

# **Home Designer**

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**Faculty of Computing Riphaah International University,  
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**Riphah International University, Islamabad**

Date: [date of final presentation]

# Final Approval

This is to certify that we have read the report submitted by **Malik Muhammad Farhad Ashraf (12354)**, **Usama Hussain (24878)**, for the partial fulfillment of the requirements for the degree of the Bachelors of Science in Software Engineering (BSSE). It is our judgment that this report is of sufficient standard to warrant its acceptance by Riphah International University, Islamabad for the degree of Bachelors of Science in Software Engineering (BSSE).

## Committee:

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**Mr. Shahzad Ahmed Khan**  
(Supervisor)

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(Head of Department/chairman)

## **Declaration**

We hereby declare that this document “**Home Designer**” neither as a whole nor as a part has been copied out from any source. It is further declared that we have done this project with the accompanied report entirely on the basis of our personal efforts, under the proficient guidance of our teachers especially our supervisor **Mr. Shahzad Ahmed Khan**. If any part of the system is proved to be copied out from any source or found to be reproduction of any project from anywhere else, we shall stand by the consequences.

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## **Dedication**

"We offer this project in honor of Allah, our supreme creator, our steadfast foundation, the wellspring of our inspiration, sagacity, erudition, and insight. His unwavering support sustained us throughout this endeavor. Moreover, we dedicate our efforts to our relatives, companions, and mentors. The unparalleled motivation from our families and exceptional backing from educators were pivotal to the triumph of this project. Additionally, we dedicate this work to our mentor, **Mr. Shahzad Ahmed Khan**, and the academic staff."

## **Acknowledgement**

First of all, we are obliged to Allah Almighty the Merciful, the Beneficent and the source of all Knowledge, for granting us the courage and knowledge to complete this Project. We are grateful to our supervisor **Mr. Shahzad Ahmed Khan** for his enthusiasm, patience, insightful feedback, beneficial records, realistic recommendation, and unceasing ideas that continually helped us quite in our project. Without his guide and steering, this undertaking might no longer have been viable. Also, a special way to the rest of the faculty members for their unconditional guide.

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# **Abstract**

Interior designing is all about creating and shaping the experience of interior spaces. This involves arranging furniture, choosing color schemes, setting up lighting, and selecting materials to create an appealing atmosphere within a room or building.

However, traditional interior designing can be challenging. It often involves mockups, using material samples, and referring to design booklets. These methods can make it tough to visualize the final design clearly and accessibly.

## Contents

Introduction .....	10
1.1 Opportunity & Stakeholders: .....	11
1.1.1 Stakeholders: .....	11
1.2 Solution Overview: .....	12
1.2.1 Project Scope.....	13
1.3 Report Outline .....	15
1.3.1 Chapter 1 .....	15
1.3.2 Chapter 2 .....	15
1.3.3 Chapter 3 .....	15
1.3.4 Chapter 4 .....	15
1.3.5 Chapter 5 .....	15
Chapter 2: Literature/Market Survey .....	16
2.1 Introduction .....	17
2.1.1 Client Profile .....	17
2.1.2 Problem Details .....	17
2.1.3 Understanding the User Environment .....	17
2.1.4 Usability of the system .....	17
2.1.5 Analyst's Input on the Client's Problem .....	18
2.1.6 Assessing the solution .....	18
2.1.7 Assessing the Opportunity .....	18
2.1.8 Assessing Reliability, Support & Performance Needs .....	18
2.1.9 Legal Limitations .....	18
2.1.10 Wrap-up.....	18
2.2 Brainstorming.....	19
2.3 Existing Systems .....	19
2.4 Summary .....	20
Chapter 3: Requirement Analysis .....	21
3.1 Introduction .....	22
3.2 Problem Scenarios.....	22
3.3 Functional Requirements: .....	24
3.4 Non-Functional Requirements .....	30
3.5 Summary: .....	31



Chapter 4: .....	33
System Design.....	33
4.1 Introduction .....	33
4.2 Architectural Design .....	33
4.3 Detailed design.....	34
4.3.1: Use case for Admin:.....	34
4.3.2: Use Case for Admin and Customer.....	35
4.3.3: Use Case for Vendor .....	36
4.3.4: Use Case for Designer.....	37
4.3.5 Use Case Fully Dressed Format .....	38
4.3.6 Activity Diagrams .....	50
4.3.7 Component Diagram .....	54
4.3.8 Data Base Design .....	54
4.3.9 Summary .....	54
Chapter 5: .....	55
Implementation .....	55
Chapter 5: .....	56
Implementation .....	56
5.1 Endeavour .....	56
5.1.1 Team.....	56
5.1.2 Work Breakdown Structure.....	56
5.2 Flow Control/Pseudo codes.....	59
5.3 Components, Libraries, Web Services and stubs .....	59
5.4 IDE, Tools and Technologies.....	59
5.5 Best Practices / Coding Standards.....	59
5.5.1 Software Engineering Practices .....	59
5.5.2 Development Practices & Standards .....	59
5.6 Deployment Environment .....	59
5.7 SQA activities: Defect Detection .....	59
5.7.1 Test Case Design (White box) .....	59
5.8 Summary .....	59

## Chapter 1: **Introduction**

## **Chapter 1:**

### **Introduction**

Interior designing is all about creating and shaping the experience of interior spaces. This involves arranging furniture, choosing color schemes, setting up lighting, and selecting materials to create an appealing atmosphere within a room or building.

However, traditional interior designing can be challenging. It often involves mockups, using material samples, and referring to design booklets. These methods can make it tough to visualize the final design clearly and accessibly.

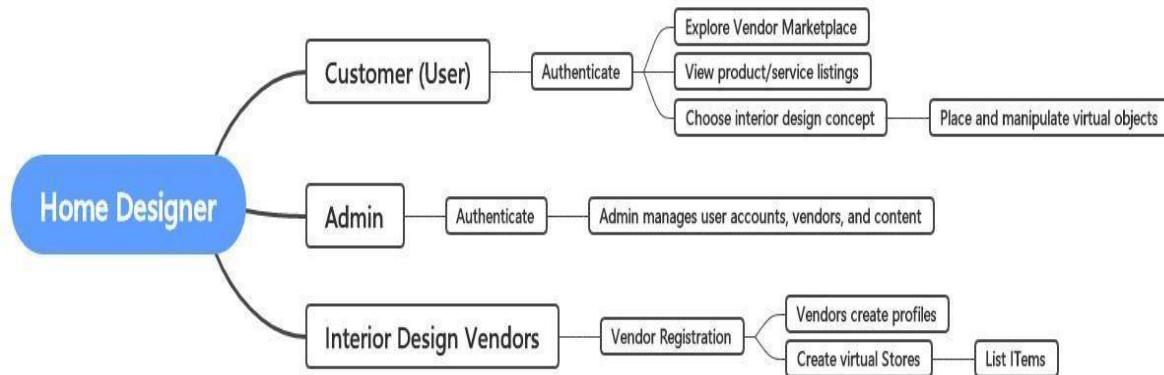
#### **1.1 Opportunity & Stakeholders:**

- The process of selecting materials and color schemes that align with the customer's environment can be time-consuming.
- Producing visual representations of designs demands expensive hardware and software.
- Customers have to take time out of their busy schedules to visit design firms and see the designs in person.
- In case of mismatch, redesigning the entire visual concept from scratch may be necessary.
- Decision-making regarding product selection can be a complex process and time consuming.
- Some firms offer products on a trial basis, which may not be suitable for all customers.
- Local vendor posts their designs and products to online social media platforms and don't have any market place to connect online customers
- Also designers and organizations don't have market place for product listing besides have to visit in person to get visuals.

##### **1.1.1 Stakeholders:**

- Customer (User)
- Admin Local Vendors
- Designer

## 1.2 Solution Overview: Interior Design Marketplace and Visualization Platform.



- **Online Marketplace:**

**For Local Vendors:** Create a marketplace where local vendors can list their products, including furniture, materials, and decor items. This platform allows them to showcase their offerings and connect with a broader customer base.

**For Customers:** Offer a wide range of products for customers to browse, compare, and purchase. Implement filters for preferences like style, color, price range, etc.

- **Design Visualization Tools:**

**Virtual Room Design:** Provide tools for customers to virtually design their spaces. They can upload photos or floor plans of their rooms and experiment with different products, colors, and layouts to visualize the final look.

**Material & Color Selection:** Offer a library showcasing various materials and color schemes. Customers and designers can mix and match these virtually to see how they blend in a space.

- **Collaborative Features:**

**Designer Collaboration:** Allow customers to connect with designers virtually, share ideas, and receive expert advice. Designers can create and modify designs in real-time based on customer preferences.

**Feedback Loops:** Enable easy communication between customers and vendors.

Customers can leave reviews, ask questions, and get prompt responses.

- **Mobile Application & AR Integration:**

Create a mobile app for on-the-go access, enabling users to visualize products and designs in their space using augmented reality (AR) technology.

- **Simplified Decision-Making:**

Offer comprehensive product information, reviews, and even allow customers to order samples to see how they fit within their space before making a purchase.

Implement a feature for mood boards or collections, where users can curate and save their preferred products and designs for future reference.

- **Admin Panel & Support:**

Admin Dashboard for vendors and designers to manage listings, orders, and customer queries.

Customer support to assist with design-related queries and technical issues.

- **Security & Trust:**

Implement secure payment gateways and ensure data protection to foster trust among users. Verify vendors for quality and reliability to maintain the marketplace's reputation. By integrating an online marketplace with powerful visualization tools and collaboration features, this solution aims to streamline the interior design process, making it more accessible, efficient, and enjoyable for all stakeholders involved.

### **1.2.1 Project Scope**

Develop a mobile application (Android) that integrates augmented reality (AR) technology to allow users to visualize interior design items(virtual) in real-time. To Empower the local vendors, create a web-based marketplace platform that connects local interior design vendors with potential customers.

