

Demo 4: Requirements Specifications



GreenCart

Client: BBD Software

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Introduction

Vision and Mission

GreenCart is a purpose-driven e-commerce platform designed to promote sustainable and ethical consumerism by connecting users with a curated selection of eco-conscious products. As environmental awareness continues to grow, many consumers are actively seeking ways to align their purchasing habits with their values—but finding truly sustainable products and transparent information can be difficult. GreenCart aims to solve that problem.

Business Needs

With rising concern over the environmental impact of consumption, GreenCart addresses the challenge of finding sustainable products by creating a transparent, informative, and user-friendly online marketplace. The platform supports ethical commerce and empowers users to reduce their ecological footprint through informed purchases.




Scope

The platform serves as a centralized marketplace that features products from verified ethical brands, making it easier for users to shop responsibly. It empowers consumers to filter and browse items based on key sustainability metrics, such as carbon footprint, certifications (e.g. organic, Fair Trade, carbon-neutral), and production practices. By offering clear environmental impact insights on each product, users can make informed choices that reflect their personal commitment to sustainability.

Beyond basic shopping functionality, GreenCart integrates carbon tracking tools that allow users to monitor the cumulative footprint of their purchases over time. This feature not only raises awareness but also encourages more mindful decision-making. Additionally, the platform can offer users options to offset their carbon impact, creating a closed loop of accountability and positive action.

GreenCart isn't just an online store—it's a digital ecosystem that supports a community of conscious consumers. With potential features such as reviews, discussions, and personalized recommendations, the platform aims to foster



a culture of transparency, environmental responsibility, and smarter shopping. Whether a user is new to sustainability or already deeply invested, GreenCart meets them where they are and helps them take the next step toward ethical living.

User characteristics and user stories

1. **Guest website user**
2. **Retailer (Authenticated website user)**
3. **Eco-Conscious shopper (Authenticated website user)**
4. **System Administrator**

Guest website users


are non-registered actors who can explore the platform and access publicly available content. They can browse and search for products, view featured items, and learn about the platform's sustainability principles. However, they cannot make purchases or access personalized features such as detailed carbon footprint tracking or user-specific recommendations.

Retailer (Authenticated website user)

are registered actors that list and manage their products on the platform. They provide sustainability data for their products, view sales analytics, and engage with customers through reviews and transparency features.

Eco-Conscious shopper (Authenticated website user)

A registered user focused on sustainable and ethical shopping. They can browse, purchase products, track their environmental impact, filter by eco-certifications, and engage with platform features like reviews and recommendations.



System Administrator

System administrators are internal actors responsible for maintaining the platform's integrity, security, and performance. They manage user accounts, moderate content, oversee platform analytics, and ensure that data privacy and sustainability metrics remain accurate and up to date. Their role is critical to supporting system functionality, responding to issues, and maintaining quality standards across the platform.

They are also responsible for maintaining integrity of the platform and approving user applications towards becoming a retailer user on the platform. This is to ensure that only legitimate sellers are permitted to sell on the platform.

Guest Website User


1. Account Prompting & Engagement:

- a. As a guest user, I want to be prompted to register when I try to make a purchase so that I understand the benefits of signing up.

2. Product Discovery & Browsing:

- a. As a guest user, I want to browse and search for products so that I can explore what the platform offers without registering.
- b. As a guest user, I want to use advanced search functionality with multiple filters so that I can find specific types of eco-friendly products quickly.
- c. As a guest user, I want to sort products by price, sustainability rating, or popularity so that I can browse products in my preferred order.
- d. As a guest user, I want to view product sustainability ratings and badges so that I can quickly identify the most eco-friendly options.
- e. As a guest user, I want to see product images and basic details so that I can evaluate products visually before deciding to register.
- f. As a guest user, I want to learn about the platform's sustainability principles so that I understand the values behind the marketplace.
- g. As a guest user, I want to view featured eco-friendly products so that I can quickly see what's trending or recommended.

3. User Interface & Experience:

- a. As a guest user, I want to access the platform on mobile devices with a responsive interface so that I can browse products on the go.
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- b. As a guest user, I want to see loading indicators and error messages so that I understand the system status while browsing.
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Retailer (Authenticated Website User)

1. Product & Profile Management:

- a. As a retailer, I want to register and create a seller profile so that I can list my sustainable products on the platform.
 - b. As a retailer, I want to upload and manage product listings with relevant sustainability information so that shoppers can make informed purchases.
 - c. As a retailer, I want to tag products with certifications (e.g., Fair Trade, Organic) so that my products appear in filtered searches.
 - d. As a retailer, I want to access a dashboard showing my product performance and sales so that I can make better business decisions.
 - e. As a retailer, I want to view analytics on the environmental impact of my product sales so that I can showcase my brand's sustainability efforts.
 - f. As a retailer, I want to respond to customer reviews so that I can build trust and engage with my audience.
 - g. As a retailer, I want to update or deactivate products when needed so that my listings remain accurate and current.
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Eco-Conscious Shopper (Authenticated Website User)

1. Product Discovery & Purchase:

- a. As an eco-conscious shopper, I want to browse the shop interface and view multiple products sold.
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- b. As an eco-conscious shopper, I want to purchase sustainable products so that I can support environmentally responsible businesses.
 - c. As an eco-conscious shopper, I want to filter products by eco-certifications (e.g., organic, carbon-neutral) so that I can easily find items that meet my values.
 - d. As an eco-conscious shopper, I want to view detailed sustainability metrics (e.g., carbon footprint, sourcing) for each product so that I can make informed decisions.

2. Personalization & Recommendations:

- a. As an eco-conscious shopper, I want to receive personalized product recommendations based on my sustainability preferences so that I can shop more efficiently.
- b. As an eco-conscious shopper, I want to leave reviews and contribute tips on products so that I can help others in the community.
- c. As an eco-conscious shopper, I want the option to offset my carbon footprint at checkout so that I can further reduce my impact.

3. Account & Profile Management

- a. As an eco-conscious shopper, I want to create and manage my user profile with personal information so that I can have a personalized shopping experience.
- b. As an eco-conscious shopper, I want to update my contact information and addresses so that my deliveries reach the correct location.
- c. As an eco-conscious shopper, I want to change my password and enable two-factor authentication so that my account remains secure.
- d. As an eco-conscious shopper, I want to manage my notification preferences so that I receive only relevant communications.
- e. As an eco-conscious shopper, I want to view my login history so that I can monitor account security.


