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1. Introduction

1.1 Purpose

The purpose of this document is to outline the requirements for the development of SimpleFocals E-commerce web application. The web application will be the entry point where customers can browse SimpleFocals range of eyewear, add items to a cart and complete their purchases. The intended customers for SimpleFocals are people who have miopic(short-sighted) prescriptions and are looking for a cost effective alternative to the eyewear sold in Irish high street stores or online.

1.2 Project Scope

- The web application will facilitate, a customer from registering with the system until the end point of purchasing items in SimpleFocals range of eyewear.
- The web application will facilitate an administrator's access to the mange the application. The administrators should be able to add products in SimpleFocals range.

Out of Scope:

- The web application will not support numerous types of payment processing.
- Adding tax to the products at checkout(later revisions this will be added).
- In the initial version of the web application will not have reviews from customers about purchased products although future updates will facilitate this functionality.

Motivation for this Project:

The motivation for this project is to provide the Irish prescription glass wearing consumer a cost effective alternative to existing eyewear vendors.

Project Objectives:

The project aims to deliver these functions for users of the web application.

Customers will be able to:

- Browse SimpleFocals range of eyewear.
- Register with the system.

Registered-Customers will be able to:

- Upload their eye prescription to the system

- Add product to a cart.

- Purchase a product.

Administrators will be able to :

- Add products on the site.

Project Expectations:

At the completion of this project, the web application has the basis for a fully functioning E-Commerce web application although the system will not be ready for commercial use initially.

Project Suppositions and Restrictions:

Receiving feedback from market research during the planning stage can be limited as we have a small window of time before the project has to move on to the development stage. Therefore the sample size of the market research could be smaller than expected.

Project Risks and Contingency Plan:

The main risk to the project is time constraints for implementing all the features and completing all the documentation required to a high standard. In order to accomplish this, during the project lifecycle, some features are open to modification in order to meet the required milestones and deadlines.

1.3 Definitions, Acronyms and Abbreviations

User: The user of the system refers to the Customer and the Administrator

Customer: Registered Customer and Non-Registered Customer

Administrator: A User that has special privileges to modify products on the system

E-Commerce: Is shorthand for Electronic Commerce

URL: Uniform Resource Locator, it is the browsers mechanism to retrieve a published resource on the internet.

PDF: A standard file format for digital documents, originally developed by Adobe.

JPEG: A compressed file format for images.

CMS: Content Management System

2. User Requirements Definition

This section outlines the requirements a user must have in order to use the web application.

• Internet Browser: The web application can be interfaced using the browser.

• Internet Connection: The user will require access to internet connectivity in order to interact with the web application through the browser

• Computing Device: The computing device (computer/laptop, tablet or smartphone) should have access to an active internet connection and internet browser.

3. Requirements Specification

This section outlines all of the functional requirements that the web application should accomplish and also describe the main details of the system and how the Users interact with the system. Non-functional requirements shall also be investigated.

3.1 Functional Requirements

The functional requirements describes what the system must be able to accomplish. The requirements are ranked in terms of priority (*1 = highest priority*).

1.   Customer is able view SimpleFocals range of eyewear.
2.   Non-registered customer is able to register with the system.
3.   User is able to login to the system.
4.   Registered customer is able add to item/s to cart.
5.   Registered customer is able to upload a digital copy of their eye prescription.
6.   Registered customer's payment is able to be processed.
7.   Administrator is able to add products.

