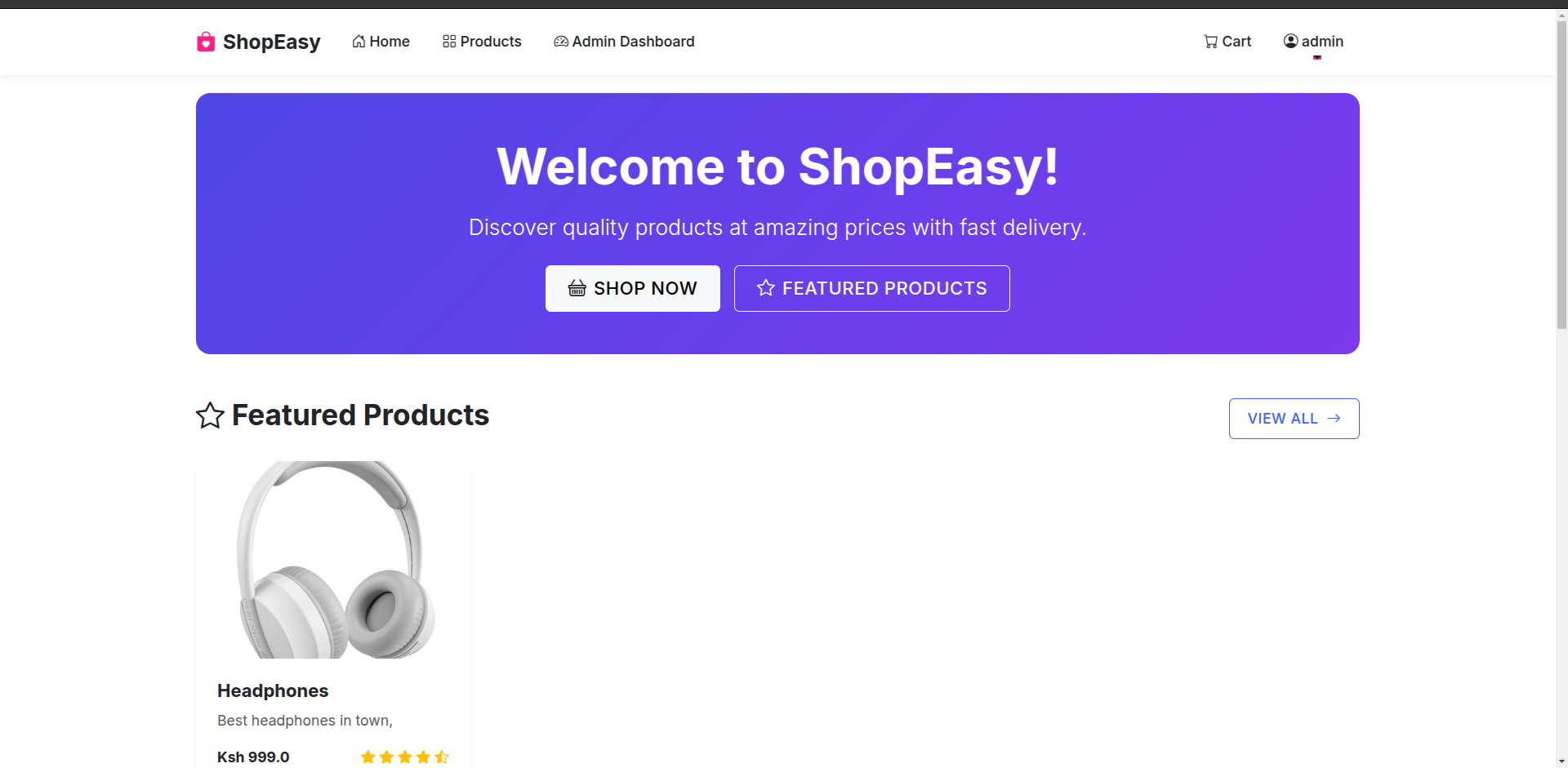
By implementing these strategies, we aim to minimize disruption during the transition while maximizing the benefits of the T-ShopEasy e-commerce platform for all stakeholders. These techniques will ensure a smooth shift to the new system, supporting both customers and internal teams effectively.