4. Shopping Cart & Orders:

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- a. As an eco-conscious shopper, I want to add products to my shopping cart so that I can purchase multiple items together.
 - b. As an eco-conscious shopper, I want to view and modify my cart contents so that I can adjust quantities or remove items before checkout.
 - c. As an eco-conscious shopper, I want to place orders and track their status so that I know when to expect my deliveries.
 - d. As an eco-conscious shopper, I want to view my order history so that I can track my purchasing patterns and reorder favorite items.
 - e. As an eco-conscious shopper, I want to cancel orders when necessary so that I can change my mind before shipment.

5. Carbon Footprint & Sustainability Tracking:

- a. As an eco-conscious shopper, I want to view my monthly and yearly carbon footprint trends so that I can track my environmental impact over time.
- b. As an eco-conscious shopper, I want to see my carbon footprint broken down by product categories so that I can identify areas for improvement.
- c. As an eco-conscious shopper, I want to set and monitor carbon reduction goals so that I can work towards more sustainable shopping habits.
- d. As an eco-conscious shopper, I want to view the carbon impact of individual orders so that I can make informed purchasing decisions.
- e. As an eco-conscious shopper, I want to earn sustainability achievements so that I feel motivated to continue eco-friendly shopping.
- f. As an eco-conscious shopper, I want to receive personalized recommendations for reducing my environmental impact so that I can improve my sustainability practices.

6. Product Information & Reviews:

- a. As an eco-conscious shopper, I want to view detailed product information including sustainability metrics so that I can make informed purchasing decisions.
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- b.** As an eco-conscious shopper, I want to see product sustainability ratings with detailed breakdowns (energy efficiency, carbon footprint, recyclability) so that I understand exactly how eco-friendly each product is.
 - c.** As an eco-conscious shopper, I want to view product images and descriptions so that I know exactly what I'm purchasing.

7. Help & Support:

- a.** As an eco-conscious shopper, I want to access a help center with FAQs and guides so that I can resolve issues independently.
 - b.** As an eco-conscious shopper, I want to search for help topics so that I can quickly find answers to specific questions.
-

System Administrator

1. User Management:

- a.** As a system administrator, I want to view and manage user accounts so that I can provide support and maintain platform security.
- b.** As a system administrator, I want to access user login history and activity logs so that I can monitor for suspicious activity.
- c.** As a system administrator, I want to backup user data regularly so that customer information is protected.

2. Product & Content Management:

- a.** As a system administrator, I want to moderate product listings and reviews so that the platform maintains quality standards.
 - b.** As a system administrator, I want to manage sustainability rating criteria so that the scoring system remains accurate and relevant.
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Functional Requirements

R1: Onboarding & Authentication Subsystem

R1.1: The system needs to allow new users to register with an email password.

R1.2: The system needs to allow users to authenticate via third party providers (e.g. google).


R1.3: The system needs to verify a users email address during registration.

R1.4: The system needs to allow users to log in and log out.

R1.5: The system needs to manage session tokens using JWT securely.

R1.6: The system needs to provide 2-factor authentication.

R1.7: The system needs to provide password reset and recovery via email.



R2: User & Retailer Profile Management Subsystem

R2.1: The system needs allow user to update their personal information (name ,address, profile image)

R2.2: The system needs to allow to view their order history and environmental impact

R2.3: The system needs to allow retailers to update their business profile.

R2.4: The system needs to allow retailers to view view transaction and product sales analytics data.

R2.5: The system needs to allow users and retailers to manage privacy and notification preferences

R3: Product management subsystem


R3.1: The system needs to add new product listings with details and media.

R3.2: The system needs to allow retailers to add or update existing product information.

R3.3: The system needs to allow retailers to remove products from their catalog.

R3.4: The system needs to allow retailers to tag products with sustainability metadata (e.g. certifications, origin)

R3.4: The system needs to provide product performance analytics to the retailer (e.g. views, purchases).



R4: Product Browsing & Discovery Subsystem

R4.1: The system allows all users (registered or unregistered) to browse all available products

R4.2: The system will need to provide filtering options by category, price, certification, carbon rating, and availability.

R4.3: The system needs provide text-based search functionality across product names and tags.

R4.4: The system needs to display detailed product pages with price, description, image and sustainability data.

R4.5: the system allows the user to sort by popularity, price, and environmental impact.

R5: Shopping cart and order processing Subsystem

R5.1: The system allows for users to add products to their cart

R5.2: The system needs to allow users to remove specified quantities of products in the cart

R5.3: The system needs to provide an interface for users to track and monitor their order

R5.4: The system needs to store the order history of the user



R6: Sustainability insights subsystem

R6.1: The system needs to track carbon footprint per product based on provided data.

R6.2: The system will calculate and track a users carbon footprint over a period of time

R6.3: The system will generate weekly, monthly and yearly sustainability reports.

R6.4: The system will compare a user's footprint with the average across the platform.

R6.5: The system will provide visualization of the users footprint trends (e.g., graphs, badges).

R6.6: The system will generate


R7: Eco-friendly recommendations subsystem

R7.1: The system will suggest lower carbon footprint alternatives to what's in the user's cart

R7.2: The system will provide eco friendly promotions, sales and bundles to the user.

R7.3: The system needs to provide sustainability tips to the user based on their carbon footprint and purchasing history.

R7.4: The system will adapt its recommendations dynamically based on user preferences and previous purchases made.



R8: Donation & Carbon Offset Subsystem


R8.1: The system needs to offer users the option to donate during checkout to offset emissions.

R8.2: The system needs to allow users to view and track their offset contributions.

R8.3: The system needs to display the carbon offset impact in the user's sustainability profile.

R8.4: The system needs to allow retailers to contribute a percentage of sales toward carbon offsetting.

R8.5: The system needs to issue digital badges to users based on offset milestones.