3.1.1 Top Level Use Case Diagram

The use case diagram outlines the actors and how they interact with the system. SimpleFocals System is described below(*fig3.1*).
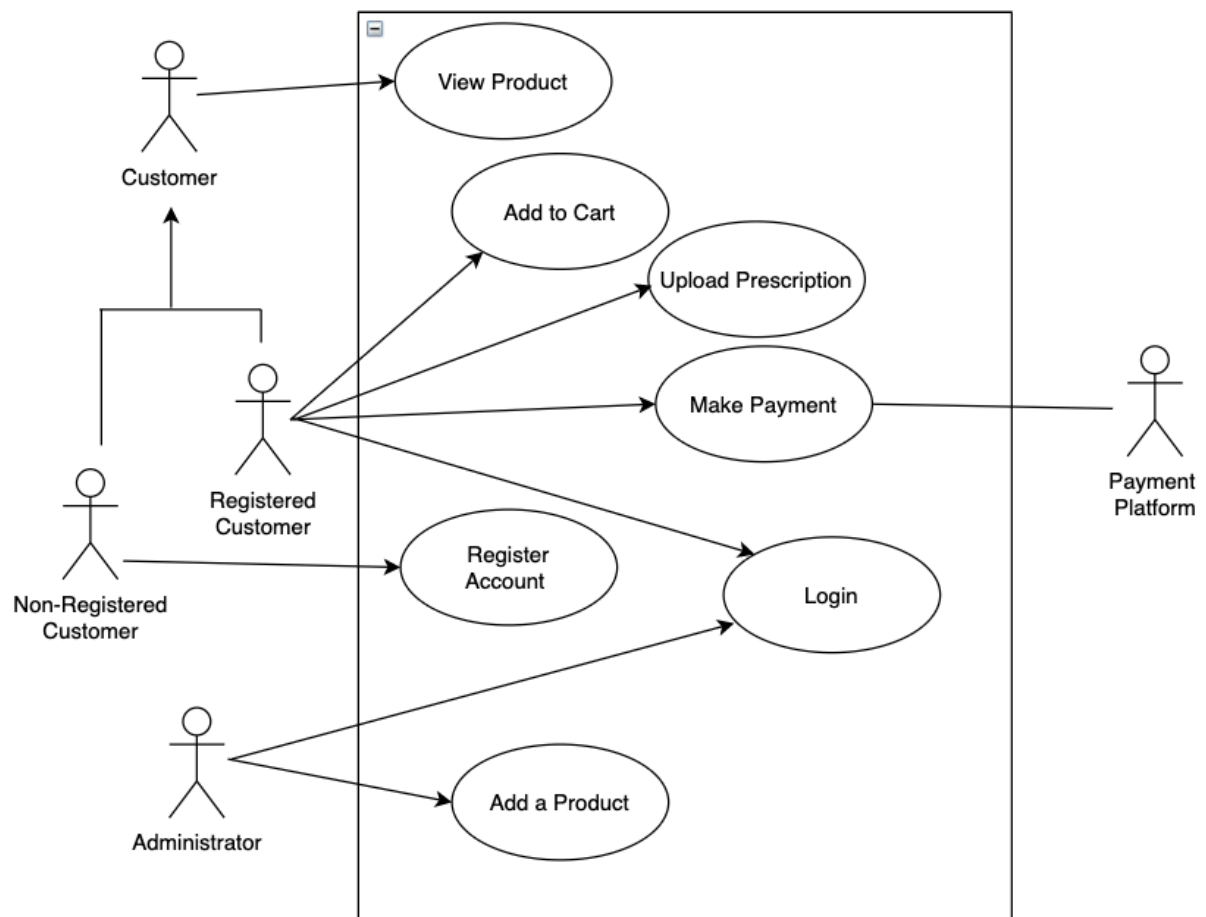
fig3.1: Top Level Use-Case Diagram for SimpleFocals System

3.1.2. Requirement 1: A customer is able view SimpleFocals range of eyewear.

Use Case: View Product (*fig3.2*)
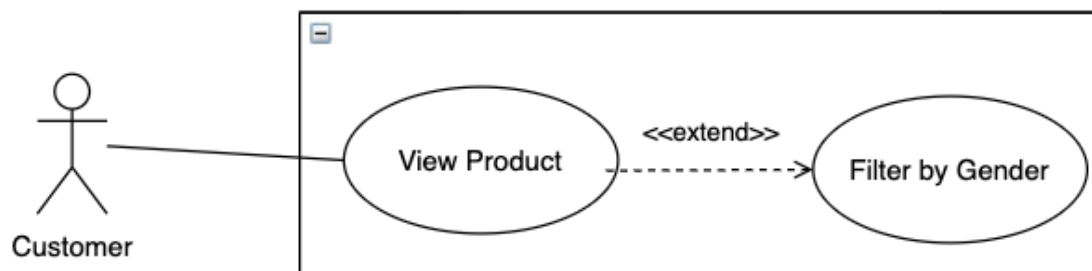

fig3.2: Requirement 1 use-case - customer views product

Name	View Product
Description	The customer views SimpleFocals range of different eyewear products.
Priority	This use-case is of high **priority 1** because it is the starting point for potential sales in the E-commerce application.
Precondition	None
Flow Description	
Activation	This use case can be activated on the any page of the web application. The customer clicks on the products tab on the persistent navigation bar.
Main Flow	1. The customer clicks on the products tab. 2. The system displays the all the product items. 3. The customer selects the category male or female glasses. 4. The system displays the all products for that gender. 5. The customer selects a specific product. 6. The system displays a detailed view of the product.
Alternate Flow	
Title	**Description**
Customer enters direct URL	A1. The customer enters into the web browser address field: *{the web. site URL}/products* A2. The main flow from 2 is continued.
Exceptional Flow	
Title	**Description**
Post-Condition	
Title	**Description**
Termination	When the customer leaves the product page the use-case has ended