#### **1.2.1.1 MODULES**

- **User Authentication and Management**

- Allow users to create accounts and profiles.
- Implement authentication and authorization mechanisms.
- Manage user roles (e.g., customers, vendors, administrators)

- **Augmented Reality Interior Design Module**

- AR based mobile application for visualizing interior design concepts.
- 3D models of furniture, decor, and paint colors.
- Real-time placement and manipulation of virtual objects.
- Scene saving and retrieval for later editing.
- Sharing and collaboration features

- **Vendor Marketplace Module:**

- Vendor registration and profile creation.
- Product and service listings with descriptions and prices.
- Vendor reviews and ratings.

- **Product Selection Module:**

- Adding selected items to a shopping cart.
- Enable users to select a specific product of interest from the catalog.
- Allow users to view the selected product within their physical space through their device's camera.

- **Payment and Transactions Module:**

- Secure payment processing for purchases.
- Handling transactions between users and vendors.
- Order history and transaction records.

- **Notifications Module:**

- Email notifications for account-related actions and updates.
- Messaging system for user-vendor communication

- **Admin Panel:**

- Backend admin panel for managing user accounts, vendors, and content moderation.

- **location Integration:**

- Implement geolocation services to determine the Vendor's store location

### **1.3 Report Outline**

This report covers the detail of all aspects of the system, for understanding and clarity. This report has been divided into seven chapters.

#### **1.3.1 Chapter 1**

This chapter introduces our system by the needs and technical issues addressed by the system. Goals, objectives, and methodologies used for the development of the proposed solution.

#### **1.3.2 Chapter 2**

This chapter focuses on the current situation of the market, and how the system is unique and useful for the users.

#### **1.3.3 Chapter 3**

This chapter is all about need analysis as it examines the real requirements and problem scenarios addressed by the developed system. It also identifies the real user of the system and those affected by the system.

#### **1.3.4 Chapter 4**

This chapter provides all the information related to design factor of the developed system by describing the system architecture design consideration and different diagrams that model the working behavior of the system.

#### **1.3.5 Chapter 5**

This chapter provides information about the environment in which the developed system was used and evaluated for the performance, usability, and other related consideration.

## **Chapter 2:**

# **Literature/Market Survey**



## **Chapter: 2**

### **Literature/Market Survey**

#### **2.1 Introduction**

In this chapter, we are discussing the literature/market survey of our project “Home Designer”.

For our project, we've got used interviewing method to acquire the functional requirements of the project. Further, we've created a table in which we've got as compared the features of the similar current systems of our project.

##### **2.1.1 Client Profile**

- Name of Organization: Home Designer
- Industry: Interior Design
- What are the key responsibilities of your organization?
- What services do you provide?
- For whom are these services?
- How is the success of your services measured?
- Which problems interfere with your success?

##### **2.1.2 Problem Details**

- Why does this problem exist?
- How is the problem currently being solved, if solved?
- How would you like to get the problem solved?

##### **2.1.3 Understanding the User Environment**

- Who are the users of this AR project?
- What are their geographical locations?
- Do they have any previous experience with a similar AR project?
- Do you plan to expand the system to more platforms in the future?

##### **2.1.4 Usability of the system**

- Are any other systems that are to be integrated with this system?
- How usable should be the website for AR base?
- Do you expect the training, to get the users familiar with the system?

### **2.1.5 Analyst's Input on the Client's Problem**

- What causes the problem that you currently face?
- How is the problem currently being solved?
- What would you like the solution of the problem to be?
- How would you rank each problem when compared with others?

### **2.1.6 Assessing the solution**

What if you could

- Have a mobile application for the AR base platform?
- Have cloud data storage for everything on the AR project?
- How would you rank the importance of these?

### **2.1.7 Assessing the Opportunity**

- Who is this project's targeted user?
- How many users will use it?
- On what basis would you find the solution successful?

### **2.1.8 Assessing Reliability, Support & Performance Needs**

- How reliable do you expect the system to be?
- What are your expectations for performance of the system?
- Will you support the system or someone else? if so, who?
- Do you have special needs for support?
- What are the security requirements?
- Is there any special licensing that is needed for this type of system?
- What kind of maintenance, if any, do you want for the system?

### **2.1.9 Legal Limitations**

- Are there any legal and regulatory limitations or standards that we must observe when building the system?

### **2.1.10 Wrap-up**

- Are there any further details that you might want to add that this questionnaire did not cover?
- How would you like to be contacted for any further follow-ups and requirements?

## 2.2 Brainstorming

## 2.3 Existing Systems

**Existing System/ Description of the Current Situation:**

**Comparison Matrix of Existing Systems:**

Features	Ikea Place	Houzz	Augment	Home Styler	AR viewer	Dulux Paints	homify	Magic plan	HomeBy Me	Decor Matter
Furniture / Product Catalog:	✓	✓	✓	×	×	✓	×	×	×	✓
Authentication	×	✓	✓	×	×	×	✓	✓	×	✓
Customization and Personalization:	✓	✓	✓	✓	×	✓	✓	✓	✓	✓
Use of 3D Models	✓	✓	✓	✓	✓	×	✓	×	✓	✓
Offline Functionality	×	✓	✓	×	×	×	×	✓	×	×
Vendor Integration:	✓	✓	×	×	×	✓	×	×	×	✓
Guidance/UserManual	✓	×	✓	×	×	✓	×	✓	×	×
E-commerce Availability	✓	✓	✓	×	×	✓	×	×	×	✓
History of Designs	✓	×	✓	×	×	×	✓	×	×	×
User Feedback and Complaints	✓	✓	✓	×	×	×	✓	✓	✓	✓

**Description:** Comparison of the features of the mentioned interior design systems:

1. **Furniture/Product Catalog:** All systems offer a furniture and product catalog, allowing users to explore various design options.
2. **Authentication:** Houzz, Augment, and DecorMatter provide user authentication, enhancing security and personalization.
3. **Customization and Personalization:** All systems except AR Viewer and Homify allow users to customize and personalize their design choices.
4. **Use of 3D Models:** Most systems utilize 3D models to enhance the visualization of interior designs.
5. **Offline Functionality:** Houzz, Augment, and HomeByMe offer offline functionality, ensuring users can work on their designs even without an internet connection.

6. **E-Commerce Integration:** Ike a Place, Dulux Paints, and HomeByMe integrate with vendors, streamlining the purchasing process.
7. **User Feedback and Complaints:** Ike a Place, Houzz, and DecorMatter offer user feedback and complaints features, promoting user engagement and feedback collection. These features vary across the systems, catering to different user preferences and needs in the field of interior design.

## 2.4 Summary

Chapter 2 of the "Home Designer" project report delves into an extensive literature and market survey, employing methods such as interviews and comparative analysis of similar systems to gather essential project requirements. The chapter covers a diverse range of areas, starting with the client profile of Home Designer within the non-fungible tokens industry, outlining their responsibilities, services, success metrics, and hindrances. It delves into the detailed problems faced, user environment analysis, usability aspects, analyst input on client issues, potential solutions assessment, opportunity evaluation, reliability and performance needs, legal limitations, and a concluding section for additional inputs and contact preferences. The chapter also includes a comparison matrix of existing interior design systems, highlighting core features such as furniture catalogs, authentication, customization, 3D modeling, offline capabilities, e-commerce integration, and user feedback mechanisms, aiming to capture a comprehensive understanding of user requirements and existing market dynamics for the project's development.

## **Chapter 3:**

# **Requirement Analysis**

## **Chapter 3:**

### **Requirement Analysis**

#### **3.1 Introduction**

In this chapter, we will discuss the Functional & Non-Functional requirements of our project “Home Designer”. Prior to that, we will discuss all the problem statements we have found while doing research on the project idea. These functional requirements are gathered from the client using several techniques like interviewing and brainstorming. The Non-Functional requirements are gathered by observing the functional requirements.

#### **3.2 Problem Scenarios**

##### **The Problem of Time-Consumption in Interior Design:**

Elements	Description
The problem	Traditional interior design methods demand a significant amount of time for tasks such as furniture and color scheme selection, as well as physical visits to design firms. These time-consuming processes can lead to project delays and inconvenience for both customers and designers.
Affects	Customers, Designers.
The Result of which	The result is prolonged project timelines, potential missed opportunities, and increased customer frustration.
Benefits of	Addressing this Time-related problem would make interior design services time and cost-effective and accessible, benefiting both customers and professionals.

### **The High Costs of Interior Design Visualization:**

Elements	Description
The problem	Producing visual representations of interior designs demands expensive hardware and software, which can significantly increase project costs. This cost burden can be a limitation for both customers and interior design professionals.
Affects	Customers, Designers.
The Result of which	The result is increased project expenses, which may be passed on to customers, making interior design services less affordable.
Benefits of	Addressing this problem would Accelerate the Visualization process, reduce costs, and enhance customer satisfaction by aligning designs with their vision more effectively.

### **The Complexity of Decision-Making in Interior Design:**

Elements	Description
The problem	Decision-making in interior design, including material and product selection, can be a complex and time-consuming process. Customers often struggle to make informed choices due to limited visualization options and a lack of trial opportunities.
Affects	Customer.
The Result of which	The result is a less streamlined interior design process, potential mismatches, and customer frustration.
Benefits of	Addressing this issue would simplify the decision-making process, improve customer satisfaction, and reduce project timelines through informed choices and trial options.

### **Lack of Visibility for local Vendors:**

Elements	Description
The problem	Local interior design vendors often lack a dedicated online marketplace to showcase their products and connect with potential customers. This lack of visibility restricts their reach and opportunities for growth.
Affects	Vendors.
The Result of which	The result is missed opportunities for vendors to expand their businesses and for customers to access a variety of design products.
Benefits of	Addressing this vendors-related problem would create a platform for vendors to reach a potential customer base and provide customers with more product options, ultimately benefiting both parties involved in interior design projects.

### **3.3 Functional Requirements:**

- **Customer**

FR1: User can login in the system with valid credential and User can also signup in the system.