## 6.6 System screenshots

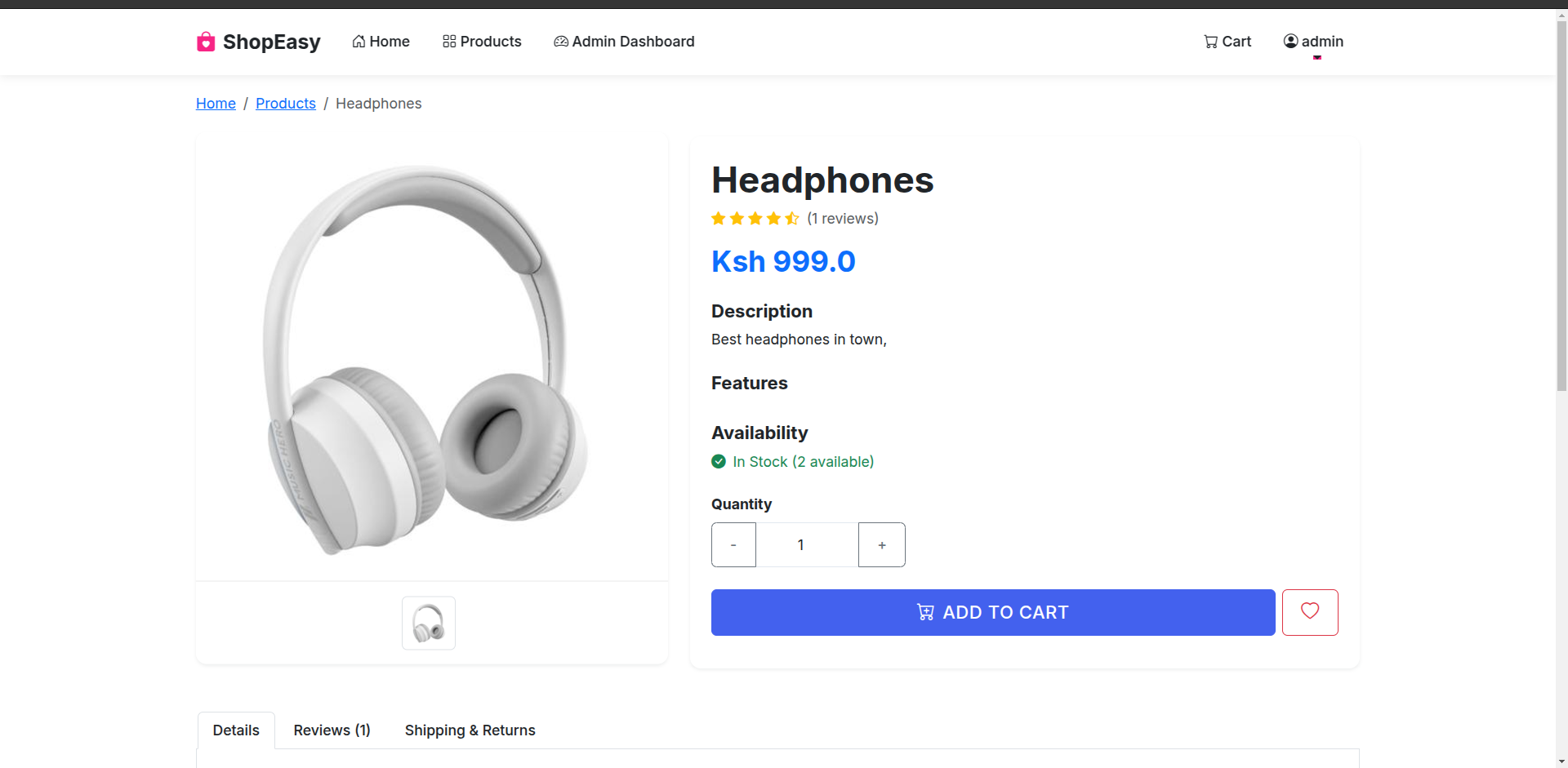
**User login**



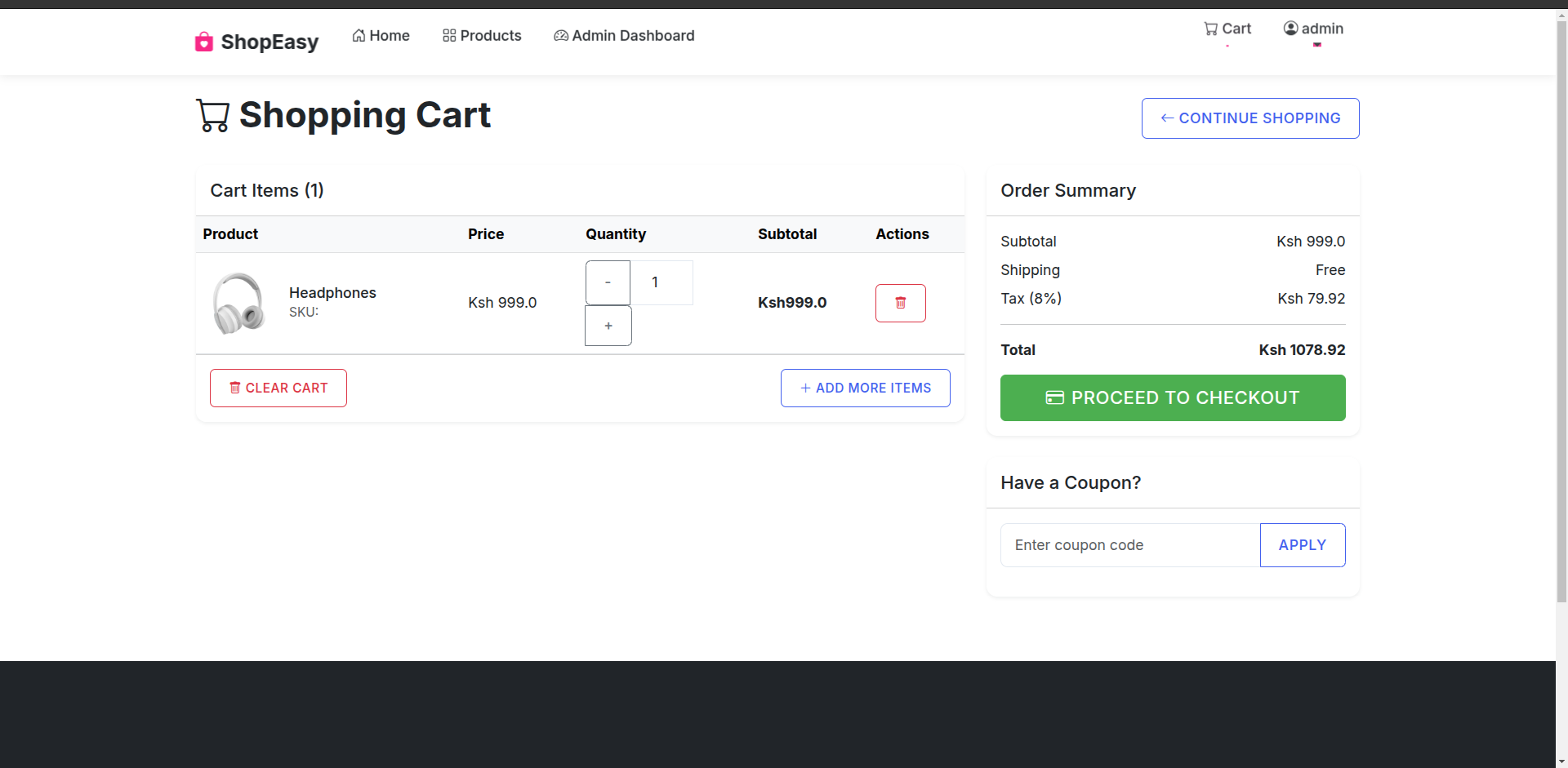
**Landing page**



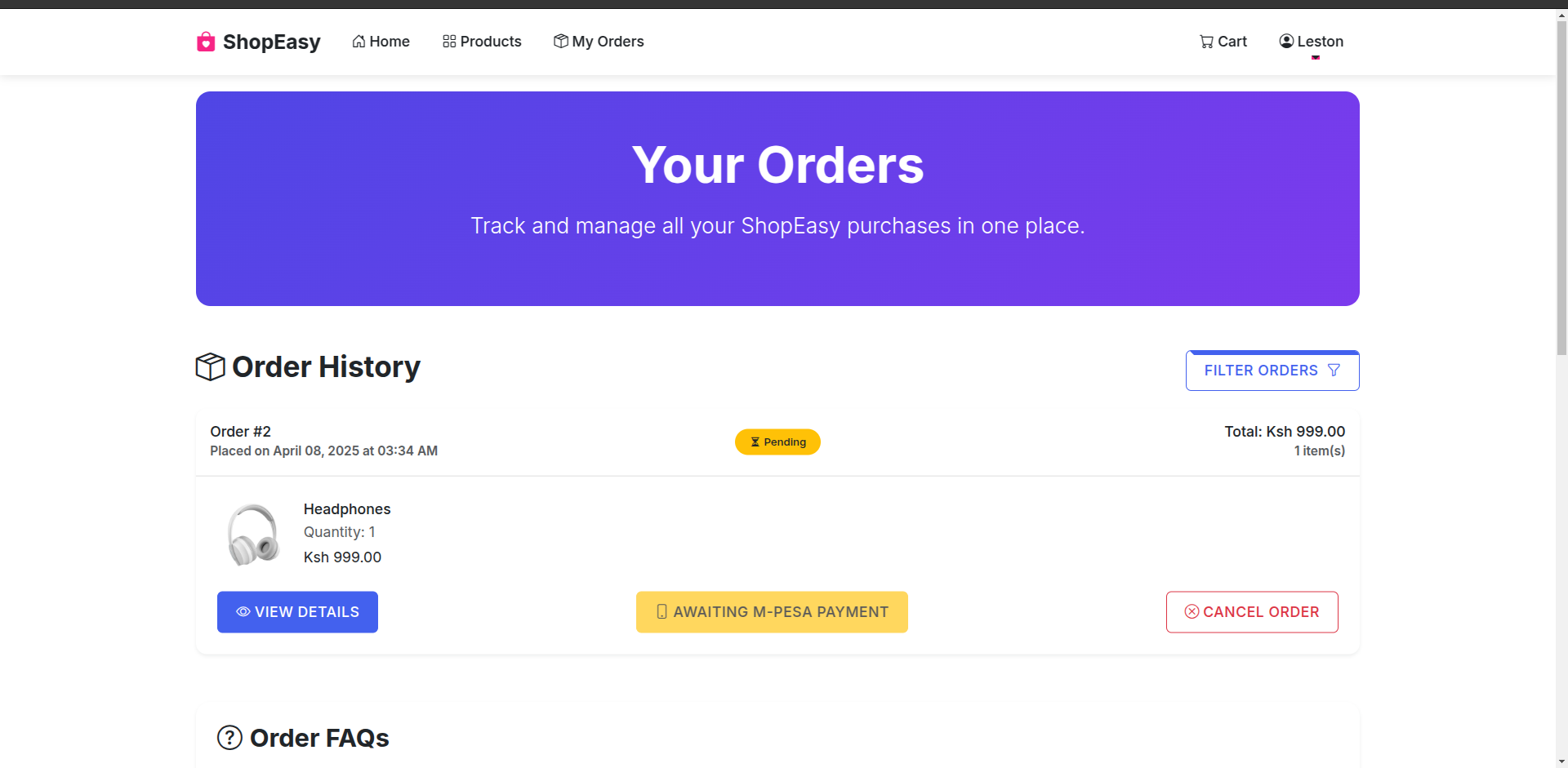
**Item details**



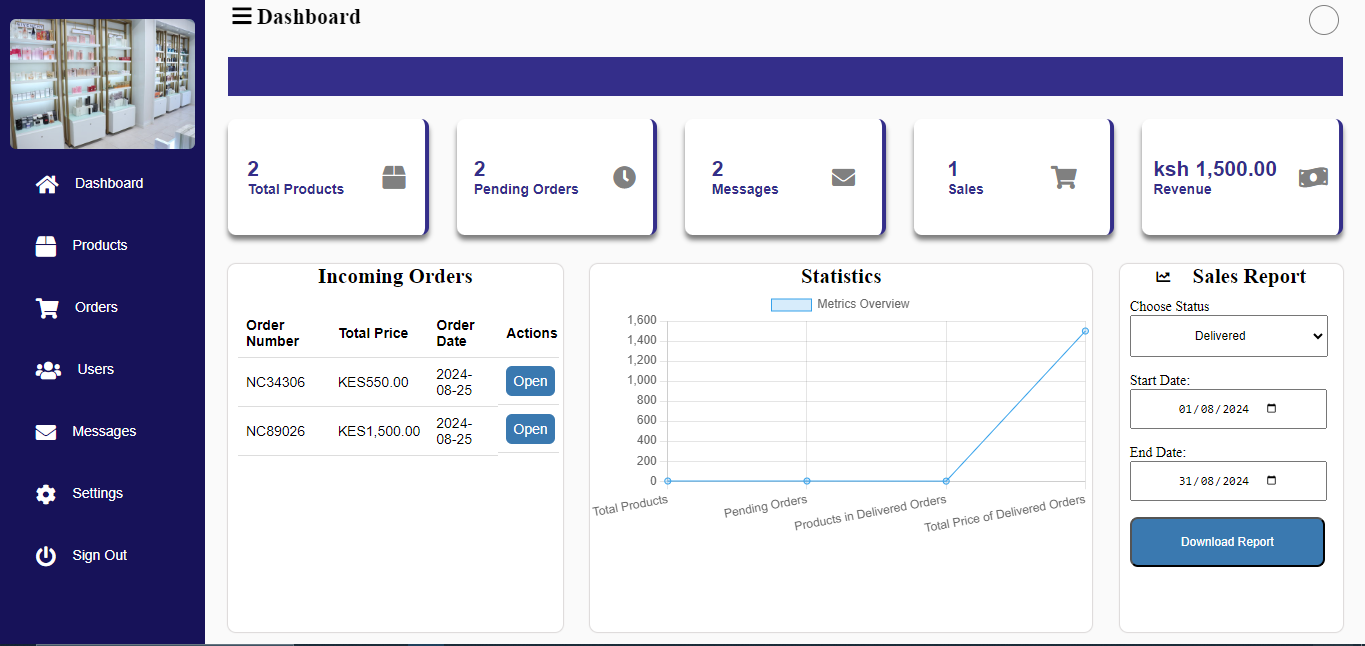
**Cart details**



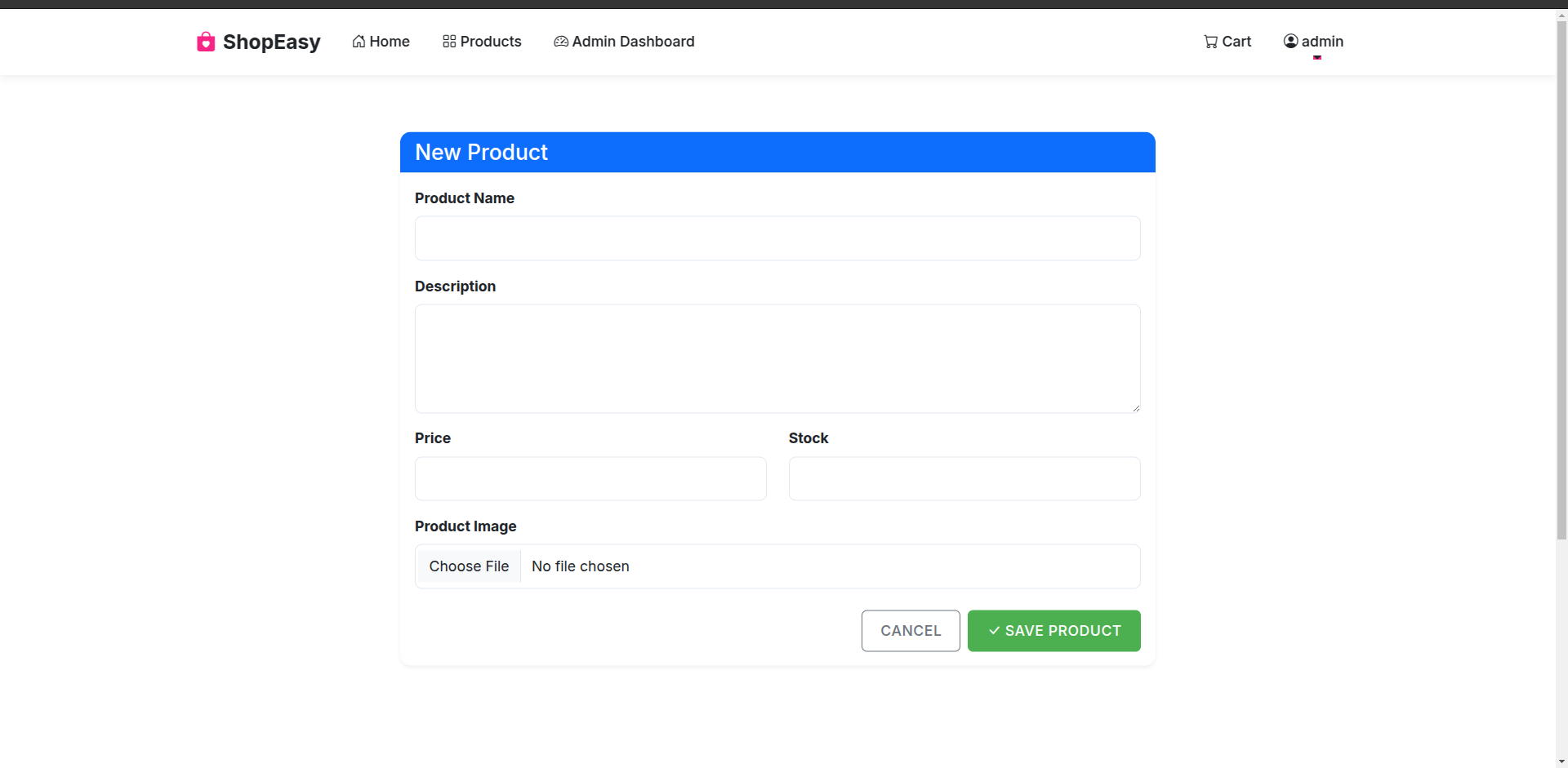
**Client order**



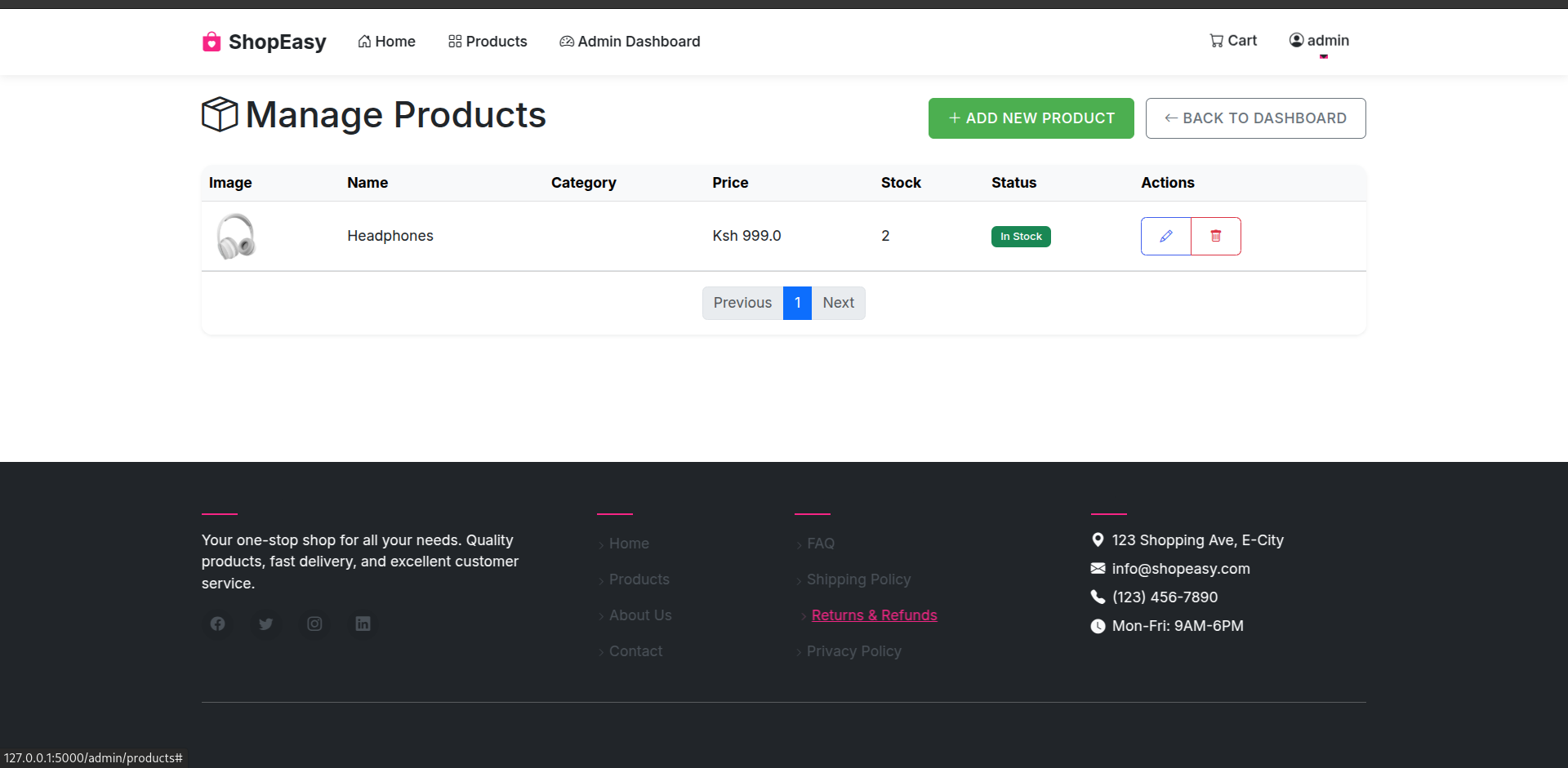
**Admin dashboard**



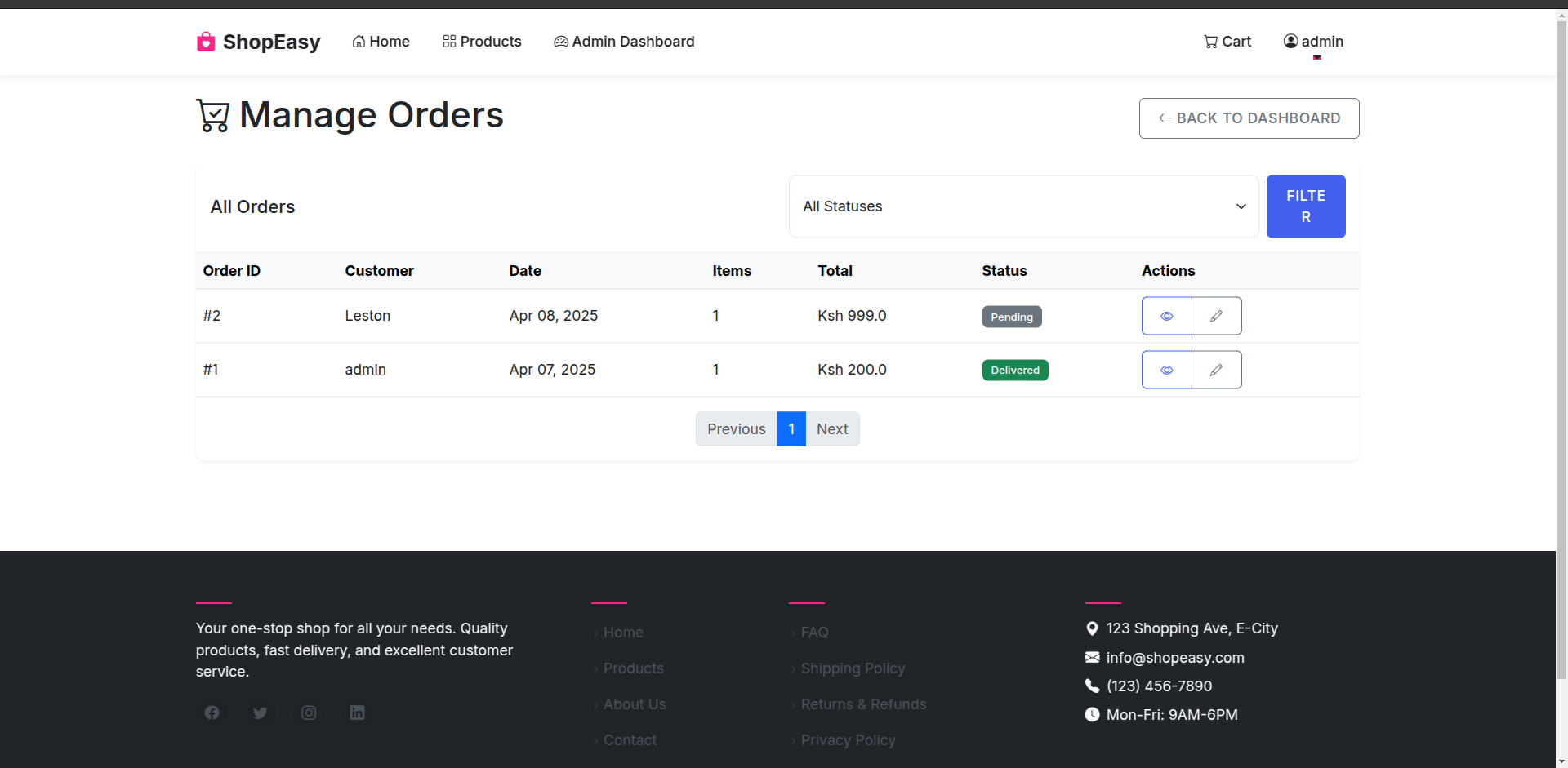
**Admin add product**



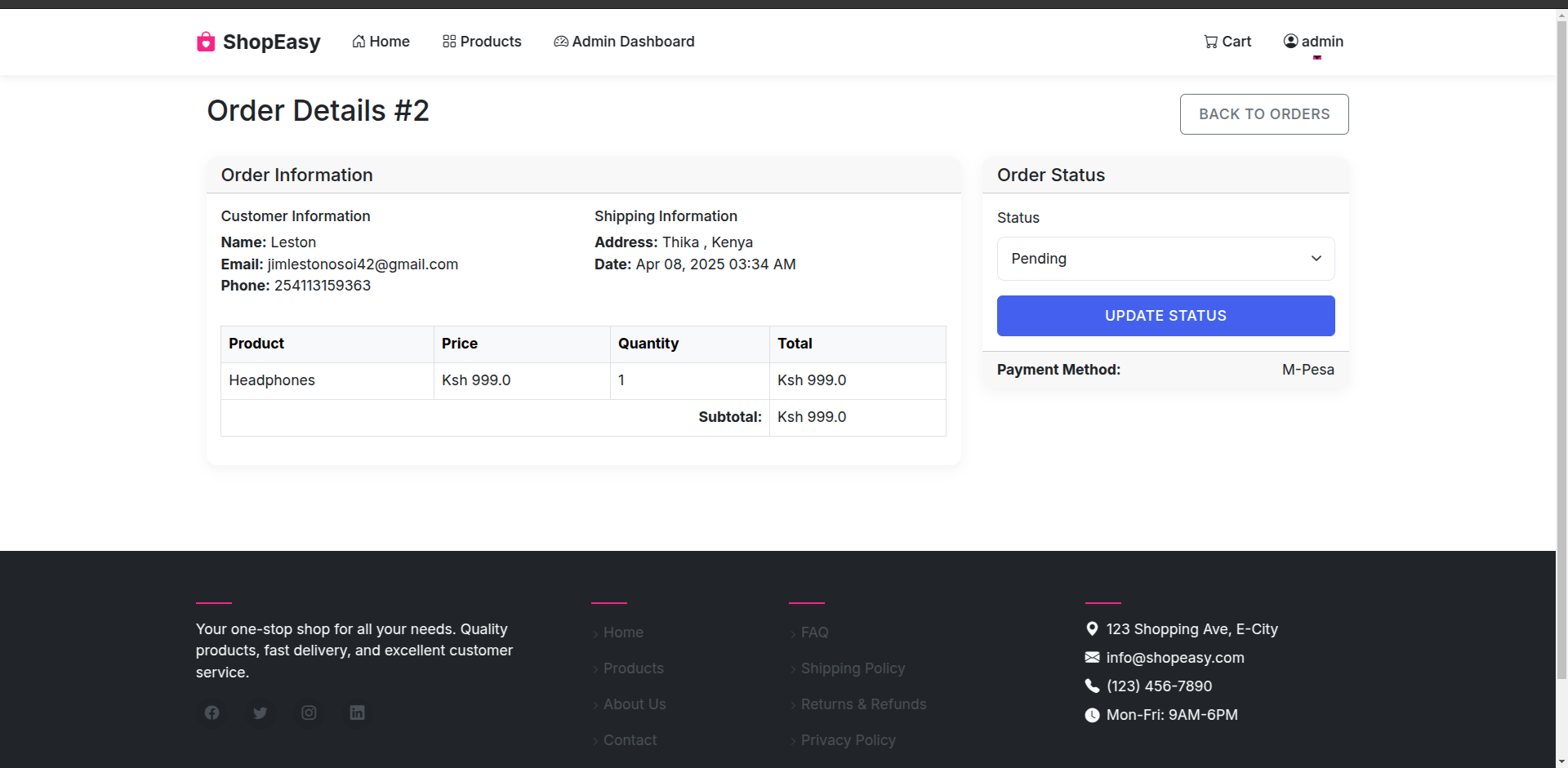
**Admin products view page**



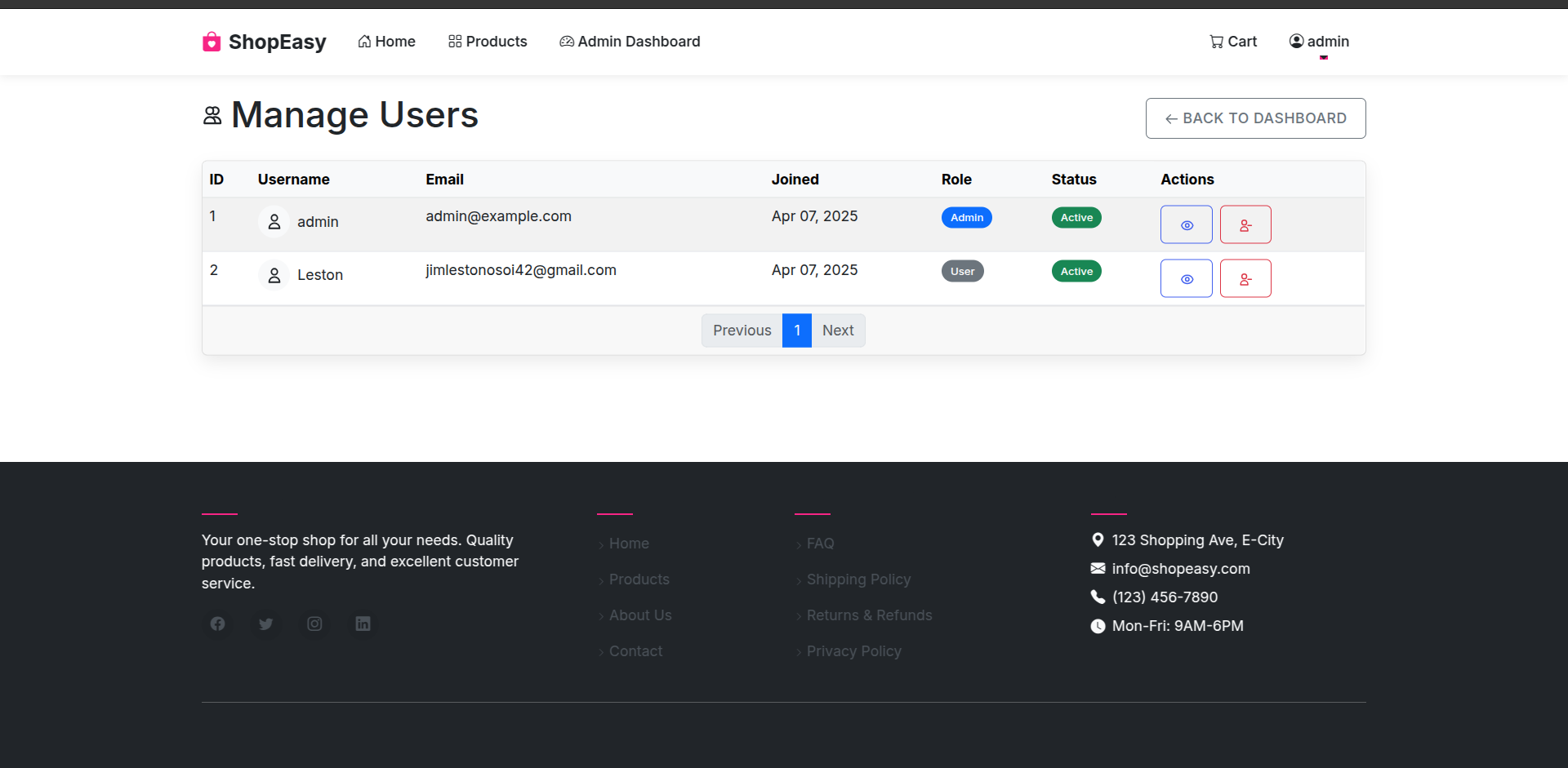
**Admin order view**

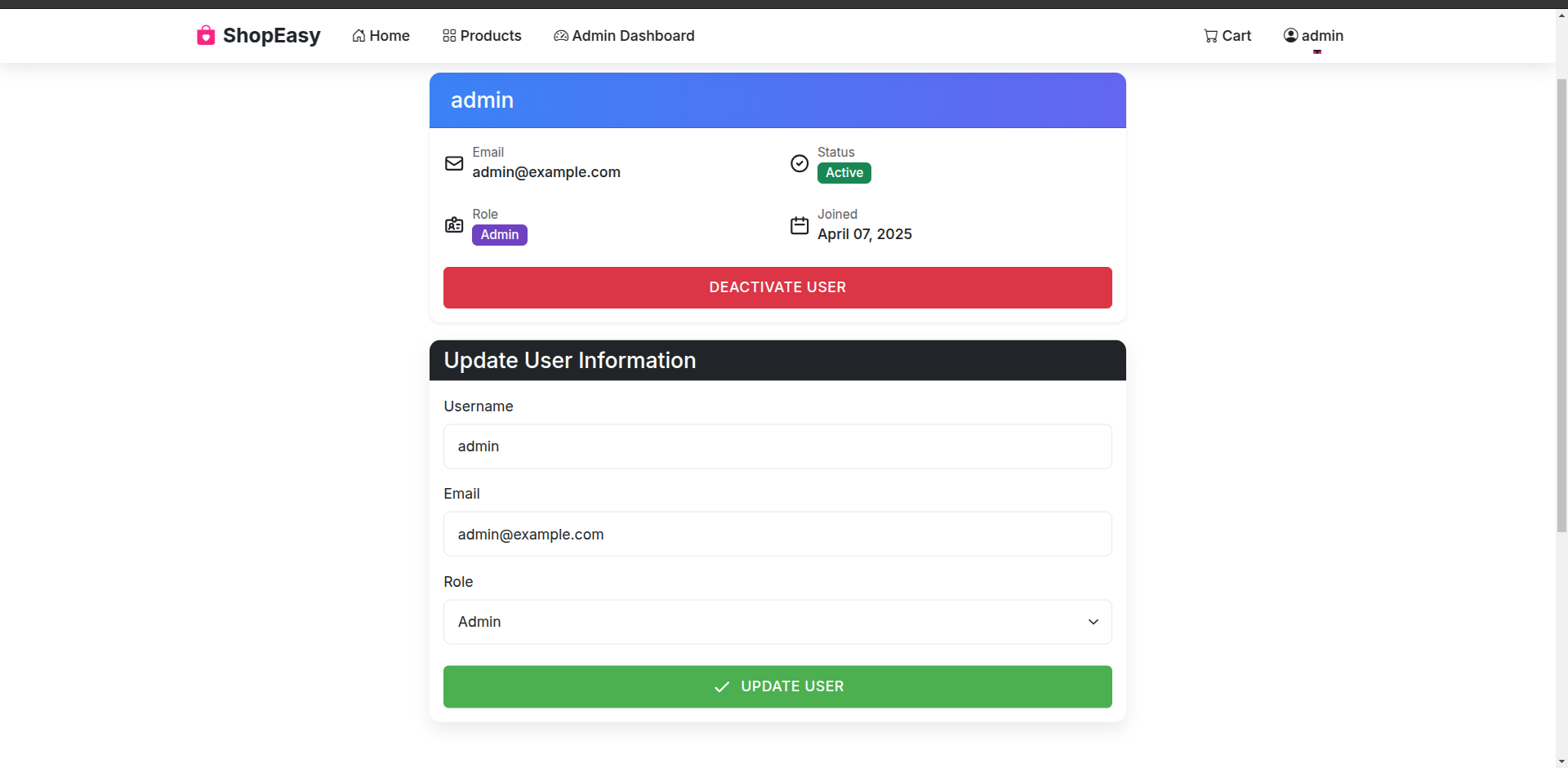


Orders view Details

****

**Manage Users**

**View Users Details**

****

# CHAPTER 7

**7.0 Limitations, Conclusions, And Recommendations**

**7.1 Limitations**  