3.1.3. Requirement 2: A non-registered customer is able to register with the system.

Use Case: Register Customer(*fig3.3*)

fig3.3: Requirement 2 use-case - Register Customer

Name	Register Customer
Description	A non-registered customer registers with the system.
Priority	This use-case is of **priority 2** because the system requires the customer to be registered before making any purchases.
Precondition	The customer has not previously registered with the system.
Flow Description	
Activation	This use case is activated when the customer navigates to the sign-in/register page. The customer selects the register option.
Main Flow	1. The customer selects the option register. 2. The system displays fields that have to be entered by the Customer(First Name, Last Name, Gender, Date of Birth, Email Address and Password) 3. The customer enters the required fields and then selects the submit option. 4. The system displays that registration is successful.
Alternate Flow	
Title	**Description**

Email previously registered	A1. The customer tries to register an email address that has been previously registered to the system.
	A2. The system displays the email address already exists on the system. The system indicates to change the email address.
	A3. The system continues from main flow 3.

Exceptional Flow	
Title	**Description**

Post-Condition	
Title	**Description**
Termination	The system displays registration is successful.

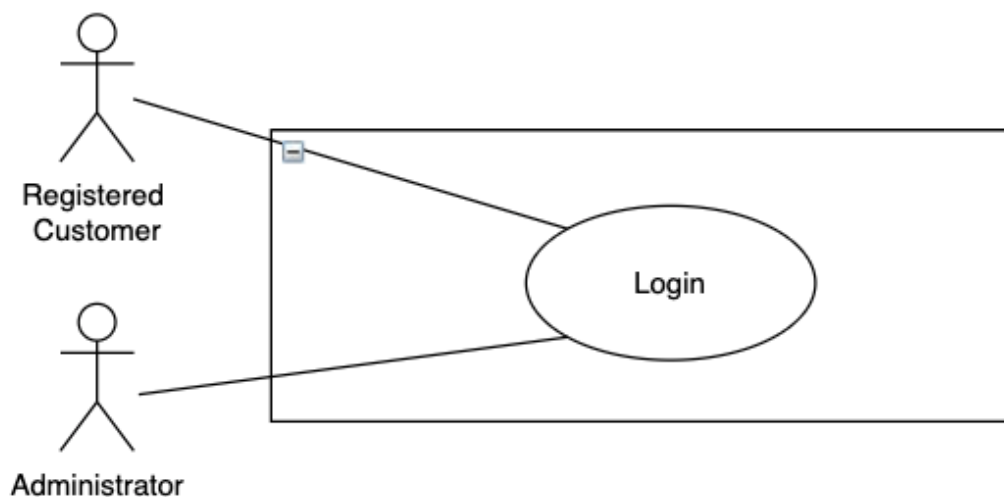### 3.1.4. Requirement 3: A user is able to login to the system.

Use Case: Login (*fig3.4*)

fig3.4: Requirement 6 use-case - Login

Name	Login (Customer)
Description	A registered customer logins into the system.
Priority	This use-case is of **priority 3** because the system requires a login function for customer and administrator.
Precondition	1. The customer has previous registered on the system. 2. The administrator has an account on the system.
Flow Description	
Activation	This use case is started when the customer navigates to the sign-in/ register page. The customer selects the sign-in option.
Main Flow	1. The system displays the input fields Email Address and Password. 2. The customer enters the required fields and then selects the submit option. 3. The system signs-in the customer.
Alternate Flow	
Title	**Description**
User fails authentication	A1. The customer enters an email address incorrectly or enters a password that doesn't correspond to a given email address A2. The system prompts the customer to correct the fields entered. A3. The system continues from main flow 2.
Exceptional Flow	
Title	**Description**
Post-Condition	
Title	**Description**
Termination	The customer is redirected to a homepage for their account.

Name	Login (Administrator)
Description	An administrator logins into the system.
Priority	This use-case is of **priority 6** because the system requires a login function administrator to access the CMS.
Precondition	1. The administrator has an account on the system.
Flow Description	
Activation	This use case is started when administrator navigates to the sign-in/ register page. The system displays the sign-in option.
Main Flow	1. The system displays the input fields Email Address and Password. 2. The administrator enters the required fields and then confirms the selects the submit option. 3. The system signs-in the administrator.
Alternate Flow	
Title	**Description**
User fails authentication	A1. The administrator enters an email address incorrectly or enters a password that doesn't correspond to a given email address A2. The system prompts the administrator to correct the fields entered. A3. The system continues from main flow 2.
Exceptional Flow	
Title	**Description**
Post-Condition	
Title	**Description**
Termination	The system displays the administrator homepage.