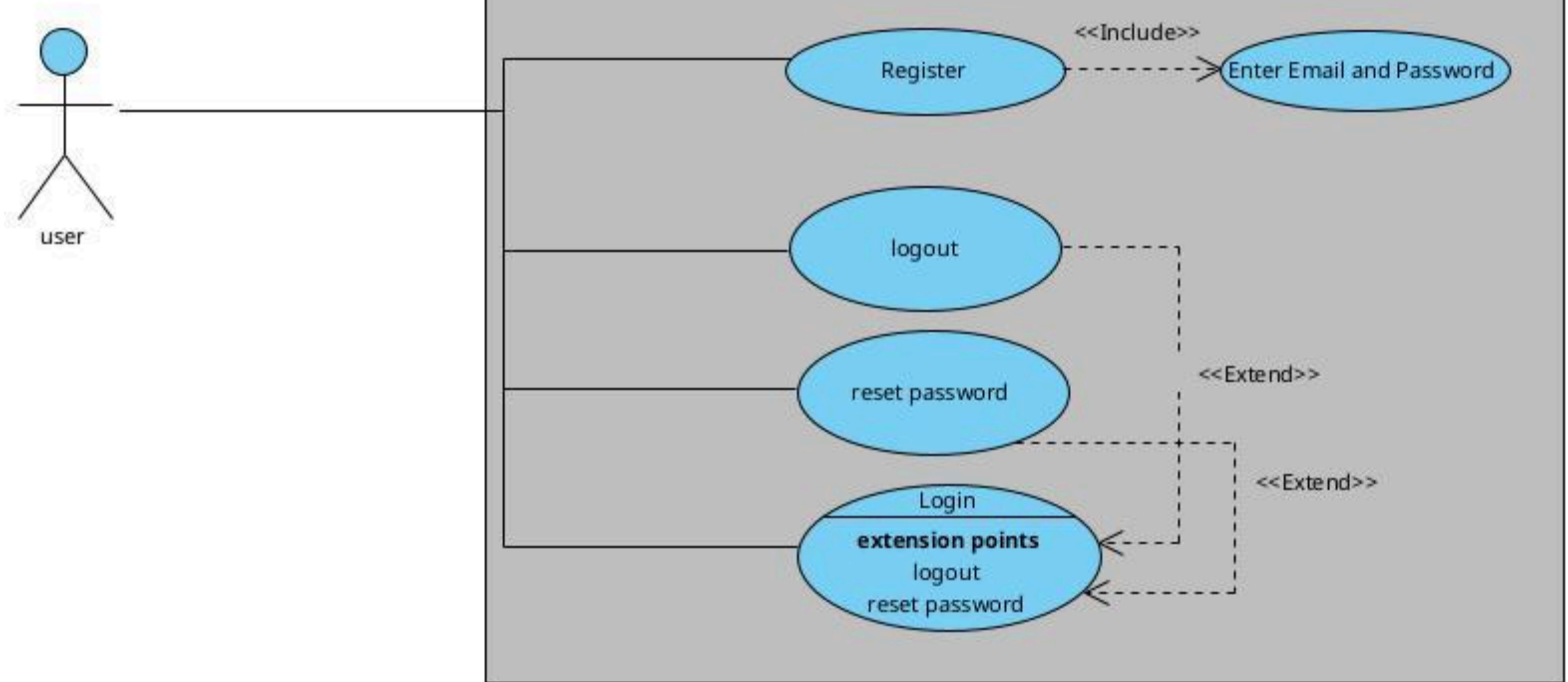


Use cases

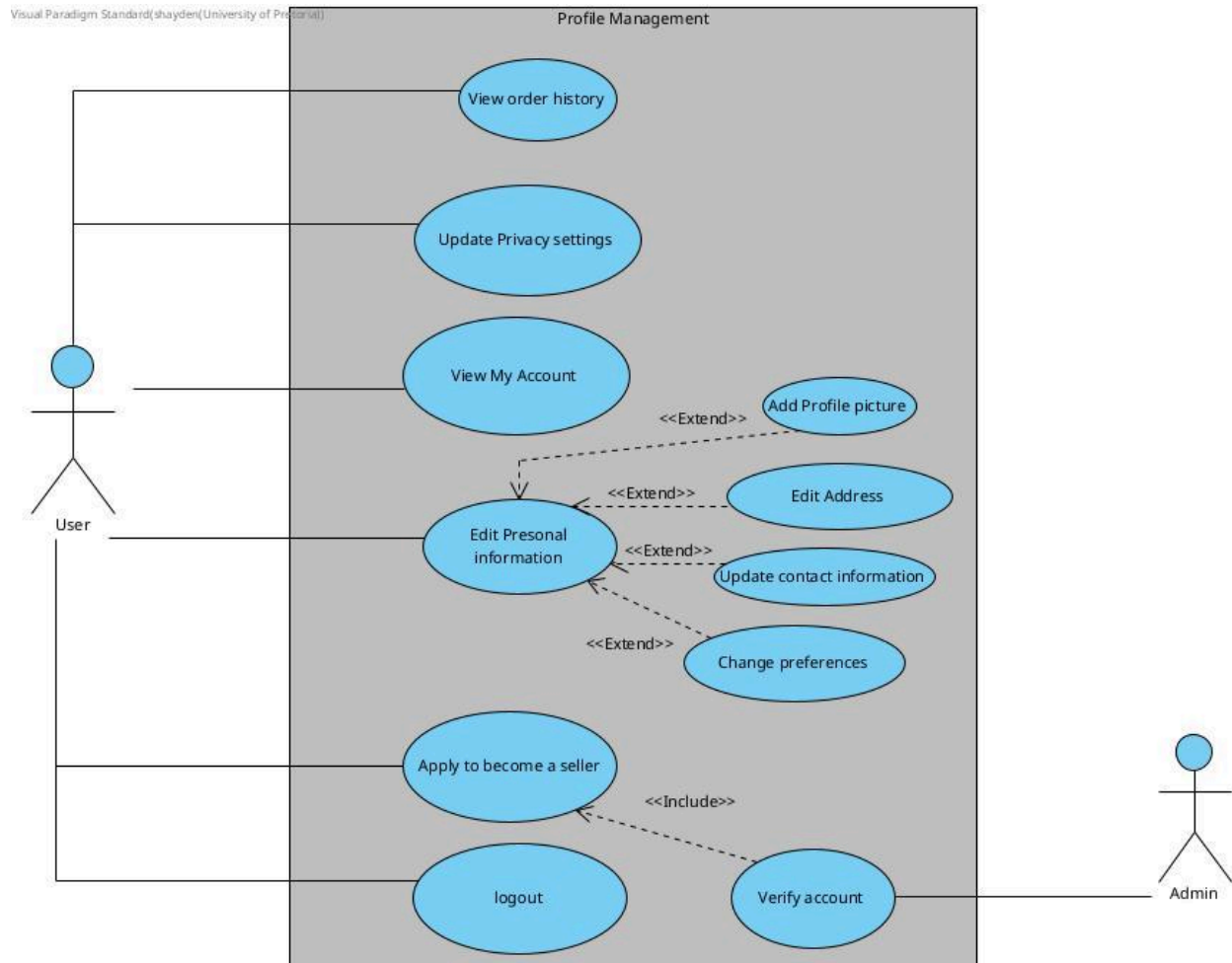
- 1. Onboarding & Authentication Subsystem**
 - 2. User and Retailer Profile management**
 - 3. Product Management Subsystem**
 - 4. Product Browsing & Discovery Subsystem**
 - 5. Shopping Cart & Order Processing Subsystem**
 - 6. Sustainability Insights Subsystem**
 - 7. Eco-Friendly Recommendation Subsystem**
 - 8. Donation & Carbon Offset Subsystem**
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Onboarding & Authentication Subsystem