The development of the T-ShopEasy e-commerce platform encountered several constraints that influenced different aspects of the project:

* **Time Constraints**: Developing a comprehensive e-commerce platform for a wide range of products required significant time for design, development, and testing. Despite efforts to adhere to deadlines, the complexities of integrating multiple features sometimes extended project timelines.
* **Resource Constraints**: Limited financial resources and staffing presented challenges in conducting extensive market research, implementing advanced features, and ensuring thorough testing. These constraints impacted the depth and scope of certain project elements, such as advanced customization options and real-time inventory tracking.
* **Technical Challenges**: Integrating complex functionalities like product filtering, secure payment gateways, real-time order tracking, and responsive design for various devices posed technical hurdles. Overcoming these challenges required specialized knowledge and access to advanced development tools.
* **External Factors**: External influences such as evolving e-commerce regulations, cybersecurity developments, and shifting consumer preferences required flexibility in project planning. Continuous updates were necessary to adapt to these changing external factors.

**7.2 Conclusion**  
The completion of the T-ShopEasy e-commerce platform marks the successful transformation of conceptual ideas into a fully functional solution for managing online retail across a wide range of products. By incorporating industry best practices and focusing on user-centric design principles, the system enhances operational efficiency and improves customer engagement.

Key achievements include:

* **Streamlined Customer Experience**: Simplified product discovery, secure and efficient checkout processes, and personalized product recommendations enhance the overall shopping experience, leading to higher customer satisfaction and loyalty.
* **Operational Efficiency**: Automated features like product management, order processing, and customer support help optimize backend operations, reducing manual effort and cutting operational costs.
* **Adaptation to Industry Trends**: The use of digital marketing tools, mobile-responsive design, and data-driven insights positions T-ShopEasy as a competitive player in the e-commerce market, aligning with current and future consumer demands.

The T-ShopEasy platform not only meets present market needs but also provides a scalable foundation for future growth and innovation in online retail.

**7.3 Recommendations**  
Building on the development process and the limitations encountered, the following recommendations are proposed to further enhance the T-ShopEasy platform:

* **Enhanced User Feedback Mechanism**: Integrate a comprehensive feedback system that collects user insights on their shopping experience. This could include features like post-purchase surveys, product reviews, and 24/7 customer support to address concerns quickly and gather continuous improvement ideas.
* **Continuous Iteration and Improvement**: Embrace an agile development approach to allow ongoing updates and feature enhancements based on user feedback, technological advancements, and emerging market trends. This ensures that the platform remains competitive and adaptable to evolving consumer expectations.
* **Scalability and Flexibility**: Ensure that the platform’s architecture is designed with scalability in mind, using cloud-based solutions and modular technologies. This enables the easy addition of new product categories, third-party integrations, and other features as the business grows.
* **Data-Driven Decision Making**: Implement robust analytics tools to analyze customer behavior, purchasing trends, and market data. Leveraging this data will allow for personalized marketing campaigns, predictive inventory management, and a more tailored user experience.