FR2: User can reset the password by using valid email and User can have option for two step verification for enhanced security.

FR3: User can have secure login functionality with password protection and the registration process should include password creation and validation.

FR4: Users should be able to update and manage their profile information and Profile changes should reflect across the platform.

FR5: User can select products using search bar and an intuitive search bar for users to find products easily.

FR6: User can add or select multiple products to cart and Users can also add, remove, and



adjust quantities of items in the shopping cart.

FR7: Filters and sorting options for refining search results.

FR8: Clear and detailed product pages displaying images, descriptions, pricing and information on product availability and shipping details.

FR9: Real-time updates of the total cost in the shopping cart.

FR10: Streamlined and user-friendly checkout process with multiple steps and secure payment gateway integration with various payment options.

FR11: Users receive immediate confirmation of their order and email confirmation with order details sent to the user.

FR12: Users can track the status and location of their orders and Real-time updates on shipping and delivery.

FR13: Access to a comprehensive history of past orders and Users can reorder from them order history.

FR14: Users can create and manage wish lists or favorite lists and Option to share wish lists with others.

FR15: Users receive notifications about discounts, promotions and application of discount codes during checkout.

FR16: Users can leave reviews and ratings for products and reviews are visible on product pages.

FR17: Access to a comprehensive help center or FAQ section and search functionality within the help center.

FR18: Easy access to customer support through chat, email, or phone and ticketing

system for issue resolution.

FR19: Responsive for cross the devices.

FR20: Option to share purchases or wish lists on social media and social media login options for easier registration.

FR21: Multi-language support for a diverse user base and Option for users to choose them preferred language.

FR22: Tips and guides on using various features and guidance lessons for people who are new to a system.

FR23: Real-time inventory tracking to prevent overselling and notifications for users when a product is low in stock.

FR24: Users can save and manage multiple shipping addresses and select able addresses during the checkout process.

FR25: Option for users to subscribe to newsletters or promotional emails and easy option for unsubscribing the new letter.

FR26: Users can compare multiple products side by side and Highlighting of key features for easy comparison.

FR27: Feature for users to virtually try on products and Augmented reality 3d viewing on browser options.

FR28: Users can communicate with sellers or other users within the app and moderation to prevent misuse.

FR29: In-app communication with clients and share design concepts and gather feedback.

FR30: Users can set up alerts for out-of-stock products and notifications when the desired product is back in stock.

FR31: Users can rate their satisfaction with customer support interactions and Feedback loop for continuous improvement.

FR32: Users can customize certain products and real-time previews and pricing adjustments.

FR33: Interactive tutorials or guides for using complex products and accessible directly from the product pages.

FR34: Users can attach AR images or videos to their product reviews and enhanced visualization for potential buyers.

- **Vendor**

FR35: Vendor's can register and create accounts on the platform and vendor's can enter the business products details.

FR36: Vendors can add their new products and managing the product details including description, images, price and inventory levels.

FR37: Vendors should have main dashboard which shows important information about sales, order status and ensure accurate and up-to date information.

FR38: Verify and approve vendor registrations and monitoring the vendor's performance and compliance.

FR39: Providing the customer support through the platform, addressing the user inquiries and issues.

FR40: Ensuring the platform security and data protection and comply with relevant

regulations.

FR41: Customize the platform settings, features and add or integrate the new functionalities.

FR42: Manage the payment process and invoices and monitoring the financial transaction and revenue.

FR43: Vendors should see list of the orders placed by the customers and vendors should be able to confirm orders, pack the products and arranging for them to be delivering.

FR44: USER can select the 3d model format before uploading them and User should be able to upload 3d models to platform across platform.

- **Designer**

FR45: Designer can register and create accounts on the platform and designer should add details of them.

FR46: Designers should be able to submit their created designs to website.

FR47: Designer should provide the details about the design, including the dimensions, materials and other relevant information.

FR48: Designers have dashboard for overview of their sales, customer or vendor's Interactions, models performance and designers have access for managing their designs and sales.

FR49: Providing the integration with 3D models and allowing the designers to easily upload models.

FR50: Designers should follow to the platform guidelines, standards and allowing the

designers to easily upload models.

- **ADMIN**

FR51: Admin should be able to manages the user accounts and admin can do many tasks

like adding new users, handling account issues and to ensuring the user data is secure.

FR52: Admin manage the products on the website and admin can add new products, updating the information and handling inventory.

FR53: Admin should be able to review the order processing and manages the orders

placed by the customers and through this includes confirming the orders, tracking the

deliveries and handling the returns.

FR54: Admin can have the ability to manage and up-to-date the contents on the website

and through this includes the tasks like adding the new pages and updating the information.

FR55: Admin should be able to implement and monitoring the security measures to

protect the user data and the website and through this includes daily security checks and

addressing the any vulnerabilities.

FR56: Admin should have the ability to manage the communication on the platform and

through this could include handling customer inquiries, managing the feedback and

overseeing the reviews.

FR57: Admin should able to create and manage promotions or give discounts on the

Products and they can set the condition and durations for these offers promotion.

FR58: Admin can manage the vendor accounts and this includes admin adds new vendors,

monitoring their activities and address all issues.

FR59: Admin should handle the financial aspects, including the payment processing and Tracking and through this includes managing transactions, handling funds and ensuring the financial integrity.

FR60: Admin should be able to customize platform to meet the needs of the business and through this includes adjusting the setting, updating the layouts and making other the modifications.

FR61: Admin should ensure that the platform follows legal Policies and ethical standards and through this involves to impose the platform guidelines, privacy policies and other regulations.

### **3.4 Non-Functional Requirements**

#### **1. Performance**

System Response Time:

Ensure the tools or systems respond within acceptable time frames for users' actions.

Visualization Quality:

Maintain high-quality visual representations of designs for accurate client understanding.

#### **2. Usability:**

User-Friendly Interface:

Create an intuitive interface for easy navigation and interaction, catering to both designers and clients.

#### **3. Security:**

Data Protection:

Implement robust security measures to protect sensitive customer and vendor information within the platform.

#### **4. Scalability:**

Platform Expansion:

Design a scalable platform capable of accommodating a growing number of vendors and customers over time.

## **5. Reliability**

System Uptime:

Ensure a high level of system availability and minimize downtime to avoid disruption in service.

## **6. Cost Efficiency**

Operational Costs:

Maintain a cost-efficient system to reduce overall expenses for both customers and designers while using the platform.

## **3.5 Summary:**

As proven above, we've written all of the functional requirements using method like interviewing and brainstorming. Moreover, we've got written Non – Functional necessities of our device which we considered are have to with the aid of studying the functional necessities of the device.

