Demo 1: 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)

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 lists and manages 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.

User Stories

Guest website user

1. As a guest user, I want to browse and search for products so that I can explore what the platform offers without registering.
2. As a guest user, I want to view featured eco-friendly products so that I can quickly see what's trending or recommended.
3. As a guest user, I want to learn about the platform's sustainability principles so that I understand the values behind the marketplace.
4. As a guest user, I want to view basic product sustainability information so that I can assess their eco-friendliness before registering.
5. 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.

Retailer (Authenticated website user)

1. As a retailer, I want to register and create a seller profile so that I can list my sustainable products on the platform.
2. As a retailer, I want to upload and manage product listings with relevant sustainability information so that shoppers can make informed purchases.
3. As a retailer, I want to tag products with certifications (e.g., Fair Trade, Organic) so that my products appear in filtered searches.
4. As a retailer, I want to access a dashboard showing my product performance and sales so that I can make better business decisions.
5. 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.
6. As a retailer, I want to respond to customer reviews so that I can build trust and engage with my audience.
7. As a retailer, I want to update or deactivate products when needed so that my listings remain accurate and current.

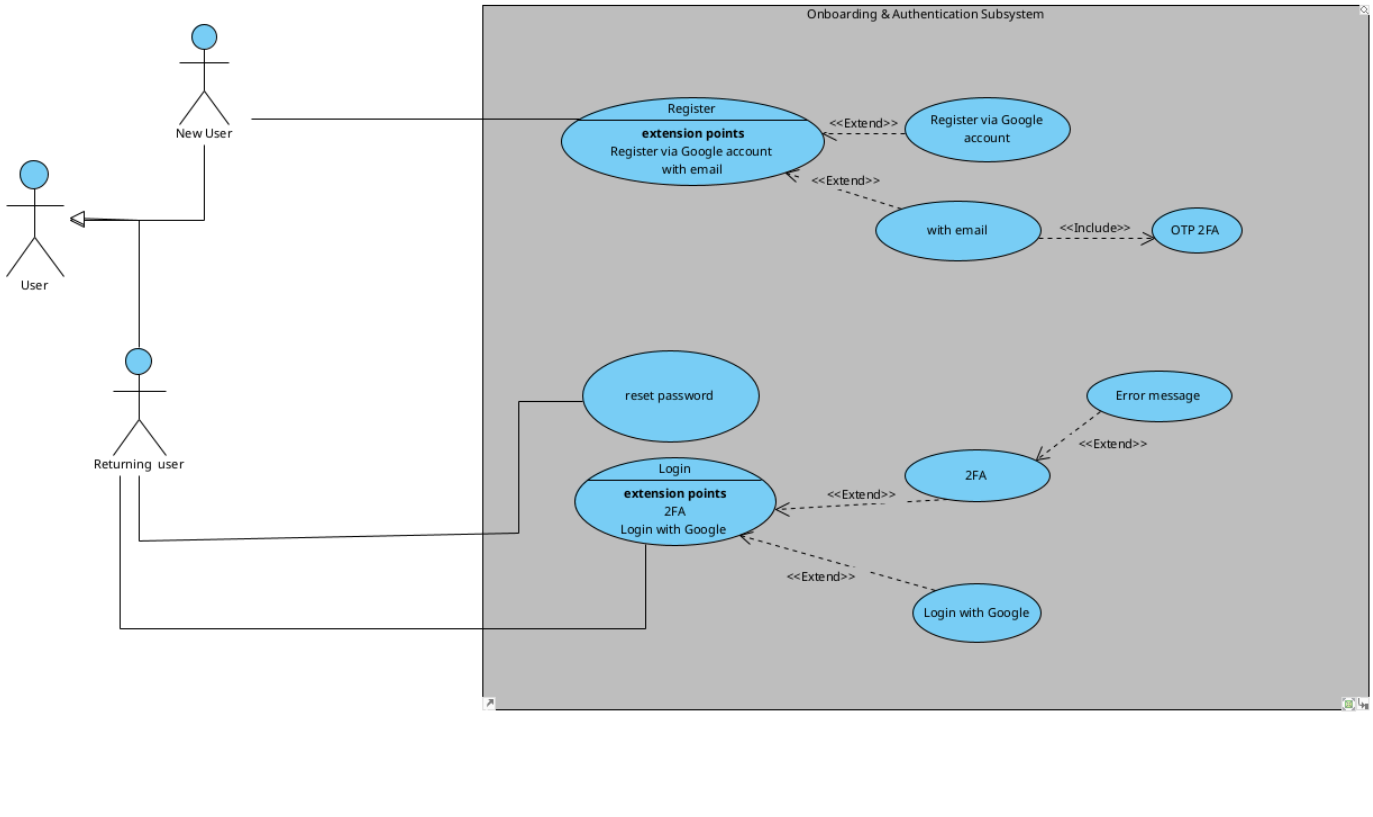
Eco-Conscious shopper (Authenticated website user)