Visual Paradigm Standard(shayden(University of Pretoria))

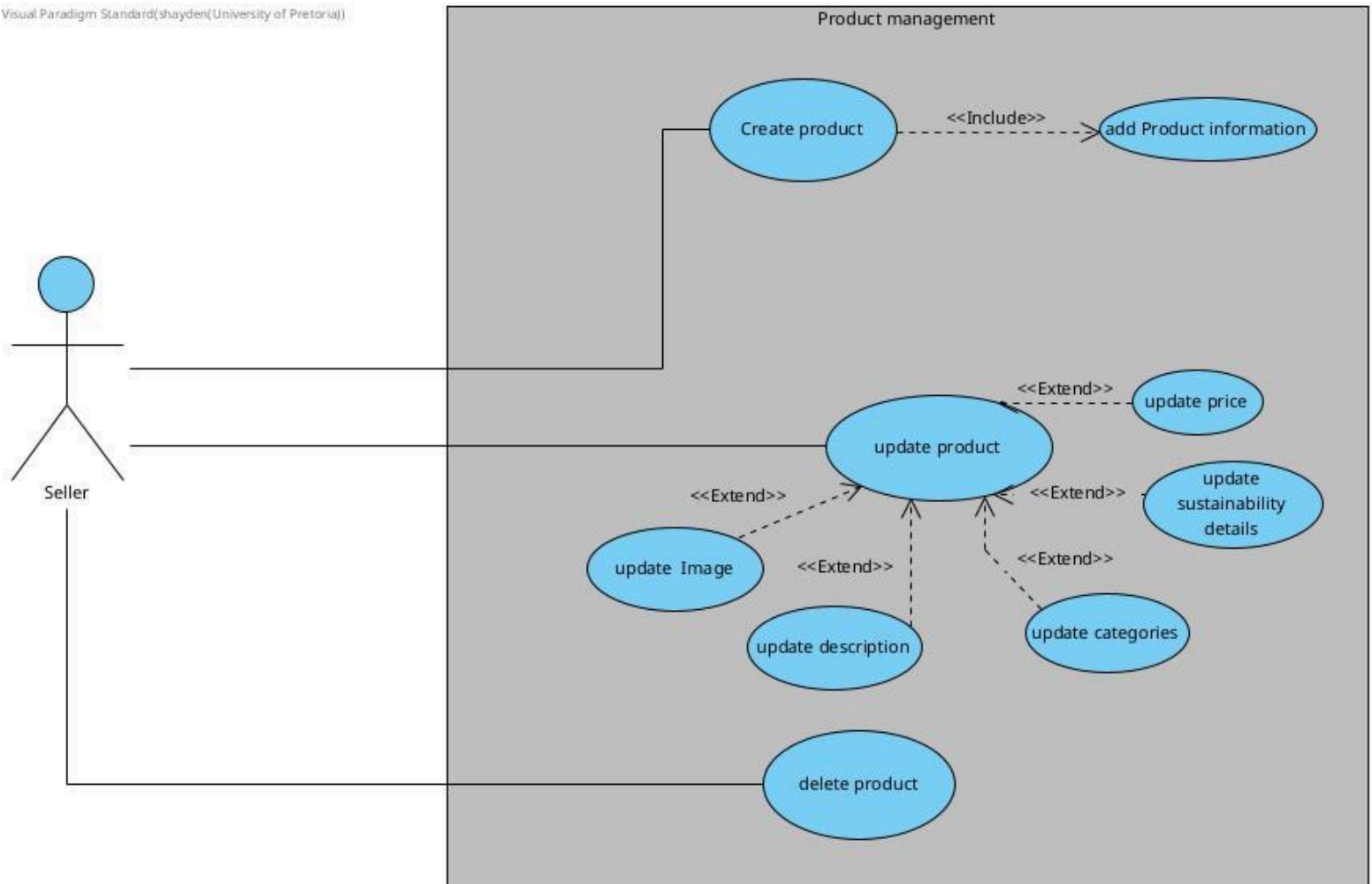


Product Management Subsystem



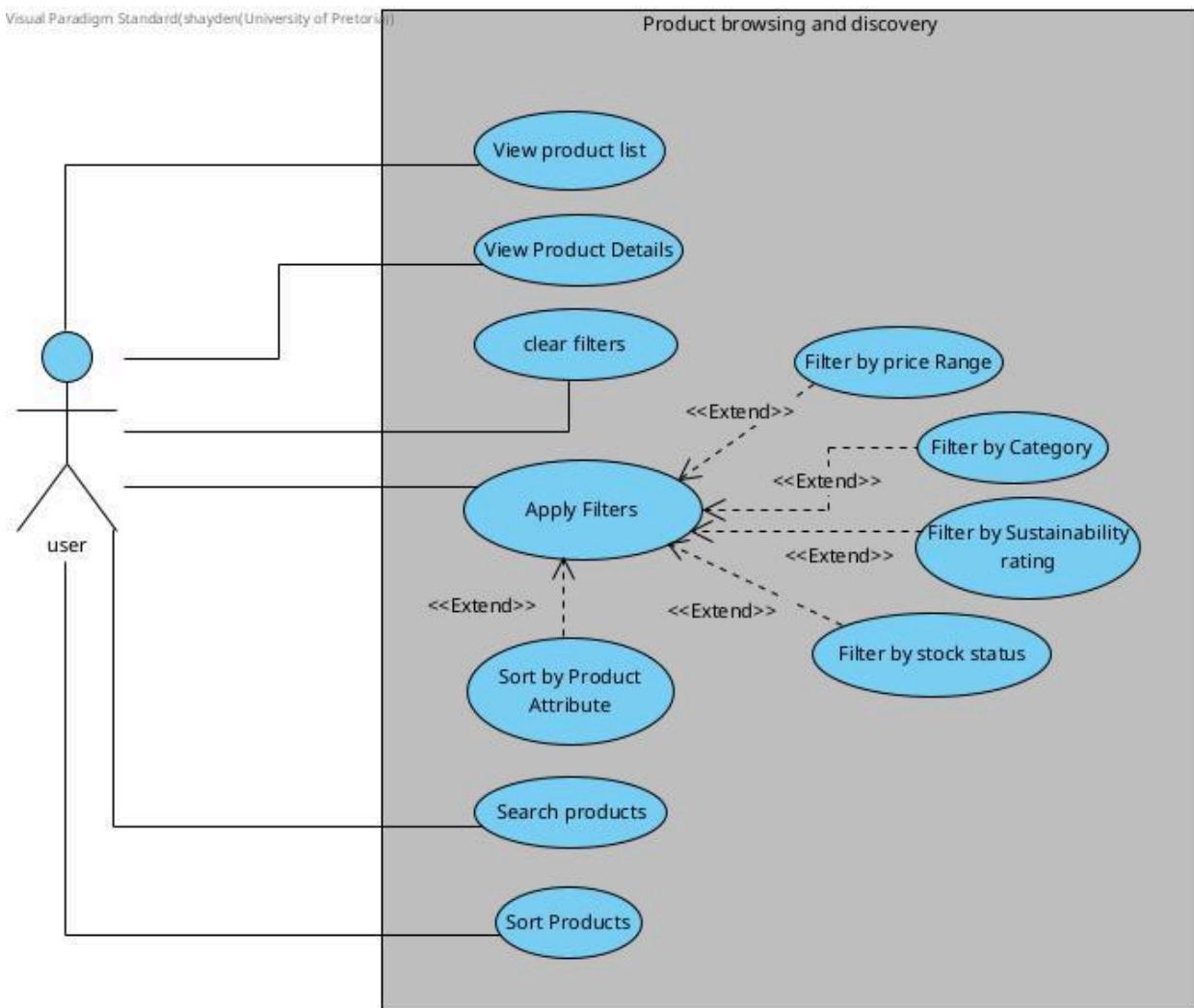
Product Management Subsystem