## **Chapter 4:**

## **System Design**

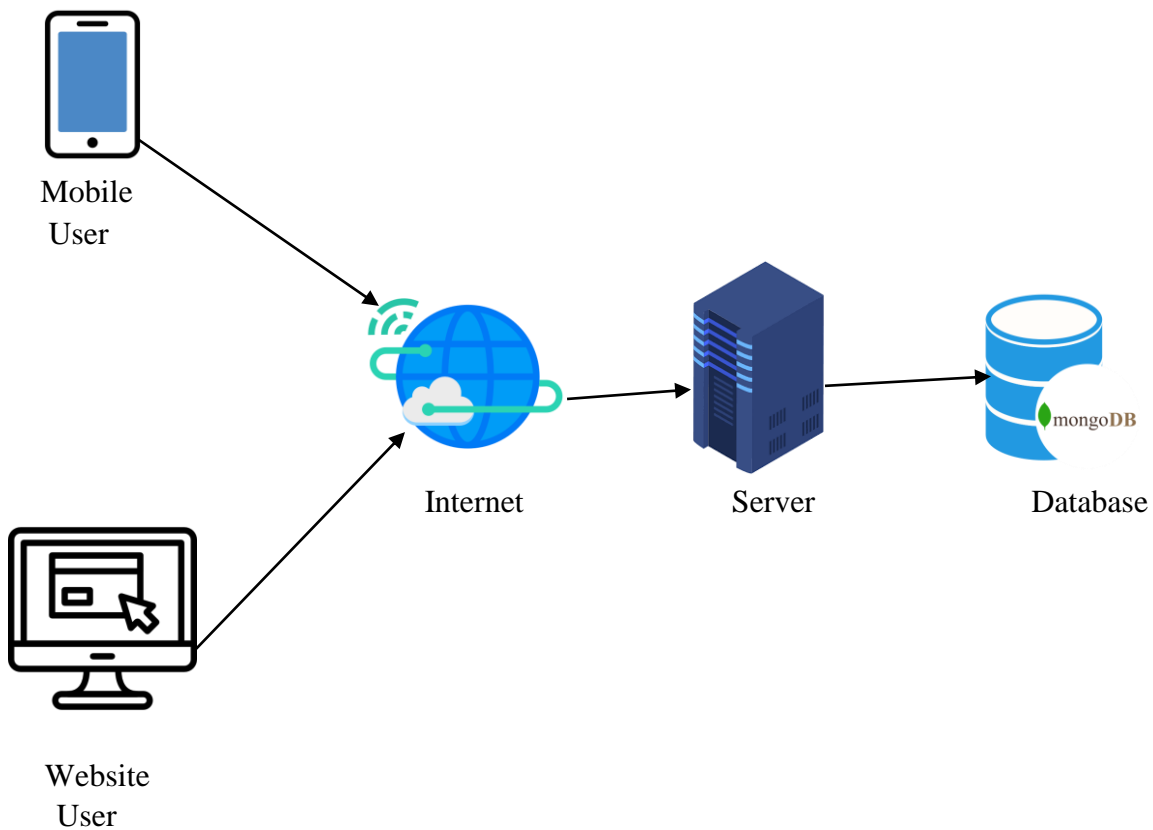


## Chapter 4: System Design

### 4.1 Introduction

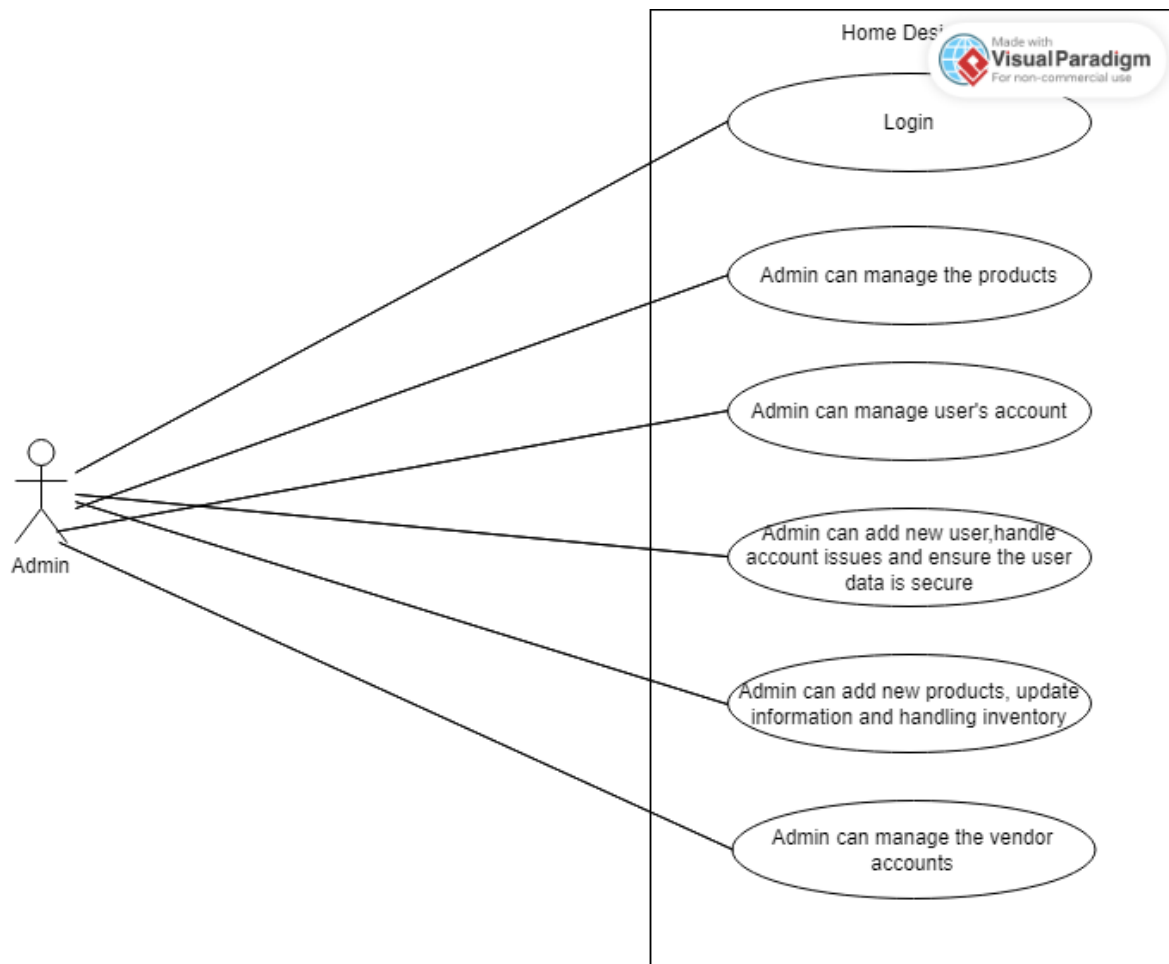
The role of a system designer involves outlining the duties, characteristics, functions, and connections of software components and also, they decide how a component should be adjusted to align with the implementation environment. The design process is guided by the requirements gathered from user input. Throughout this chapter, we will present various design diagrams, including architectural design, use case design, and activity design for our project titled "**Home Designer**." In each of these diagrams, our aim is to visually represent the workflow and technical aspects of the system design.

### 4.2 Architectural Design

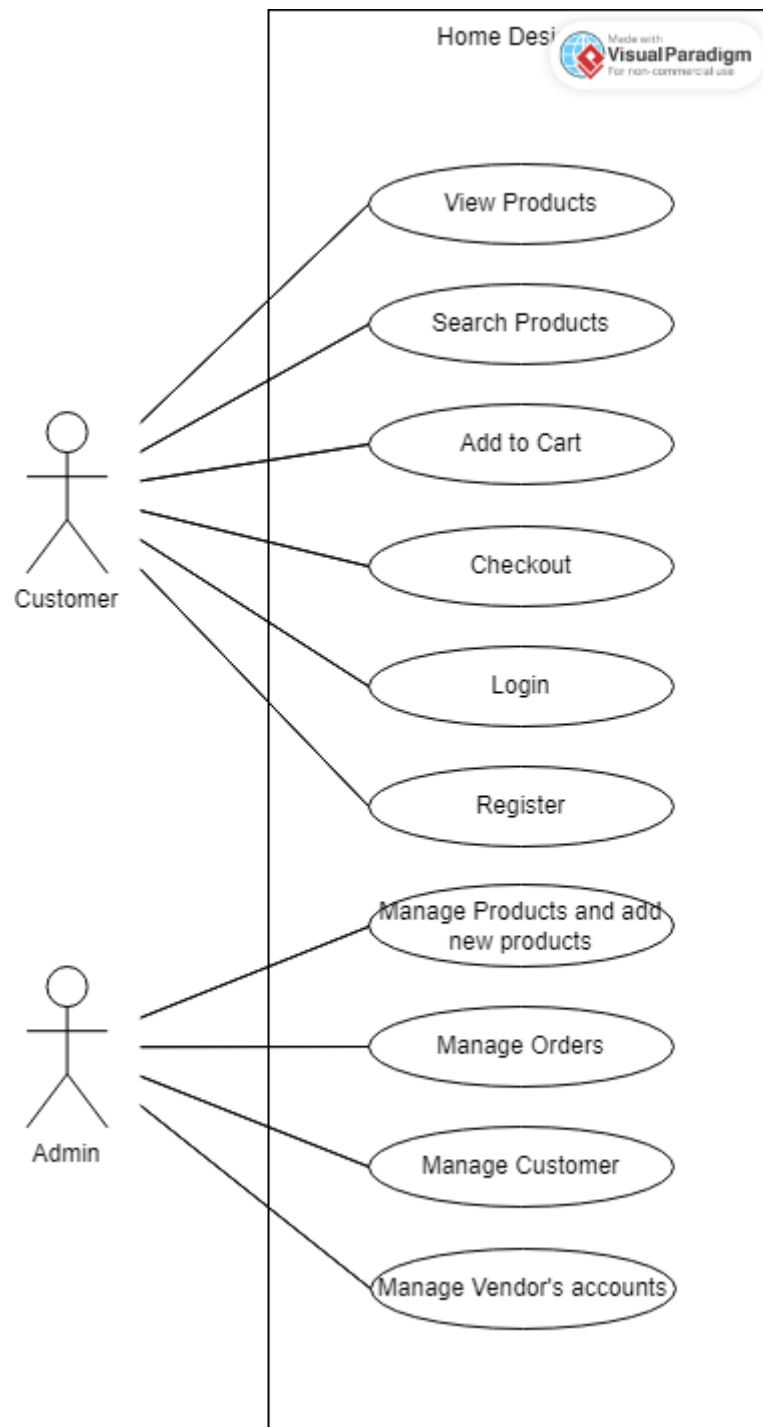


## 4.3 Detailed design

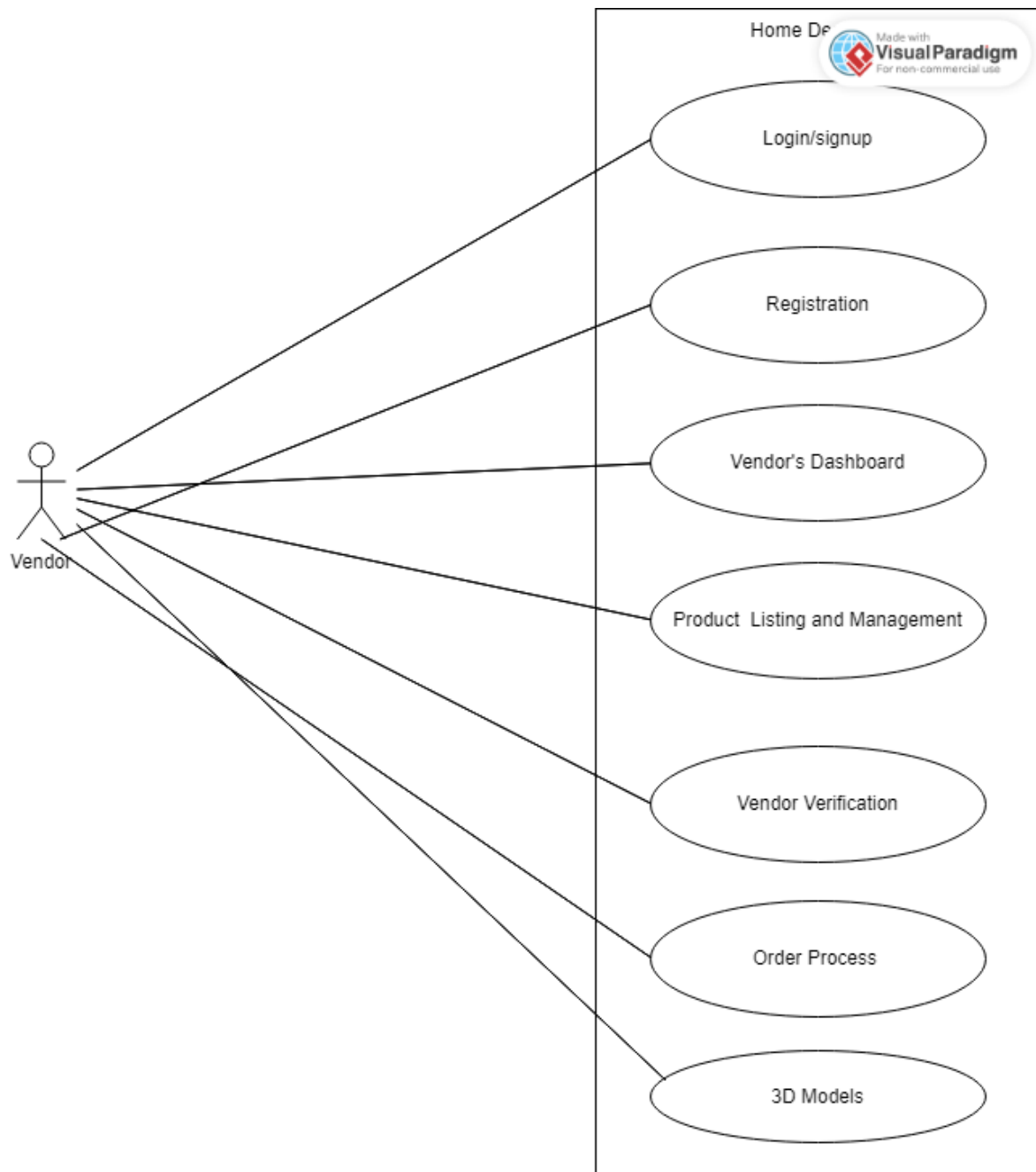
### 4.3.1: Use case for Admin:



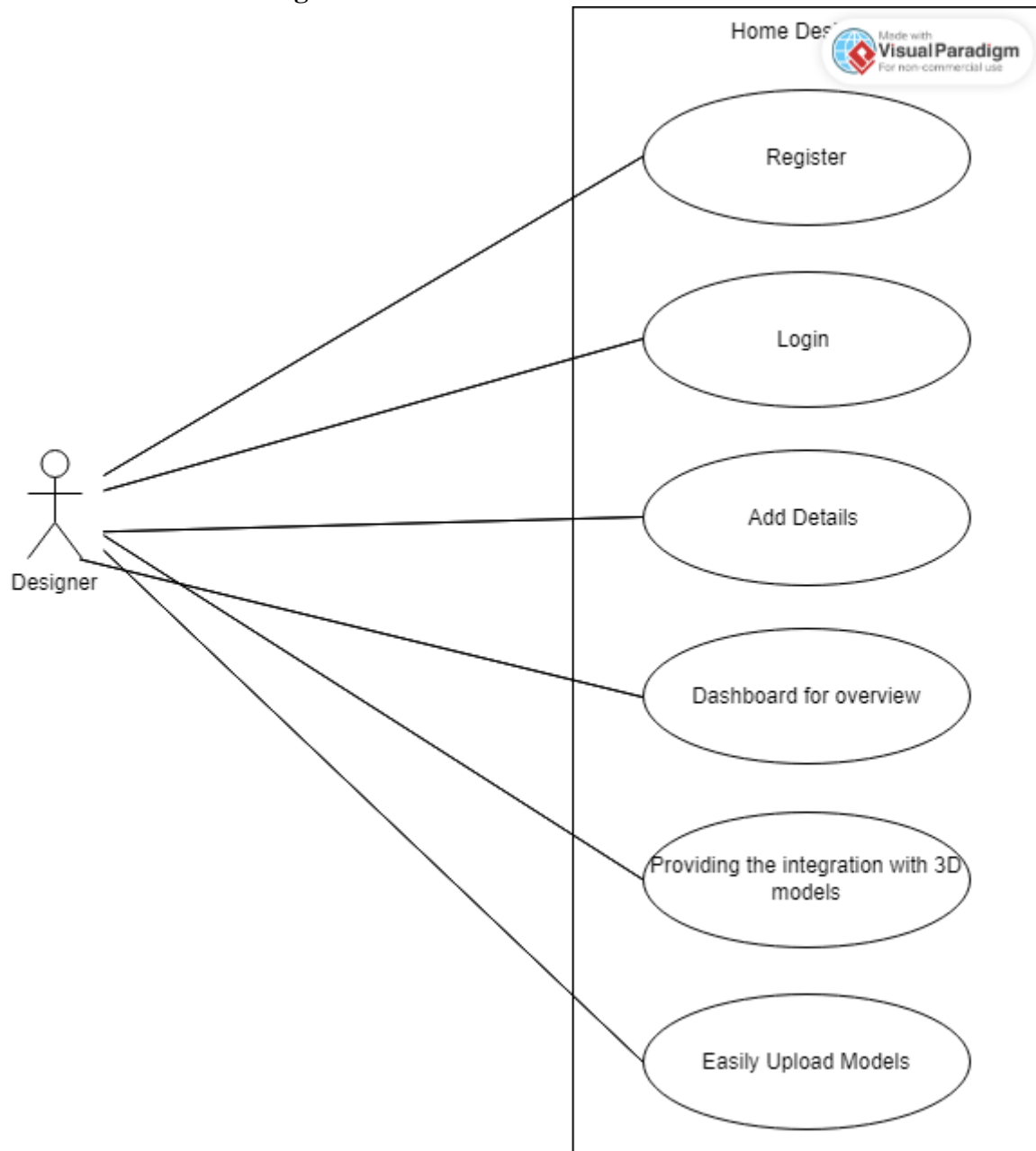
#### 4.3.2: Use Case for Admin and Customer



### 4.3.3: Use Case for Vendor



#### 4.3.4: Use Case for Designer



### 4.3.5 Use Case Fully Dressed Format

#### 4.3.5.1 Admin login

Use case ID:	UC-001
Use case:	Admin login
Description	Admin authenticates to access the admin panel.
Actors:	Admin
Preconditions:	Admin account is created
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the admin login page.</li><li>2. Admin enters the username and password.</li><li>3. Admin clicks the "Login" button.</li></ol>
Post Condition:	Admin is logged into the admin panel.

#### 4.3.5.2 User login

Use case ID:	UC-002
Use case:	User Login
Description	Users authenticate themselves to access the system.
Actors:	User
Preconditions:	none
Basic Flow:	<ol style="list-style-type: none"><li>1. User navigates to the login page.</li><li>2. User enters their username and password.</li><li>3. User clicks the "Login" button.</li></ol>
Post Condition:	User is logged in.

#### 4.3.5.3 Vendor Login

Use case ID:	UC-003
Use case:	Vendor Login
Description	Vendor authenticates to access the vendor portal.
Actors:	Vender
Preconditions:	Vendor account is created.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor navigates to the vendor login page.</li><li>2. Vendor enters the username and password.</li><li>3. Vendor clicks the "Login" button.</li></ol>
Post Condition:	Vendor is logged into the vendor portal.

#### 4.3.5.4 Designer Login

Use case ID:	UC-004
Use case:	Designer Login
Description	Designer authenticates to access the designer portal.
Actors:	Designer
Preconditions:	Designer account is created.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer navigates to the designer login page.</li><li>2. Designer enters the username and password.</li><li>3. Designer clicks the "Login" button.</li></ol>
Post Condition:	Designer is logged into the designer portal.

#### 4.3.5.5 Vender Registration

Use case ID:	UC-005
Use case:	Vendor Registration
Description	Vendor registers to become a seller on the platform.
Actors:	Vender
Preconditions:	none
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor accesses the registration page.</li><li>2. Vendor fills out registration details.</li><li>3. Vendor submits the registration form.</li></ol>
Post Condition:	Vendor account is created.

#### 4.3.5.6 Manage Product Catalog

Use case ID:	UC-006
Use case:	Manage Product Catalog
Description	Admin adds, edits, or removes products from the catalog.
Actors:	Admin
Preconditions:	Admin is logged in
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the product management section.</li><li>2. Admin adds/edit/removes a product in the catalog.</li></ol>
Alternative Flow:	<ol style="list-style-type: none"><li>2a. If the product already exists, update its information.</li><li>2b. If removing, prompt for confirmation.</li></ol>
Post Condition:	Product catalog is updated.

#### 4.3.5.7 Process Customer Orders

Use case ID:	UC-007
Use case:	Process Customer Orders
Description	Admin views and manages customer orders.
Actors:	Admin
Preconditions:	Admin is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the order management section.</li><li>2. Admin views and processes customer orders.</li></ol>
Alternative Flow:	2a. Admin can update order status, shipping information, etc.
Post Condition:	Order status is updated, and shipping is processed.

#### 4.3.5.8 Manage User Accounts

Use case ID:	UC-008
Use case:	Manage User Accounts
Description	Admin adds, edits, or removes user accounts.
Actors:	Admin
Preconditions:	Admin is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the user management section.</li><li>2. Admin adds, edits, or removes user accounts.</li></ol>
Alternative Flow:	2a. Admin can assign roles, reset passwords, or deactivate accounts.
Post Condition:	User accounts are updated.

#### 4.3.5.9 Monitor Website Analytics

Use case ID:	UC-009
Use case:	Monitor Website Analytics
Description	Admin reviews website analytics and performance metrics.
Actors:	Admin
Preconditions:	Admin is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the analytics dashboard.</li><li>2. Admin reviews various website analytics and performance metrics.</li></ol>



#### 4.3.5.10 Manage Promotions and Discounts

Use case ID:	UC-00
Use case:	Manage Promotions and Discounts
Description	Admin creates, edits, or removes promotional offers.
Actors:	Admin
Preconditions:	Admin is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Admin navigates to the promotions section.</li><li>2. Admin creates, edits, or removes promotional offers.</li></ol>
Alternative Flow:	2a. Admin sets discount percentage, duration, and eligible products.
Post Condition:	Promotions are updated.

#### 4.3.5.11 Design Product Pages

Use case ID:	UC-011
Use case:	Design Product Pages
Description	Designer creates or updates the visual design of product pages.
Actors:	Designer
Preconditions:	Designer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer accesses the product design interface.</li><li>2. Designer creates or updates product page designs.</li></ol>
Alternative Flow:	2a. Designer uploads product images and sets layout.
Post Condition:	Product pages are visually designed.