By adopting these recommendations, T-ShopEasy can strengthen its market position, improve customer satisfaction, and foster long-term business growth.

# **APPENDICES**

## APPENDIX A

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Document</title>

    <link rel="stylesheet" href="static/style.css">

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.4/css/all.min.css">

</head>

<body>

    <div class="main">

        <!-- top bar -->

        <?php

            include "base.php";

        ?>

        <!-- contents -->

        <div class="content">

            <!-- top section -->

            <div class="topcarousel">

                <!-- categories -->

                <div class="categories">

                    <h2 style="text-align: center;padding:10px;background-color:rgba(231, 232, 232, 0.795);">Categories</h2>

                    <?php

                    // Establish database connection

                    include "db\_connection.php";

                    // Fetch categories from the database

                    $sql = "SELECT \* FROM categories";

                    $result = $conn->query($sql);

                    if ($result->num\_rows > 0) {

                        // Output categories and subcategories

                        while($row = $result->fetch\_assoc()) {

                            echo "<div class='category'>" . $row["category\_name"] . "<button class='plus-btn'>+</button>";

                            echo "<ul class='subcategory-list'>";

                            // Fetch subcategories for the current category

                            $subcategory\_sql = "SELECT \* FROM subcategories WHERE category\_id = " . $row["category\_id"];

                            $subcategory\_result = $conn->query($subcategory\_sql);

                            if ($subcategory\_result->num\_rows > 0) {

                                // Output subcategories

                                while($subcategory\_row = $subcategory\_result->fetch\_assoc()) {

                                    echo "<li>" . $subcategory\_row["subcategory\_name"] . "</li>";

                                }

                            }

                            echo "</ul></div>";

                        }

                    } else {

                        echo "0 results";

                    }

                    // Close the database connection

                    $conn->close();

                    ?>

                </div>

                <!-- caorosel -->

                <div class="carousel">

                    <img src="images/1.png" alt="" width="100%"height="100%" style="border-radius:8px;" class="active">

                    <img src="images/2.png" alt="" width="100%"height="100%" style="border-radius:8px;">

                    <img src="images/3.png" alt="" width="100%"height="100%" style="border-radius:8px;">

                </div>

            </div>

            <p style="margin-left: 5%;padding:20px; font-size:20px;font-weight:600;">TOP</p>

            <!-- Top sales container -->

            <div class="container">

                <?php

                include "db\_connection.php";

                // Fetch products from database

                $sql = "SELECT \* FROM products where is\_best\_selling = 1" ;

                $result = $conn->query($sql);

                if ($result->num\_rows > 0) {

                    while ($row = $result->fetch\_assoc()) {

                        $detailsUrl = 'details.php?id=' . $row['product\_id'];

                ?>

                        <div class="topcards">

                            <div class="name"><?php echo $row['name']; ?></div>

                            <div class="icon" style="position: absolute; right: 3%; top: 2%; color: gray; font-size: 19px;">

                                <i class="fa fa-heart" style="color: white; font-size: 20px;"></i>

                            </div>

                            <div class="image">

                                <img src="<?php echo $row['main\_image']; ?>" alt="" style="width:100%;height:100%; border-radius:10px;">

                            </div>

                            <div class="details">

                                <div class="description"><?php echo $row['description']; ?></div>

                                <div style="display: flex; gap: 2%; color: darkgreen; font-weight: bolder; margin-top: 3px;">

                                    <p>Ksh</p><p><?php echo $row['price']; ?></p><s style="font-size: 7px; color: red;"><?php echo $row['initial\_price']; ?></s>

                                </div>

                            </div>

                            <div class="btn">

                            <div class="btns"><a href="<?php echo $detailsUrl; ?>"><i class="fa fa-eye"> View</i></a></div>

                            </div>

                        </div>

                <?php

                    }

                } else {

# APPENDIX B

## USER MANUAL

1. **Introduction**

Welcome to the ShopEasy User Manual! This guide provides everything you need to know to use our system efficiently. The ShopEasy Online Shop System is designed to streamline the online shopping experience, enhance product management, and facilitate seamless interactions between customers, administrators, and support staff. This manual will help you navigate the system effectively and make the most of its features to meet your e-commerce needs.

1. **System Access**

Accessing the system is simple! Open your web browser and enter the URL: http://localhost:5000/eccommerce

* + **Login**: Enter your email and password in the designated fields and click "Login."
  + **Register**: If you don't have an account, click on "Register" to create a new account.

1. **User Roles and Permissions**

In the ShopEasy Online Shop System, users have different roles and permissions based on their responsibilities:

* + **Administrators**: Have full access to system features, can manage products, orders, and users.
  + **Customers**: Can browse products, place orders, and manage their personal information.
  + **Support Staff**: Can assist customers with inquiries and manage customer support tickets.

1. **Dashboard**

The Dashboard provides a centralized hub for accessing key information and features of the system at a glance.

* + **Widgets**: Display important statistics such as total sales, new customers, and pending orders.
  + **Notifications**: Show alerts for pending tasks and updates.
  + **Shortcuts**: Provide quick access to commonly used features like adding new products and viewing order details.

1. **Product Management**

Managing products is straightforward! Navigate to the "Products" section:

* + **Add New Product**: Click on "Add New Product," enter the product details (name, category, price, description, and images), and click "Save" to add it to the system.
  + **Edit or Delete Product**: Select an existing product to edit its details or delete it from the system as needed.

1. **Customer Management**

Keeping customer records up to date is essential. In the "Customers" section:

* + **Edit Customer Information**: Select a customer to update their details.
  + **Delete Customer**: Remove customers from the system if necessary.

1. **Search Functionality**

Finding specific products or orders is easy with the search functionality:

* + **Search by Criteria**: Use filters to narrow down search results by product category, or customer name.
  + **Advanced Search**: Find products or orders that meet specific criteria quickly and efficiently.

1. **Help and Support**

Need assistance? Our support team is here to help:

**Contact**: Reach us via phone, email, or helpdesk for prompt support.

# REFERENCES

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