Visual Paradigm Standard(shayden(University of Pretoria))

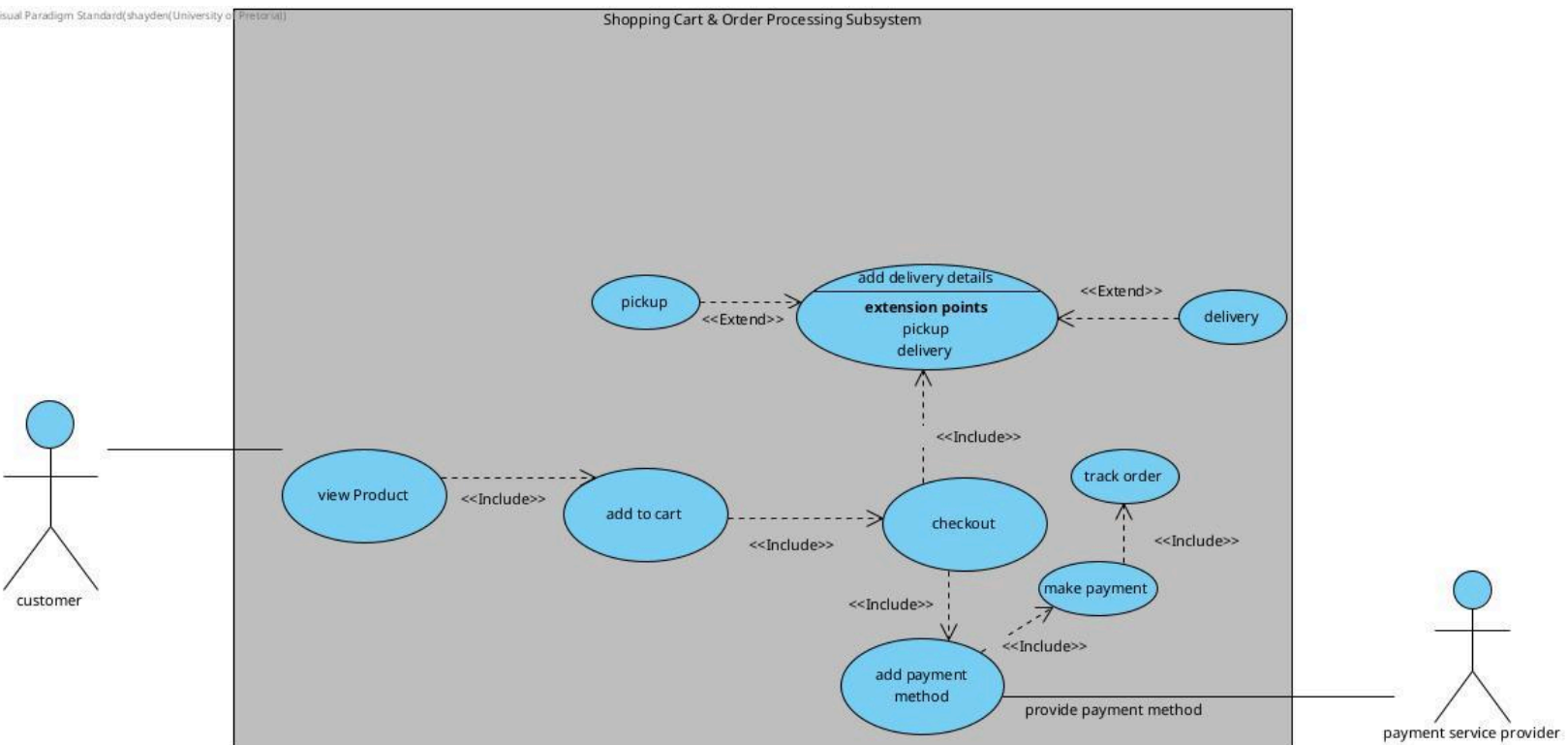


Product Browsing & Discovery Subsystem

Visual Paradigm Standard(shayden(University of Pretoria))