#### 4.3.5.12 Create Marketing Materials

Use case ID:	UC-012
Use case:	Create Marketing Materials
Description	Designer develops marketing materials such as banners and ads.
Actors:	Designer
Preconditions:	Designer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer navigates to the marketing materials section.</li><li>2. Designer creates banners or ads for promotions.</li></ol>
Alternative Flow:	2a. Designer selects target audience and specifies promotion details.
Post Condition:	Marketing materials are created.

#### 4.3.5.13 Customize Email Templates

Use case ID:	UC-013
Use case:	Customize Email Templates
Description	Designer customizes email templates for promotional campaigns.
Actors:	Designer
Preconditions:	Designer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer accesses the email template customization section.</li><li>2. Designer customizes email templates.</li></ol>
Alternative Flow:	2a. Designer adds promotional content, images, and sets the template style.
Post Condition:	Email templates are customized.

#### 4.3.5.14 Collaborate with Developers

Use case ID:	UC-014
Use case:	Collaborate with Developers
Description	Designer collaborates with developers to implement design changes.
Actors:	Designer , Developer
Preconditions:	Designer and developer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer communicates design changes to developers.</li><li>2. Designer and developers collaborate to implement changes.</li></ol>
Alternative Flow:	2a. Designer provides design specifications and assets to developers.
Post Condition:	Design changes are implemented successfully.

#### 4.3.5.15 Review User Feedback

Use case ID:	UC-015
Use case:	Review User Feedback
Description	Designer reviews user feedback on design elements.
Actors:	Designer
Preconditions:	Designer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Designer accesses the user feedback section.</li><li>2. Designer reviews user comments and suggestions.</li></ol>
Post Condition:	Design improvements are identified.

#### 4.3.5.16 Browse Product Catalog

Use case ID:	UC-016
Use case:	Browse Product Catalog
Description	Customer explores the product catalog.
Actors:	Customer
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer navigates to the product catalog.</li><li>2. Customer browses and filters products.</li></ol>
Post Condition:	Customer finds products of interest.

#### 4.3.5.17 Search for a Product

Use case ID:	UC-017
Use case:	Search for a Product
Description:	Customer searches for a specific product.
Actors:	Customer
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer uses the search bar to enter a product name.</li><li>2. Customer reviews search results.</li></ol>
Alternative Flow:	2a. If the desired product is found, customer proceeds to view details.
Post Condition:	Customer finds and views the desired product.

#### 4.3.5.18 View Product Details

Use case ID:	UC-018
Use case:	View Product Details
Description:	Customer looks at the details of a product.
Actors:	Customer
Preconditions:	Product is visible in the catalog or search results.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer clicks on a product to view details.</li><li>2. Customer reviews product specifications and images.</li></ol>
Post Condition:	Customer gathers information about the product.

#### 4.3.5.19 Add Product to Cart

Use case ID:	UC-019
Use case:	Add Product to Cart
Description:	Customer adds a product to the shopping cart.
Actors:	Customer
Preconditions:	Product details are visible, and customer is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer clicks the "Add to Cart" button.</li><li>2. Customer selects quantity and options.</li></ol>
Alternative Flow:	2a. If the product has options (size, color), customer selects preferences.
Post Condition:	Product is added to the shopping cart.

#### 4.3.5.20 Proceed to Checkout

Use case ID:	UC-020
Use case:	Proceed to Checkout
Description:	Customer initiates the checkout process.
Actors:	Customer
Preconditions:	Products are added to the shopping cart.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer clicks the "Proceed to Checkout" button.</li><li>2. Customer enters shipping and billing information.</li></ol>
Alternative Flow:	2a. Customer selects shipping method and payment option.
Post Condition:	Order details are confirmed before payment.

#### 4.3.5.21 Make a Purchase

Use case ID:	UC-0017
Use case:	Make a Purchase
Description:	Customer completes the purchase transaction.
Actors:	Customer
Preconditions:	Checkout process is initiated.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer reviews the order summary.</li><li>2. Customer confirms the purchase.</li><li>3. Customer enters payment details and completes the transaction.</li></ol>
Post Condition:	Order confirmation is displayed.

#### 4.3.5.22 Track Order

Use case ID:	UC-022
Use case:	Track Order
Description:	Customer tracks the status of a placed order.
Actors:	Customer
Preconditions:	A purchase has been made.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer navigates to the order tracking section.</li><li>2. Customer enters the order number or uses account history.</li></ol>
Post Condition:	Order status and tracking information are viewed.

#### 4.3.5.23 Provide Product Feedback

Use case ID:	UC-023
Use case:	Provide Product Feedback
Description:	Customer provides feedback on purchased products.
Actors:	Customer
Preconditions:	A purchase has been made.
Basic Flow:	<ol style="list-style-type: none"><li>1. Customer navigates to the product feedback section.</li><li>2. Customer submits a review or rating for purchased products.</li></ol>
Post Condition:	Feedback is recorded for the purchased products.

#### 4.3.5.24 Manage Product Listings

Use case ID:	UC-024
Use case:	Manage Product Listings
Description:	Vendor adds, edits, or removes products from their catalog.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor navigates to the product management section.</li><li>2. Vendor adds, edits, or removes products from their catalog.</li></ol>
Alternative Flow:	2a. Vendor updates product information, pricing, or availability.
Post Condition:	Product catalog is updated.

#### 4.3.5.25 Process Orders

Use case ID:	UC-025
Use case:	Process Orders
Description:	Vendor views and manages customer orders for their products.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor accesses the order management section.</li><li>2. Vendor views and processes customer orders for their products.</li></ol>
Alternative Flow:	2a. Vendor confirms order details, packs products, and updates order status.
Post Condition:	Order status is updated, and products are prepared.

#### 4.3.5.26 Manage Inventory

Use case ID:	UC-026
Use case:	Manage Inventory
Description:	Vendor monitors and updates product inventory levels.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor navigates to the inventory management section.</li><li>2. Vendor reviews current inventory levels and updates them.</li></ol>
Alternative Flow:	2a. Vendor adds new stock, adjusts quantities, or marks items as out of stock.
Post Condition:	Inventory levels are updated.

#### 4.3.5.27 Monitor Sales Performance

Use case ID:	UC-027
Use case:	Monitor Sales Performance
Description:	Vendor analyzes sales data and performance metrics.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor accesses the sales analytics dashboard.</li><li>2. Vendor reviews sales data, trends, and customer feedback.</li></ol>
Post Condition:	Vendor gains insights into sales performance.



#### 4.3.5.28 Communicate with Customers

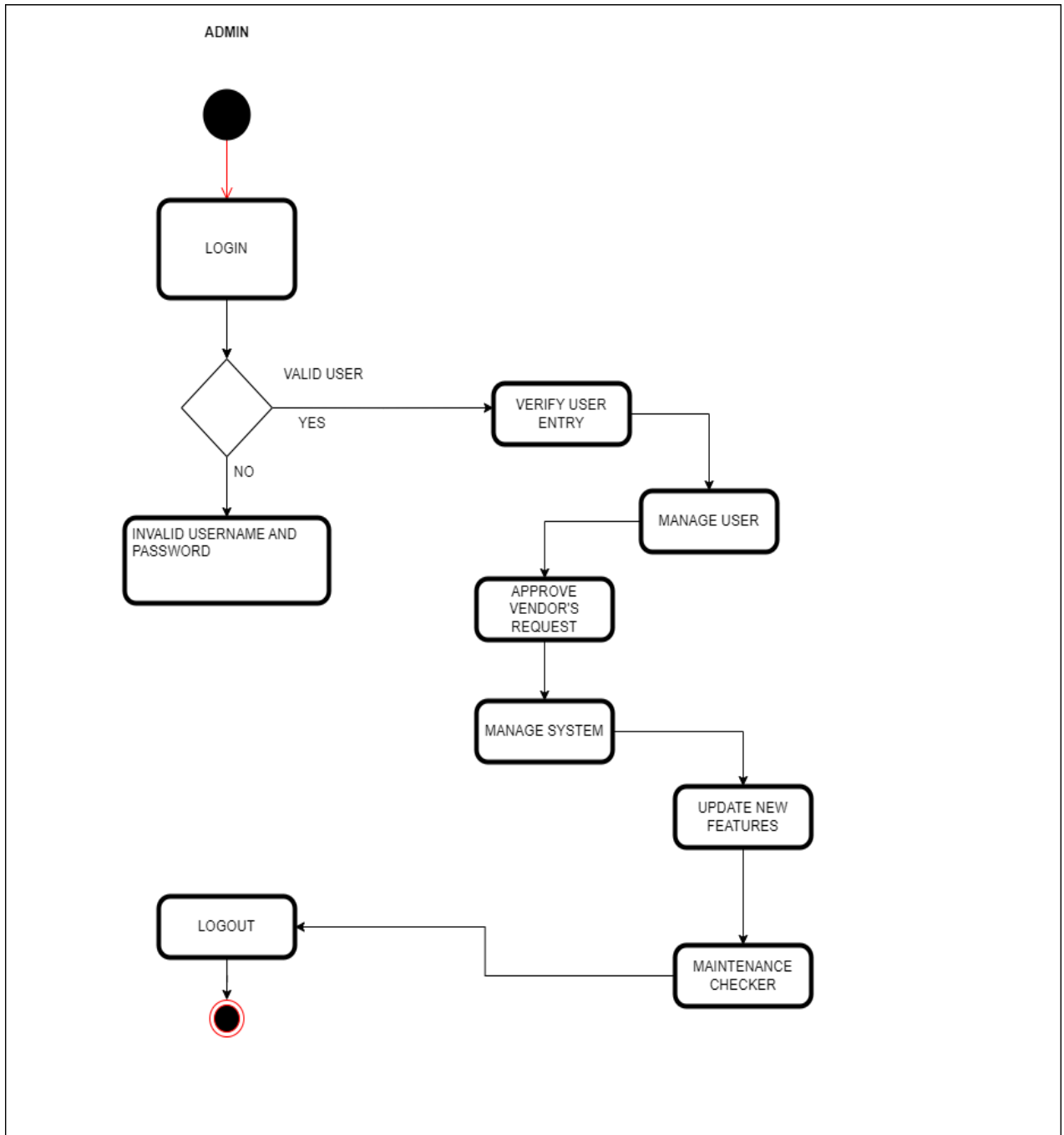
Use case ID:	UC-028
Use case:	Communicate with Customers
Description:	Vendor communicates with customers regarding products.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor accesses the customer communication section.</li><li>2. Vendor responds to customer inquiries or issues.</li></ol>
Post Condition:	Vendor communicates effectively with customers.