1. As an eco-conscious shopper, I want to be able to browse the shop interface and view multiple products sold.
2. As an eco-conscious shopper, I want to purchase sustainable products so that I can support environmentally responsible businesses.
3. 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.
4. 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.
5. As an eco-conscious shopper, I want to track my total carbon footprint from purchases so that I can monitor and reduce my environmental impact.
6. As an eco-conscious shopper, I want to receive personalized product recommendations based on my sustainability preferences so that I can shop more efficiently.
7. As an eco-conscious shopper, I want to leave reviews and contribute tips on products so that I can help others in the community.
8. As an eco-conscious shopper, I want the option to offset my carbon footprint at checkout so that I can further reduce my impact.

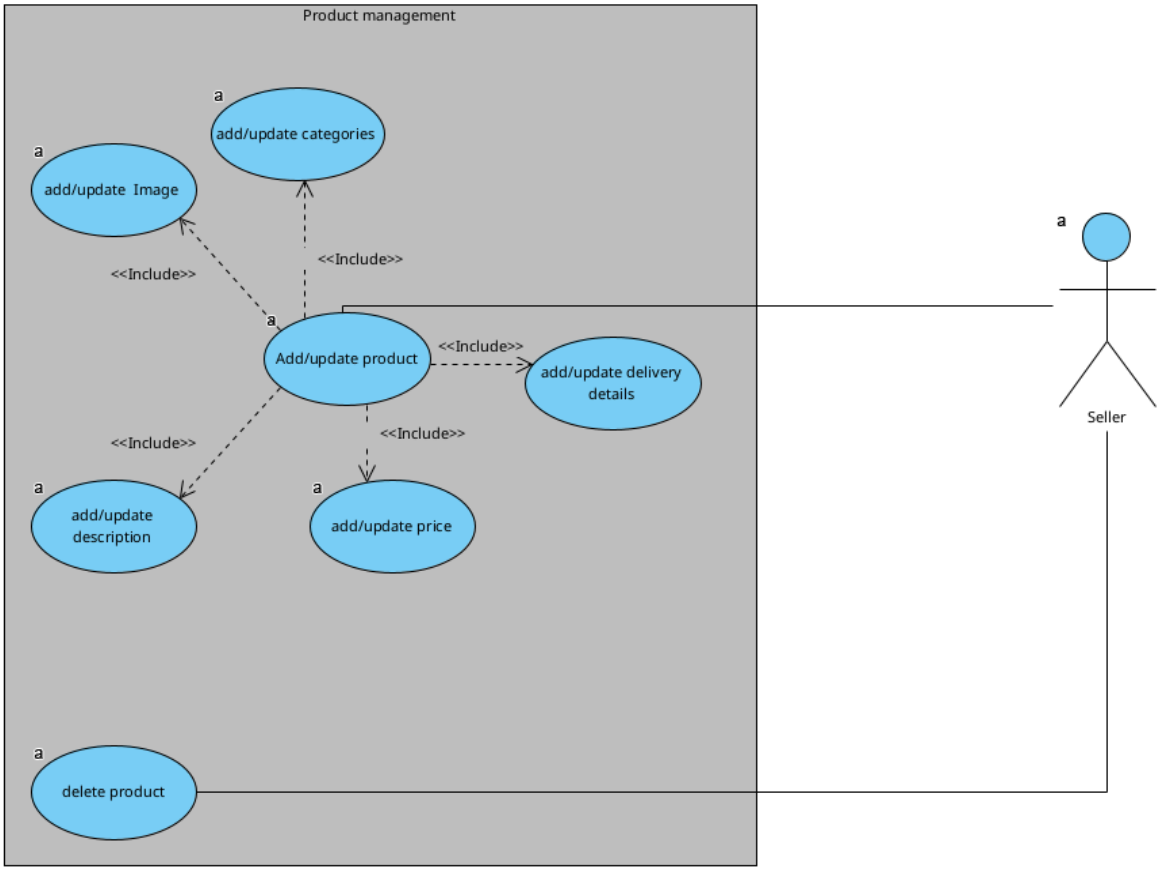
Use cases

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