3.1.5. Requirement 4: A registered customer is able add to item/s to cart.
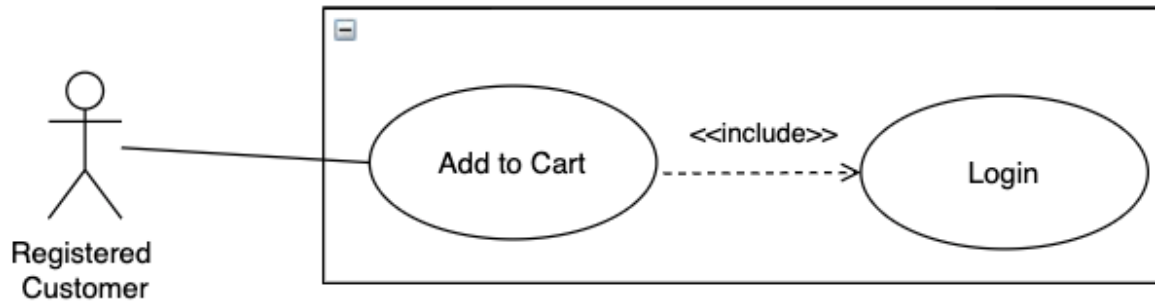
Use Case: Add to Cart(*fig3.5*)

fig3.5: *Requirement 4 use-case - Add to Cart*

Name	Add to Cart
Description	The registered customer adds products to the cart
Priority	This use-case is of **priority 4** because adding to the cart is the next step in the purchase process after signing into the system.
Precondition	The customer has registered and logged into the system.
Flow Description	
Activation	This use case is activated on the products page of the web application. The registered customer has clicked on a more detailed view of the product.
Main Flow	1. The customer selects the quantity of the product. 2. The system displays the updated quantity of the product. 3. The customer clicks on add to cart option.
Alternate Flow	
Title	**Description**

Exceptional Flow	
Title	**Description**
Product out of Stock	The product may be out of stock. Even though the customer selects add to cart, the system notifies the customer that product is out of stock.
Post-Condition	
Title	**Description**
Termination	The item is added, the customer continues to browse products or goes to make a payment.

3.1.6. Requirement 5: A registered customer is able to upload a digital copy of their eye prescription.
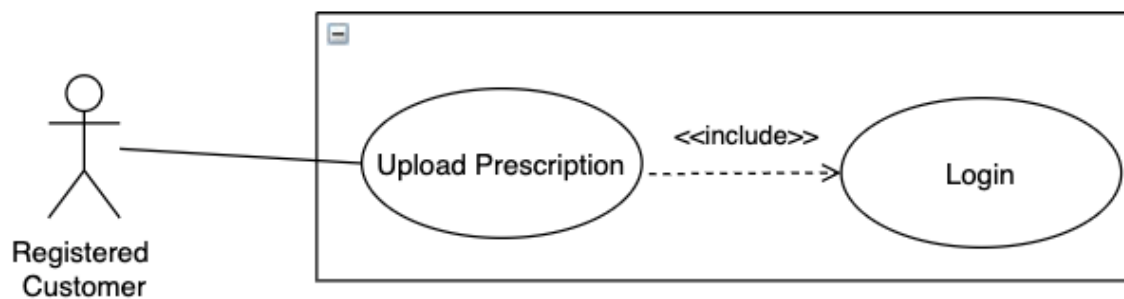
Use Case: Upload Prescription (*fig3.6*)

fig3.6: Requirement 3 use-case - customer uploads eye prescription to the system

Name	Upload Prescription
Description	The registered customer uploads their eye prescription to the system.
Priority	This use-case is of **priority 5** because it is next in the purchase flow of events.

Precondition	1. The customer has registered with the system. 2. The customer has a valid prescription in a compatible format (pdf or jpeg)
Flow Description	
Activation	This use case is activated on the customer's account tab of the web application(accessible from the persistent navigation bar at the top of the website.). The registered customer can view their own details along with the option to upload their prescription.
Main Flow	1. The system displays the customer's personal account information. 2. The customer selects the option to upload their prescription. 3. The system displays a new file browser window to the customer where they can search the location of the prescription locally on their computing device. 4. The customer selects the prescription file with compatible format. 5. The customer selects the upload file option. 6. The system displays the file was uploaded successfully.
Alternate Flow	

Title	Description
Make payment without prescription	A1. The customer is at the check-out page but has not uploaded a valid prescription. The customer selects pay now. A2. The system displays notice a valid prescription is needed. The system redirects to customer's personal account information page. A3. Main flow from 2 is continued.