#### 4.3.5.29 Set Promotions and Discounts

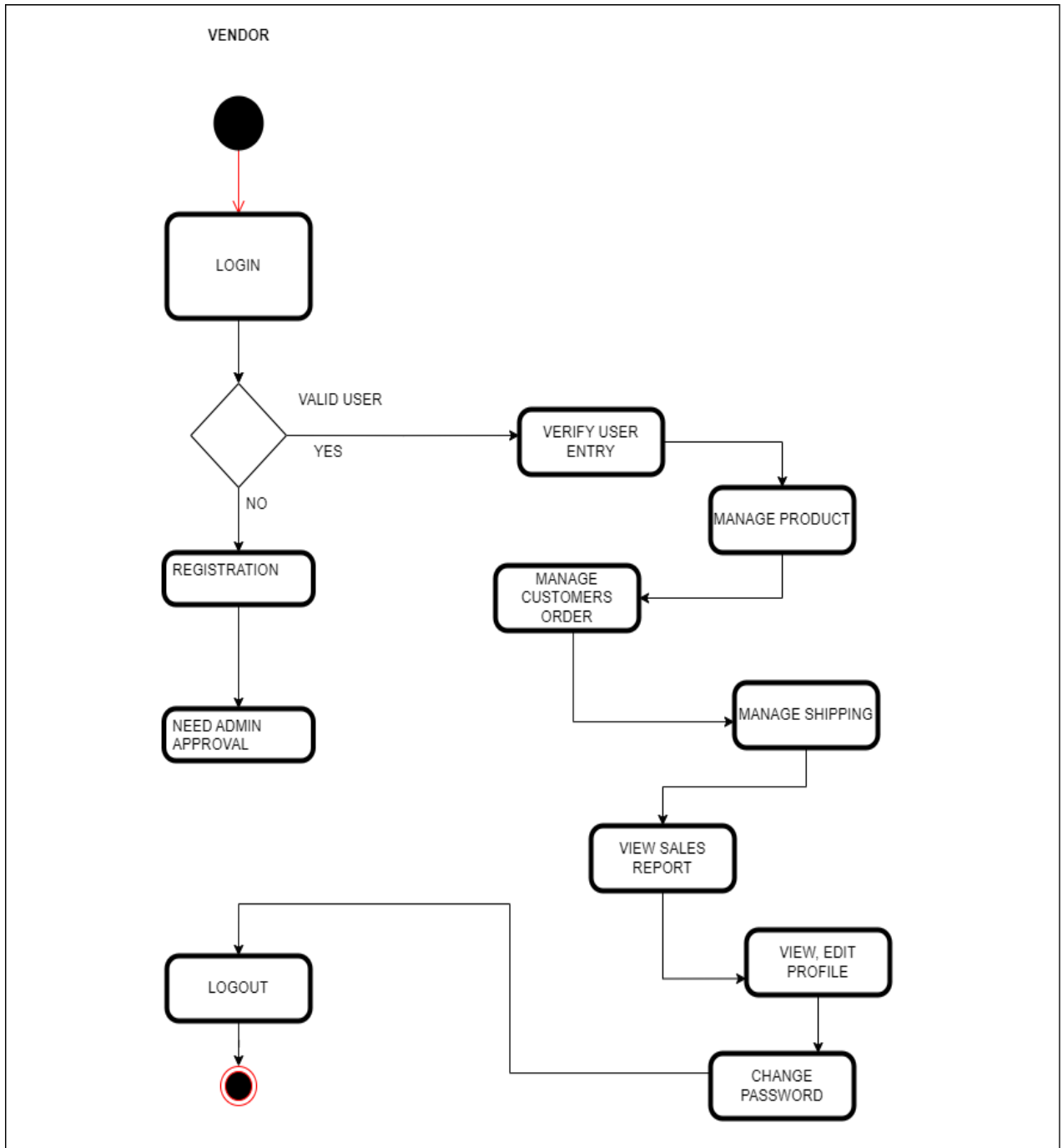
Use case ID:	UC-029
Use case:	Set Promotions and Discounts
Description:	Vendor creates, edits, or removes promotional offers.
Actors:	Vendor
Preconditions:	Vendor is logged in.
Basic Flow:	<ol style="list-style-type: none"><li>1. Vendor navigates to the promotions section.</li><li>2. Vendor sets up, edits, or removes promotional offers for their products.</li></ol>
Alternative Flow:	2a. Vendor specifies discount percentages, promotion duration, and eligible items.
Post Condition:	Promotions are applied to the products.