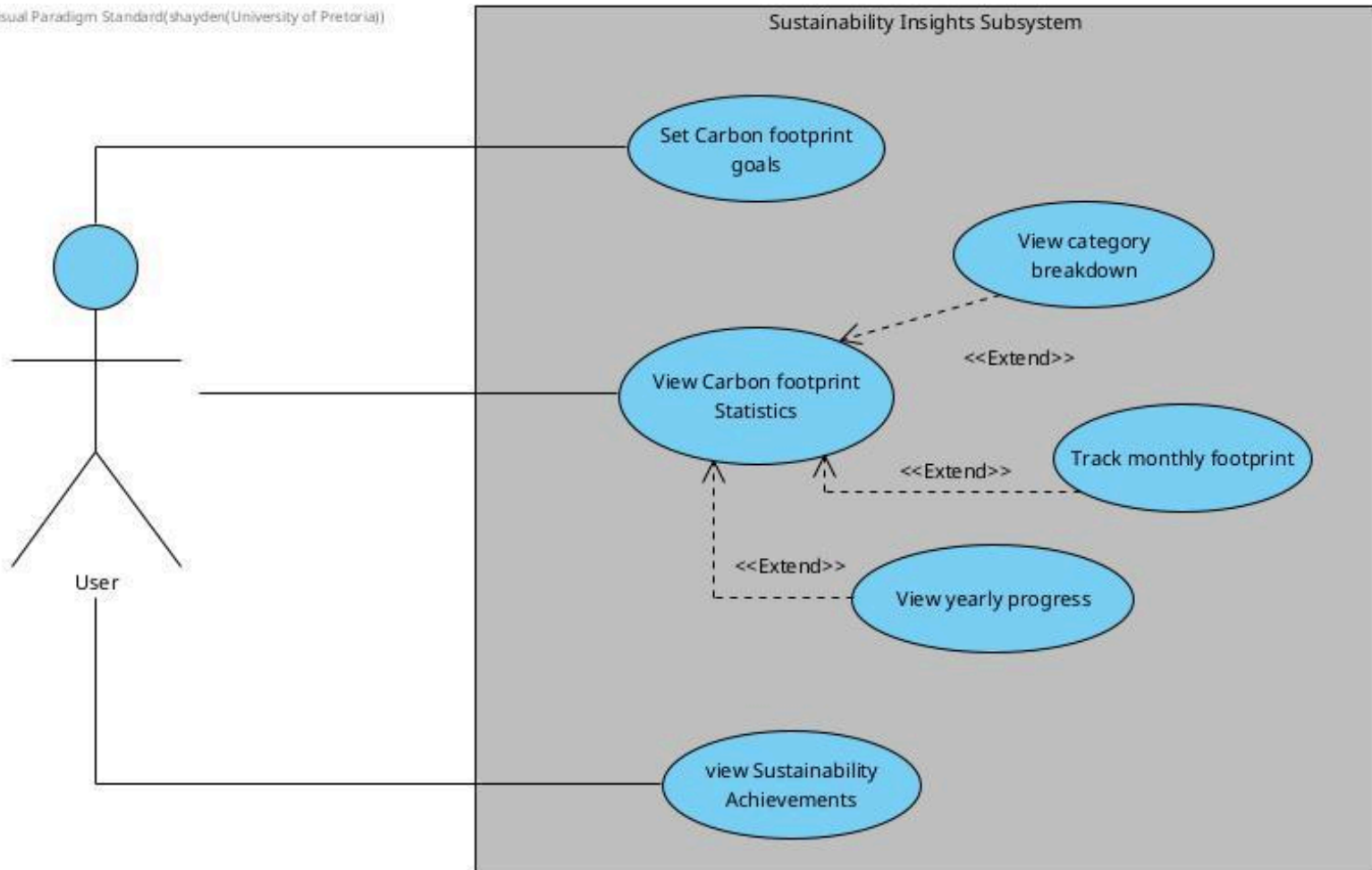


Shopping Cart & Order Processing Subsystem



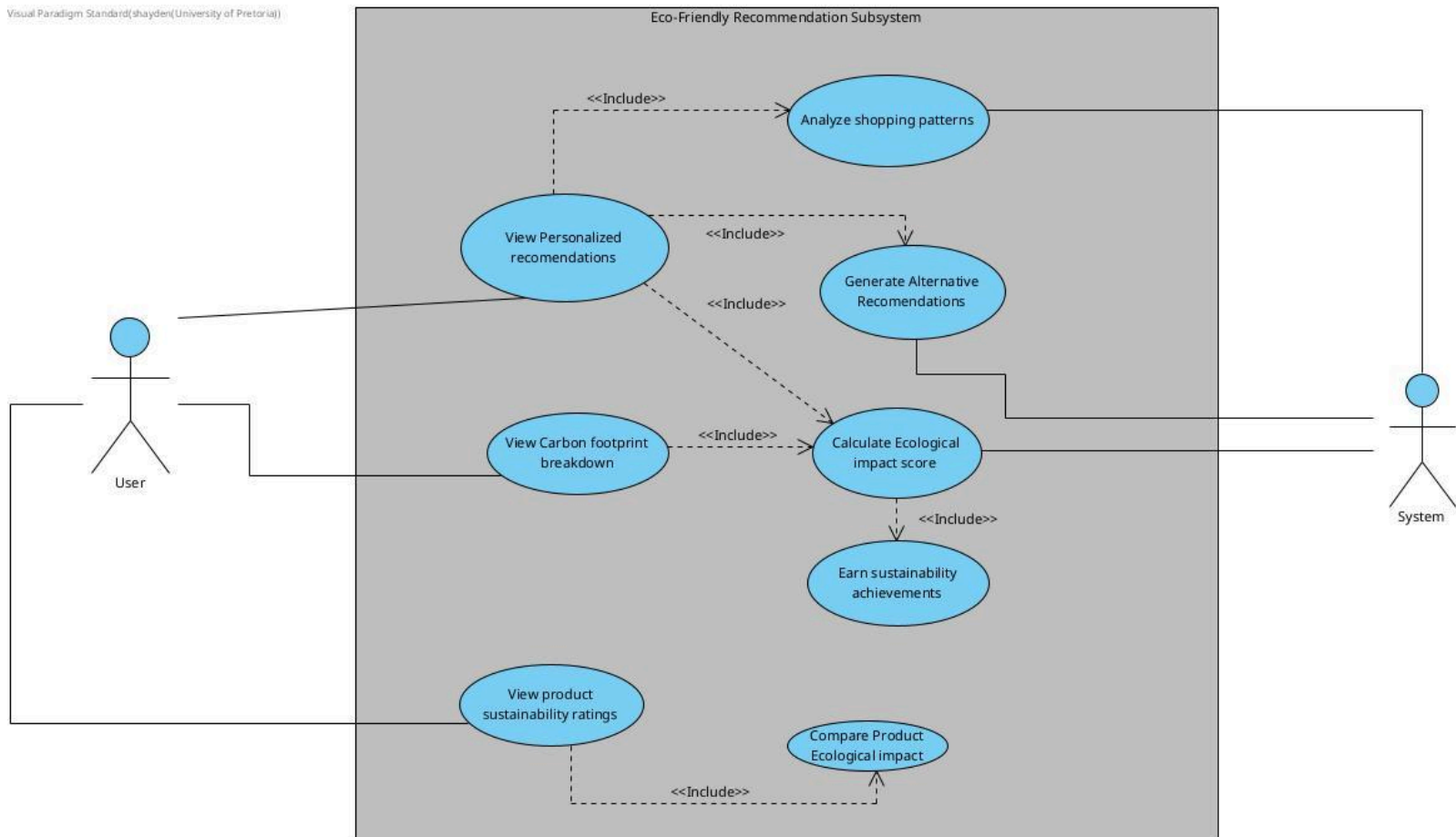
Sustainability Insights Subsystem

Visual Paradigm Standard(shayden(University of Pretoria))