Exceptional Flow	

Title	Description

Post-Condition	

Title	Description
Termination	The system displays the prescription file was uploaded successfully.

3.1.7. Requirement 6: Registered customer's payment is able to be processed.

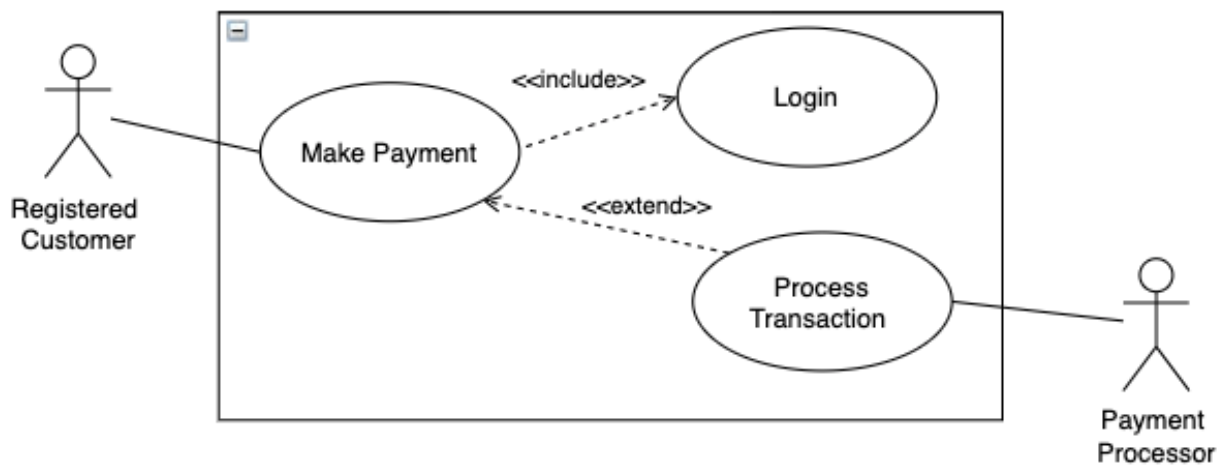### 3.1.7.1. Use Case: Make Payment (*fig3.7*)

fig3.7: Requirement 4 use-case - Makes payment

Name	Make Payment
Description	The registered customer is at checkout and pays for the products in the cart.
Priority	This use-case is of **priority 6** because this is the final stage of the purchase process for the customer.
Precondition	1. The customer has registered and logged into the system. 2. The customer has uploaded a valid prescription in a compatible format (pdf or jpeg). 3. The customer has added product/s to the cart. 4. The customer has navigated to the cart items.
Flow Description	
Activation	This use case is started when the customer selects the pay now option on the checkout page of the web application.

Main Flow	1. The customer selects the pay now option from the checkout page.
	2. The system will load a payment page.
	3. The customer will enter their payment details(credit/debit card number, card expiration date and card verification value) and
	4. The customer will select confirm transaction.
	5. The system will display the payment has been successful.

Alternate Flow	
Title	Description

Exceptional Flow	
Title	Description
Invalid payment details	A1. If the customer enters invalid card details the system displays the payment is not accepted and indicates the error.
	A2. The customer is then promoted to correct the payment information entered.

Post-Condition	
Title	Description
Termination	The customer will be notified that the payment was successful and the system will redirect the customer back to the cart page.

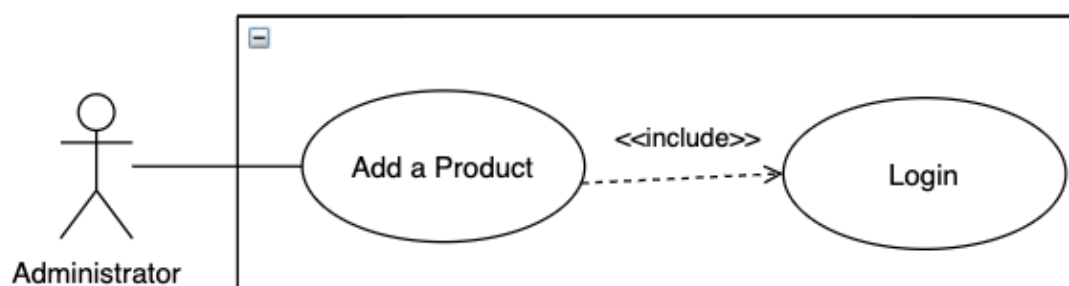### 3.1.8. Requirement 7: Add a Product

Use Case: Add a Product(*fig8*)