### 4.3.6 Activity Diagrams

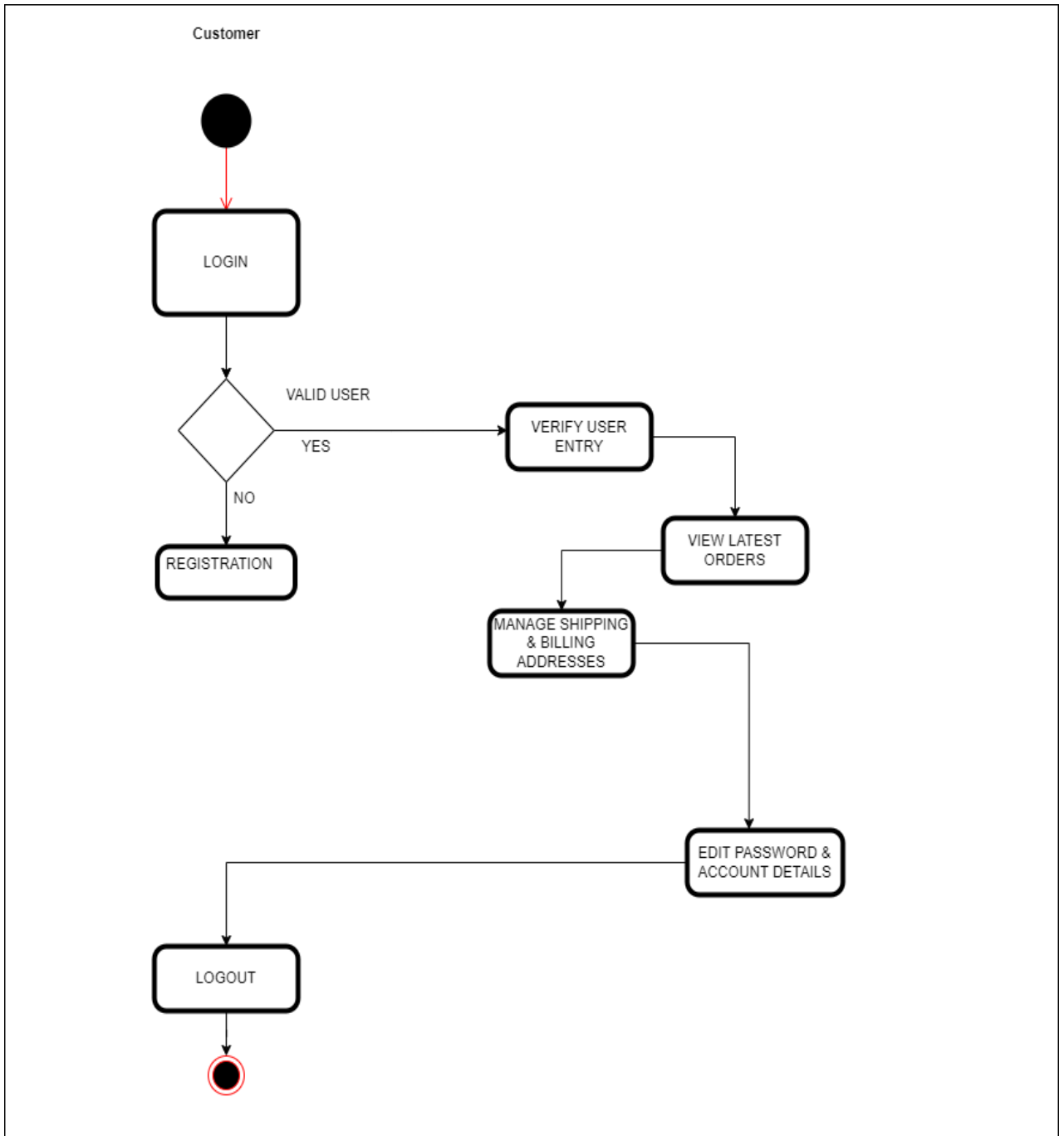
#### Admin



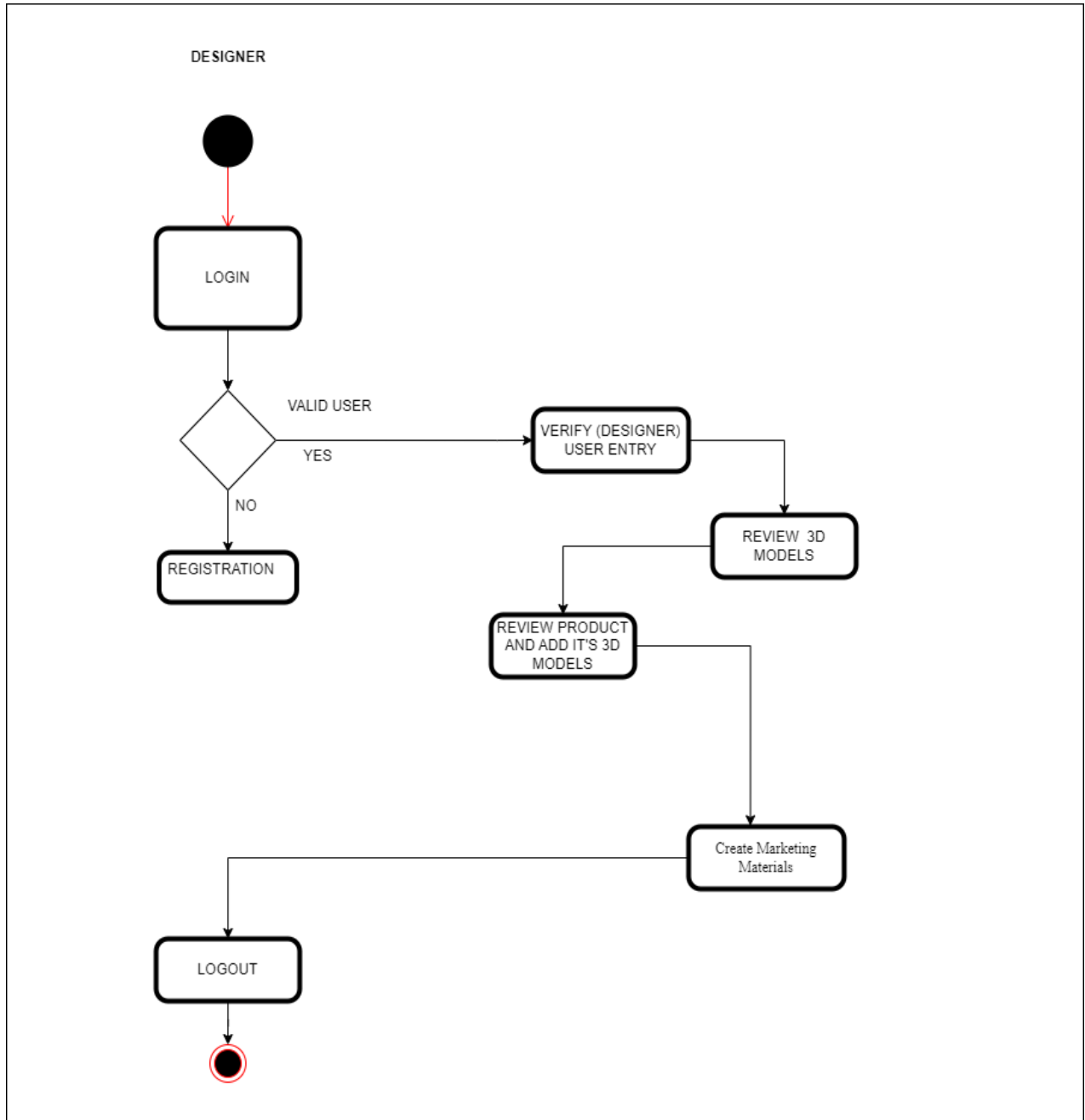
## Vendor



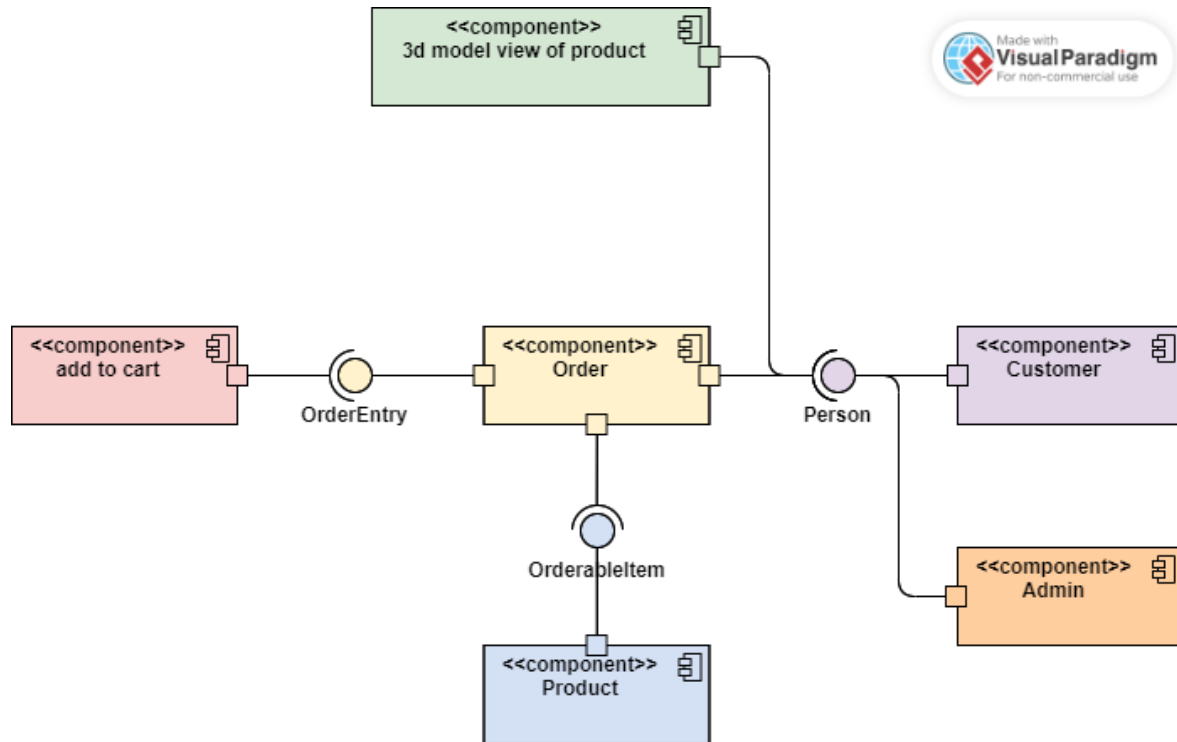
## Customer



## Designer



### 4.3.7 Component Diagram



### 4.3.8 Data Base Design

### 4.3.9 Summary

In this chapter, we presented design diagrams, including architectural design, use case design, activity design, and sequence diagrams for our project "Home Designer." Throughout these diagrams, we aimed to illustrate the workflow and technical structure of our "Home Designer" system. The comprehensive system design facilitated a thorough exploration and comprehension of the nuanced elements of our project.

## **Chapter 5: Implementation**

## **Chapter 5:**

### **Implementation**

#### **5.1 Endeavour (Team + Work + Way of Working)**

##### **5.1.1 Team**

- Malik Muhammad Farhad Ashraf
- Usama Hussain

##### **5.1.2 Work Breakdown Structure**

###### **1. Project Management**

1.1. Work Breakdown Structure (WBS)

1.2. Roles & Responsibility Matrix

1.3. Change Control System

###### **2. Reports / Documentation**

2.1. Team Members and Project Proposal

2.2. Project Proposal Document

2.2.1. Opportunities and Stakeholders

2.2.2. Existing Systems

2.2.3. Problem Statement

2.2.4. Proposed Solution

2.2.5. Project Scope

2.3. Proposal Plan

2.3.1. Change Record

2.3.2. List of faculties proposed changes

2.3.3. Work Breakdown Structure

2.4. Process Document

2.4.1. Estimate Documentation

2.5. Planning Document

2.5.1. Problem the Software will solve

2.5.2. The development approach the team will use

2.5.3. The Primary Function of the Software



- 2.5.4. The Order of Development
- 2.5.5. Leadership Roles for the Project
- 2.5.6. Each Team Member's Responsibilities
- 2.6. Scheduling Documentation
- 2.7. Technical Documentation
- 2.8. Final Documentation Introduction
- 2.9. Literature / Market Survey
  - 2.9.1. Surveys
  - 2.9.2. Interviews
  - 2.9.3. Brainstorming
  - 2.9.4. Customer observation
  - 2.9.5. Stand-Alone Literature review
  - 2.9.6. Literature review as section within a document
- 2.10. Requirements Analysis
  - 2.10.1. Elicited Requirements
  - 2.10.2. Business Requirements
  - 2.10.3. Functional Requirements
  - 2.10.4. Non-Functional Requirements
  - 2.10.5. Stakeholder Requirements
- 2.11. System Design
  - 2.11.1. Interface Design
    - 2.11.1.1. Graphical User Interface
    - 2.11.1.2. Menu-Driven User Interface
    - 2.11.1.3. Form-Based User Interface
    - 2.11.1.4. Touch User Interface
  - 2.11.2. Architectural Design
  - 2.11.3. Use Cases
  - 2.11.4. Component Diagram
  - 2.11.5. Deployment Diagram

- 2.11.6. Activity Diagrams
- 2.12. Implementation
- 2.13. Testing & Performance Evaluation
  - 2.13.1. System Testing
  - 2.13.2. Load Testing
- 2.14. Conclusion & Outlook
- 2.15. End User Documentation
  - 2.15.1. Training Manuals
  - 2.15.2. User Manuals
  - 2.15.3. Release Notes
  - 2.15.4. Installation Guides
  - 2.15.5. Troubleshooting Tips
- 2.16. Application Administration Documentation
- 2.17. System Administrator Documentation
  - 2.17.1. Information on Software Installation
  - 2.17.2. Updates
  - 2.17.3. Functionality
- 3. System
  - 3.1. Development Environment
    - 3.1.1. IDE (VS Code)
    - 3.1.2. Version Control
    - 3.1.3. Server
    - 3.1.4. Database
      - 3.1.4.1. User information

## **5.2 Flow Control/Pseudo codes**

## **5.3 Components, Libraries, Web Services and stubs**

## **5.4 IDE, Tools and Technologies**

## **5.5 Best Practices / Coding Standards**

### **5.5.1 Software Engineering Practices**

### **5.5.2 Development Practices & Standards**

## **5.6 Deployment Environment**

## **5.7 SQA activities: Defect Detection**

### **5.7.1 Test Case Design (White box)**

## **5.8 Summary**