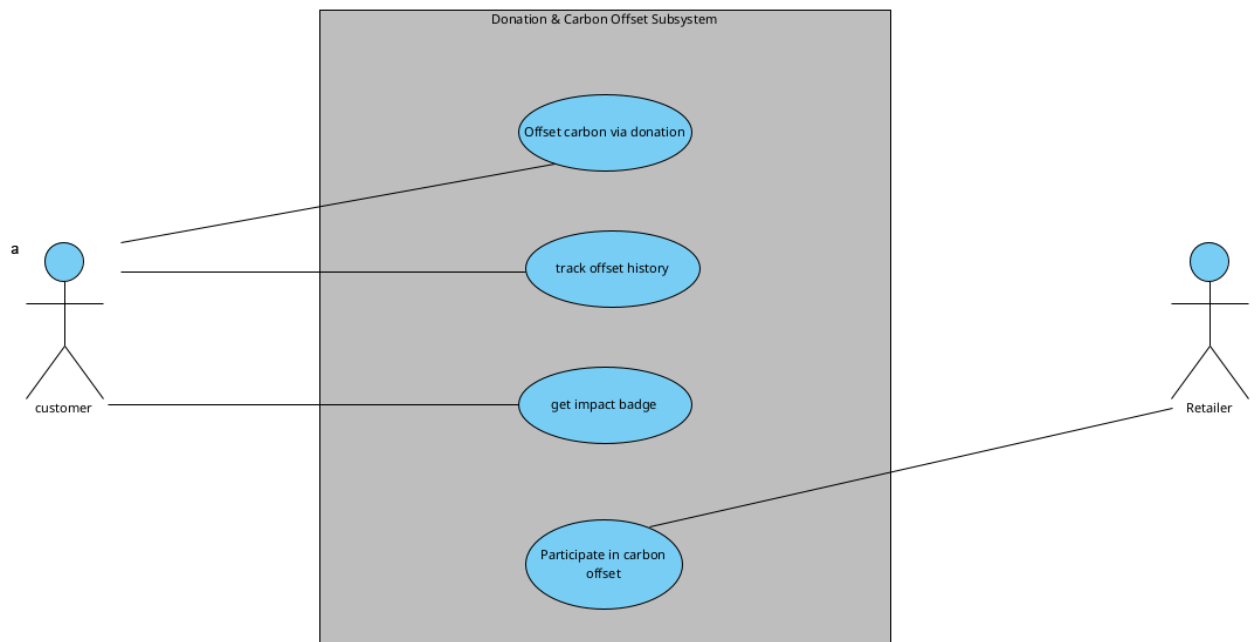


Eco-Friendly Recommendation Subsystem

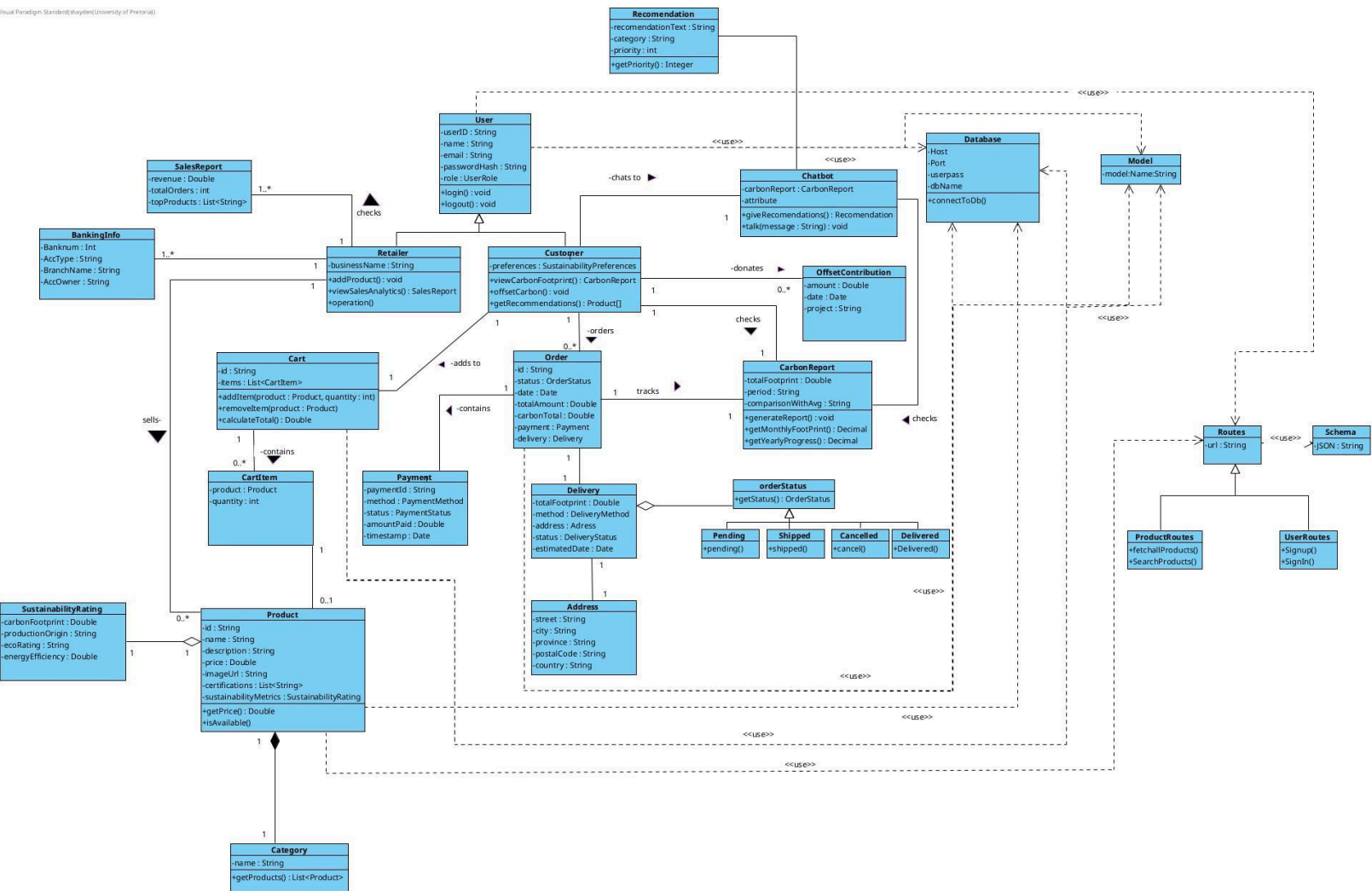
Visual Paradigm Standard(shayden(University of Pretoria))