fig8: Requirement 6 use-case - Add a Product

Name	Add a Product
Description	An administrator adds a product using the CMS on the application.
Priority	This use-case is of **priority 7** because the system requires the Administrator the functionality to add products.
Precondition	The administrator has an account on the system.
Flow Description	
Activation	This use case is started when administrator selects the Add Product from the CMS page.
Main Flow	1. The system displays the input fields Name, Category, Price, Quantity and Product Image(opens file explorer upload file locally). 2. The administrator inputs all the required fields. 3. The administrator selects the submit button. 4. The system displays the product was added successfully.
Alternate Flow	
Title	Description
Exceptional Flow	
Title	Description
Post-Condition	
Title	Description
Termination	The system displays the product was added successfully.

3.2. Non-Functional Requirements

3.2.1. Performance/Response time requirement

The web application when deployed should handle 100 users at a given time. The following conditions are expected to be satisfied:

• Login shall not take longer than 3 seconds.

• Loading of pages shall not take longer than 5 seconds

3.2.2. Availability requirement

The web application will be deployed to a cloud service before the deadline for final project submission. The selected cloud service will satisfy the performance and response time constraints. The availability for the user of the system requires a computing device that has a browser connected to internet.

3.2.3. Recovery requirement

The system should be able to recover where possible and allow the user to continue to access system functions.

3.2.4. Robustness requirement

The deployed web application should be able to handle errors appropriately. The system should be able to recover where possible and not affect availability.

3.2.5. Security requirement

The deployed web application will not be ready for commercial release when the project is completed. The project is a proof of concept implementation but will follow secure implementations for login and registration. Payment processing will be securely handled by a 3rd party.

3.2.6. Reliability requirement

The cloud service that is chosen to host the web application should be able to satisfy the availability and Performance/Response time requirement.

3.2.7. Maintainability requirement

The web application should be easy to modify and extend the code base in preparation for commercial implementation.

3.2.8. Portability requirement

The web application should be accessible on different device form factors(computer, smart-phone and tablet devices).

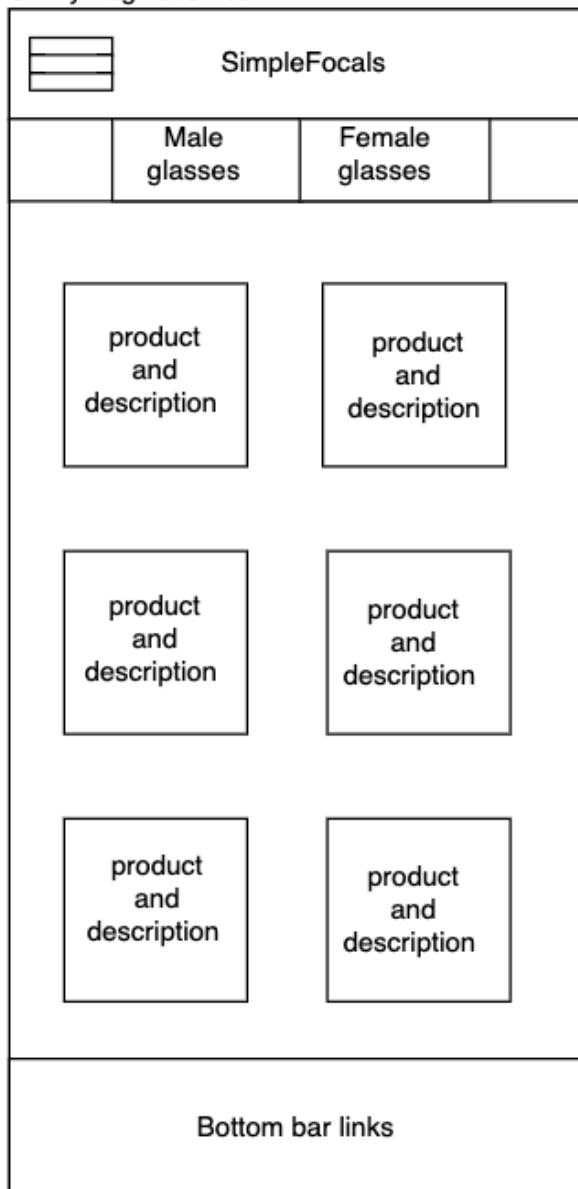### 3.2.9. Extendibility requirement

The web application being developed for this project is a proof of concept implementation. The project should be extendible to a commercially ready application with more development.
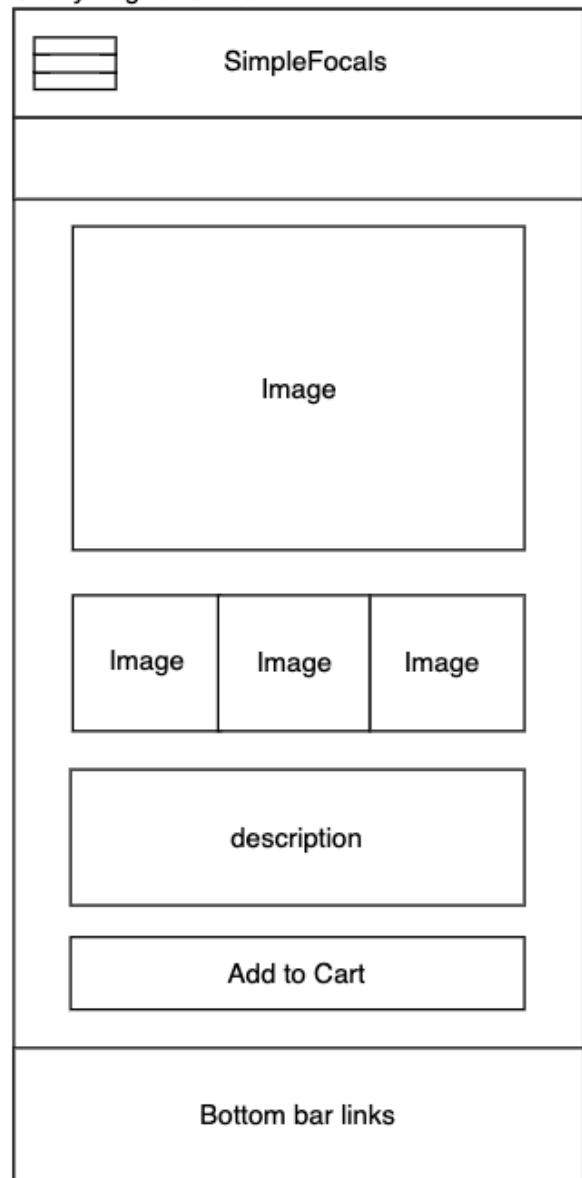
4. Interface requirement

4.1. Graphical User Interface (GUI)

I will take a mobile first design to create the graphical user interface. Prototyping websites on a smaller screen first helps to ensure that user experience is consistent regardless of device. I will illustrate the the GUI using simple wireframes for each function of the system. In the use-case, view product, the interface will look similar to the image below(*fig4.1*). The user will click the products for a more detailed view of the product. The use-case add to cart is activated from the image(*fig4.2*). The registered customer will click the add to cart button. The use-case upload prescription is activated from the image(*fig4.3*). The use-case make a payment is activated from the image(*fig4.4*). The use-case register customer is activated from image(*fig4.5*). The use-case for a customer or administrator to login to the system is activated from image(*fig4.6*). The use-case for an administrator to add a product is activated from the image(*fig4.7*).

Sticky nagivation bar

	SimpleFocals	
	Male glasses	Female glasses

product and description	product and description
product and description	product and description
product and description	product and description

Bottom bar links

fig4.1: Product Page - view product

Sticky nagivation bar

	SimpleFocals

Image

Image	Image	Image

description

Add to Cart

Bottom bar links

fig4.2: Detailed Product Page - add to cart

Sticky nagivation bar

☰	SimpleFocals

Enter prescription for each eye

Right [   ]

Left [   ]

```
file explorer on device
```

Add prescription

```
Submit
```

Bottom bar links


Sticky nagivation bar

☰	SimpleFocals

item 1: details and quantity

item 2: details and quantity

item 3: details and quantity

post and packaging
vat
total cost

```
Pay now
```

Bottom bar links

---

fig4.3: Upload Prescription page - upload prescription

fig4.4: Payment page - make a payment

Sticky nagivation bar

	SimpleFocals

Register an Account

First Name

Last Name

Password

Confirm
Password

Gender

Date of Birth

Adress

Submit

Bottom bar links

*fig4.5: Registration page - register customer*

Sticky nagivation bar

	SimpleFocals

Login or Register

Email

Password

Login

Create an account

Register

Bottom bar links

fig4.6: Login page - log in to system

Sticky nagivation bar

	Admin
SimpleFocals	

Add a Product

Name [   ]

Gender [   ]

Price [   ]

Quantity [   ]

Description [   ]

file explorer on device

upload image

Submit

Bottom bar links

fig4.7: Add product admin page
- add product

4.2. Application Programming Interface (API)

The payment processing will be handled by an external 3rd party service. I am currently researching integrating the Stripe payment API or the Paypal API for use in the web application. In the completion of the project one of these shall be implemented. The use of external payment API means that no sensitive card details are stored within the web application. Those details will be discretely and securely processed by the trusted 3rd party.