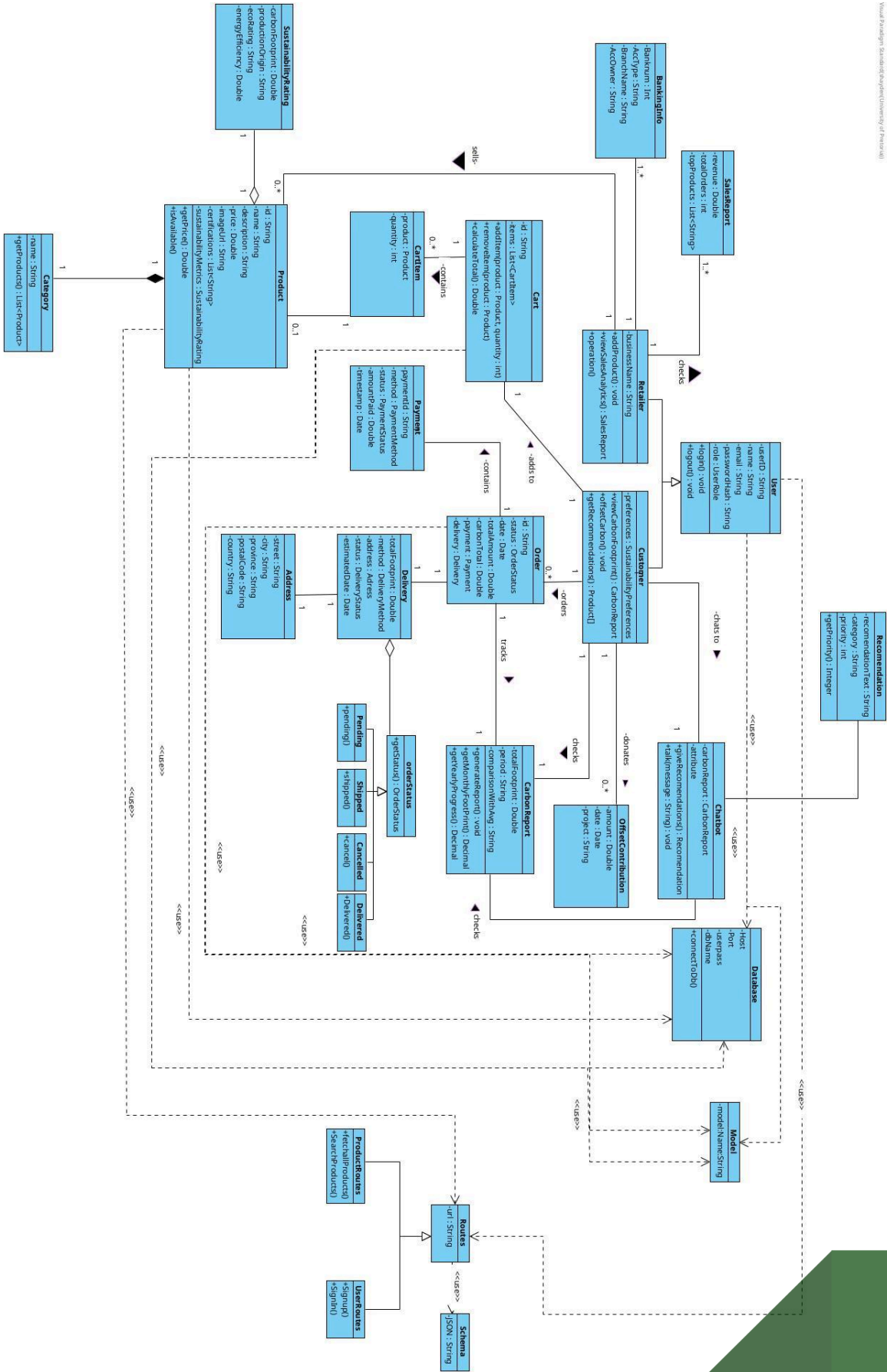


Donation & Carbon Offset Subsystem



Visual Paradigm Standard(shayden(University of Pretoria))





Traceability Matrix

Requirement	Priority Weight	UC 1	UC 2	UC 3	UC 4	UC 5	UC 6
R1:Onboarding & Authentication	3	X					
R1.1	3	X					
R1.2	3	X					
R1.3	3	X					
R1.4	3	X					
R1.5	3	X					
R1.6	3	X					
R1.7	3	X					
R2:User & Retailer Profile Management	2						X
R2.1	2						X

R2.2	2						X
R2.3	2						X
R2.4	2						X
R2.5	2						X
R3:Product Management	2		X				
R3.1	2		X				
R3.2	2		X				
R3.3	2		X				
R3.4	2		X				
R3.5	2		X				
R4:Product Browsing & Discovery	1		X		X		
R4.1	3		X				

R4.2	3		X				
R4.3	3				X		
R4.4	3		X				
R4.5	3		X				
R5:Shopping Cart & Order Processing	3					X	
R5.1	3					X	
R5.2	3					X	
R5.3	3					X	
R5.4	3					X	
R6: Sustainability Insights	1						X
R6.1	1						X
R6.2	1						X

R6.3	1						X
R6.4	1						X
R6.5	1						X
R6.6	1						X
R7:Eco-Friendly Recommendations	2			X			
R7.1	2			X			
R7.2	2			X			
R7.3	2			X			
R7.4	2			X			
R8:Donations & Carbon Offsets	2						X
R8.1	2						X
R8.2	2						X

R8.3	2						X
R8.4	2						X
R8.5	2						X
Total Score (by UC)		7	9	8	1	5	17

Use Case	Description
UC1	User registration, login/logout, 2FA, password reset
UC2	Retailer product management: add, edit, delete, tag with sustainability
UC3	Eco-recommendation system for alternatives and tips
UC4	Product search functionality
UC5	Shopping cart, checkout, and order history
UC6	Sustainability reports, donation tracking, user profile updates