5. System Architecture

The class diagram(*fig5.1*) is the initial design structure for the web application. During future revisions this structure is open to change.
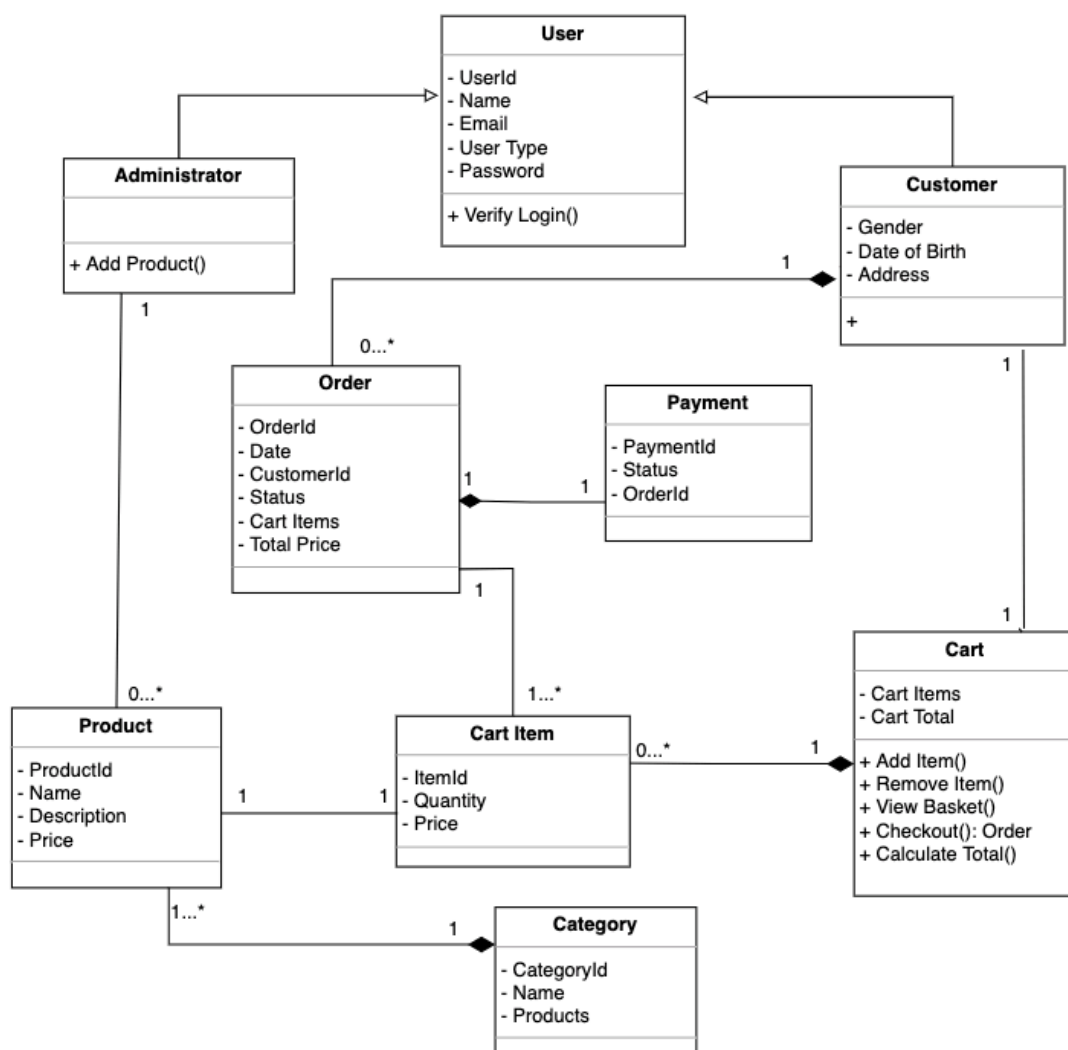

fig5.1: Initial Conceptual Class Diagram for SimpleFocals

6. System Evolution

Future revisions of the web application could bring more features.

1. Adding Customer reviews (star ratings for product and service).

2. Increase functionality on Administrator dashboard (content search, manage reviews)

3. Add subscription model for purchasing eyewear.