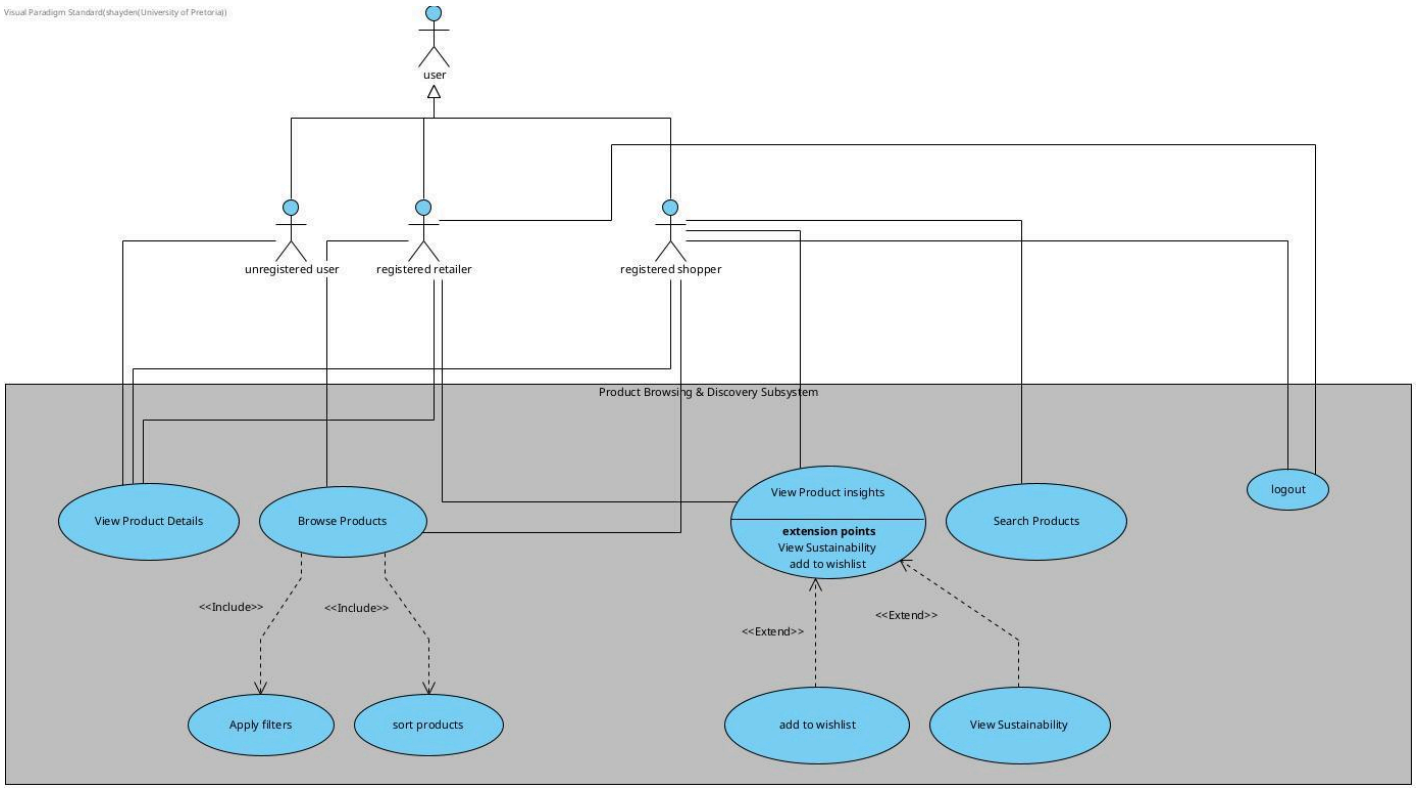
Onboarding & Authentication Subsystem



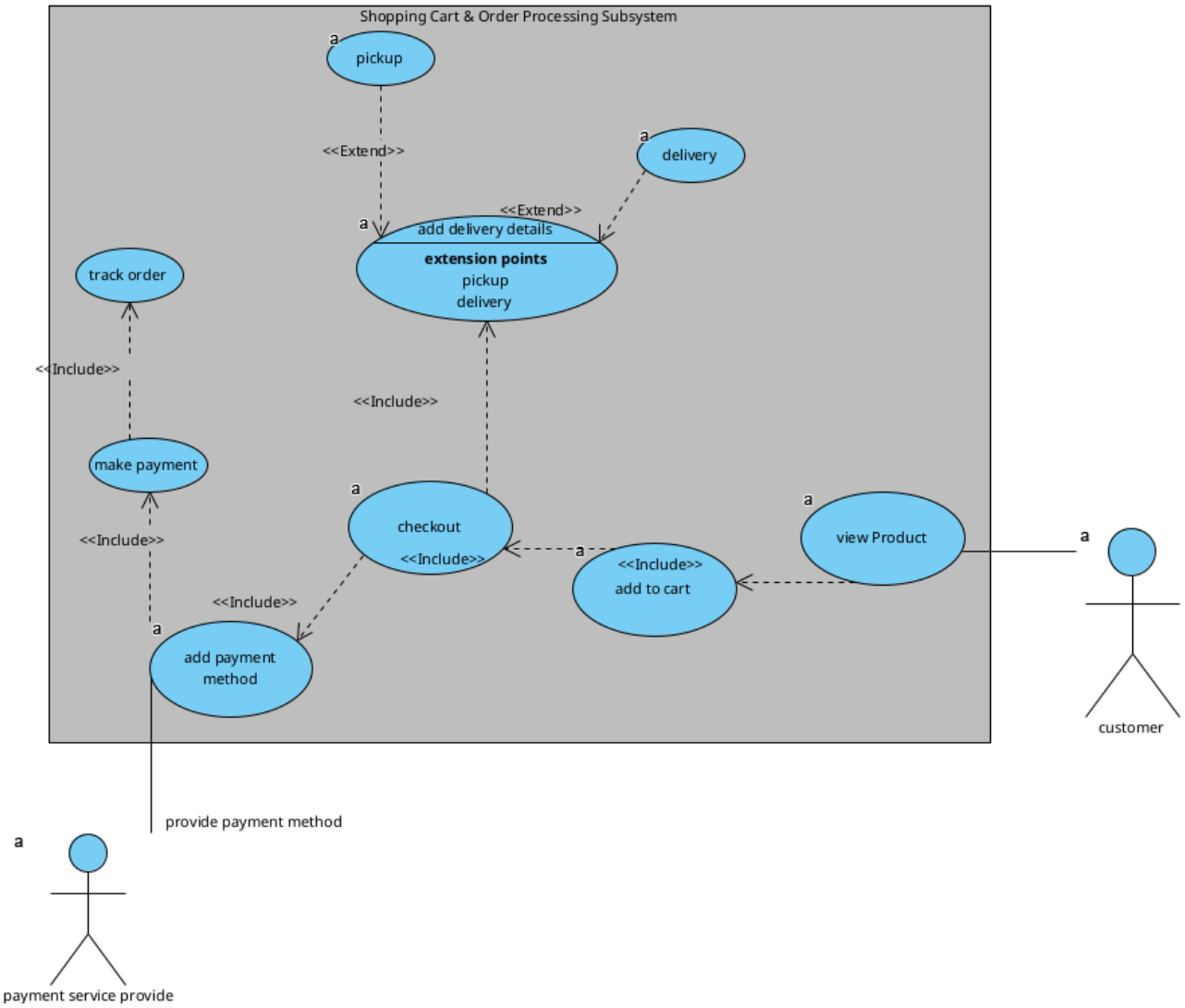
Product Management Subsystem



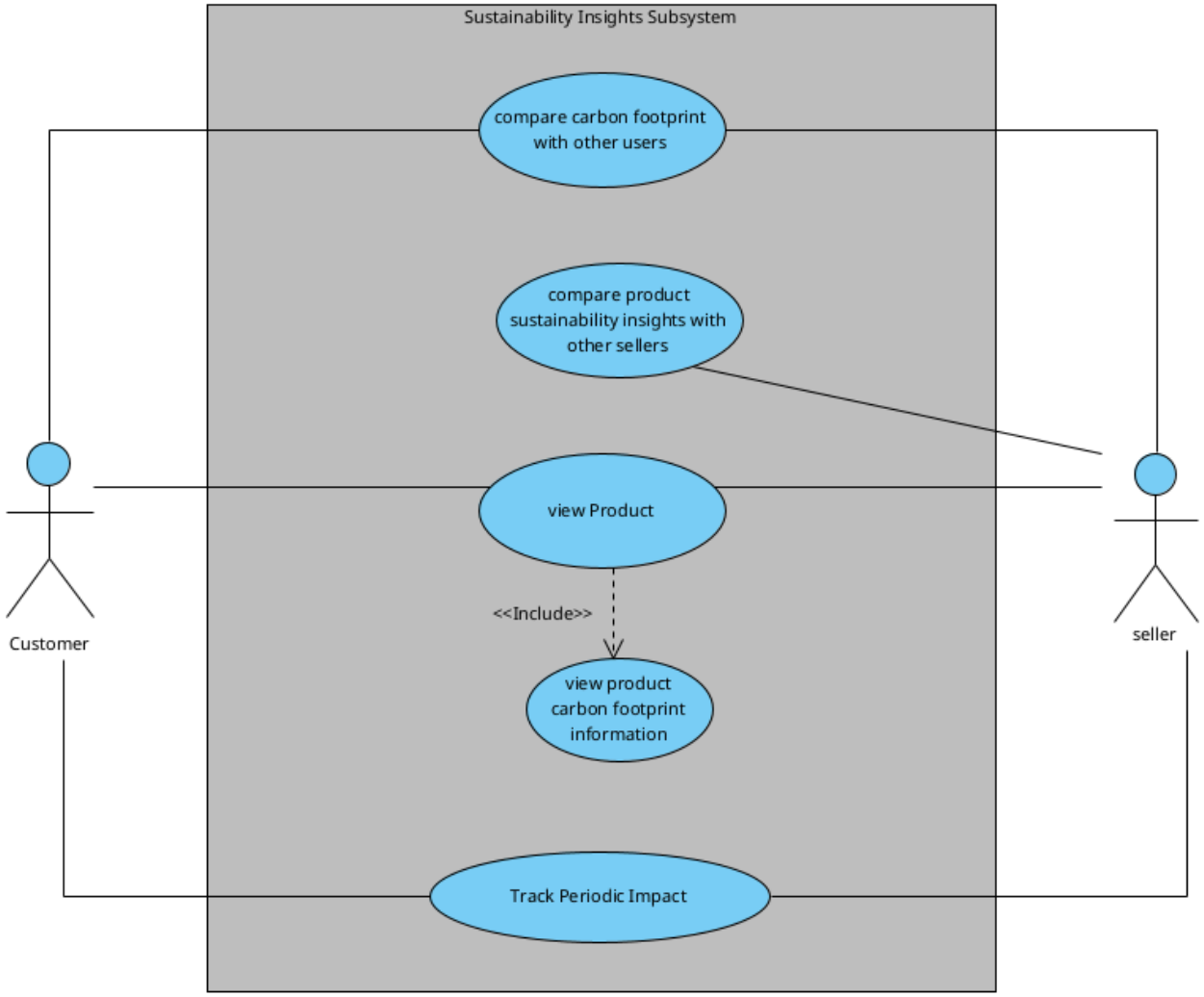
Product Browsing & Discovery Subsystem



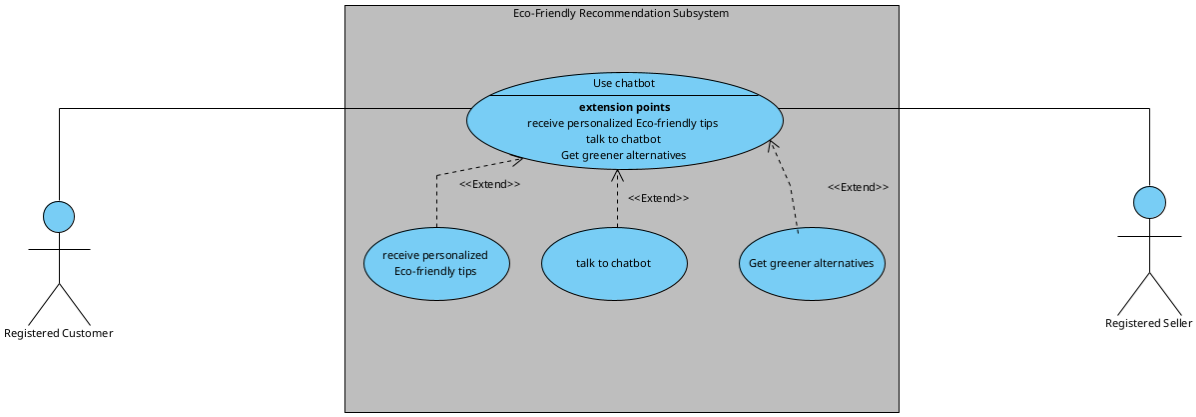
Shopping Cart & Order Processing Subsystem



Sustainability Insights Subsystem

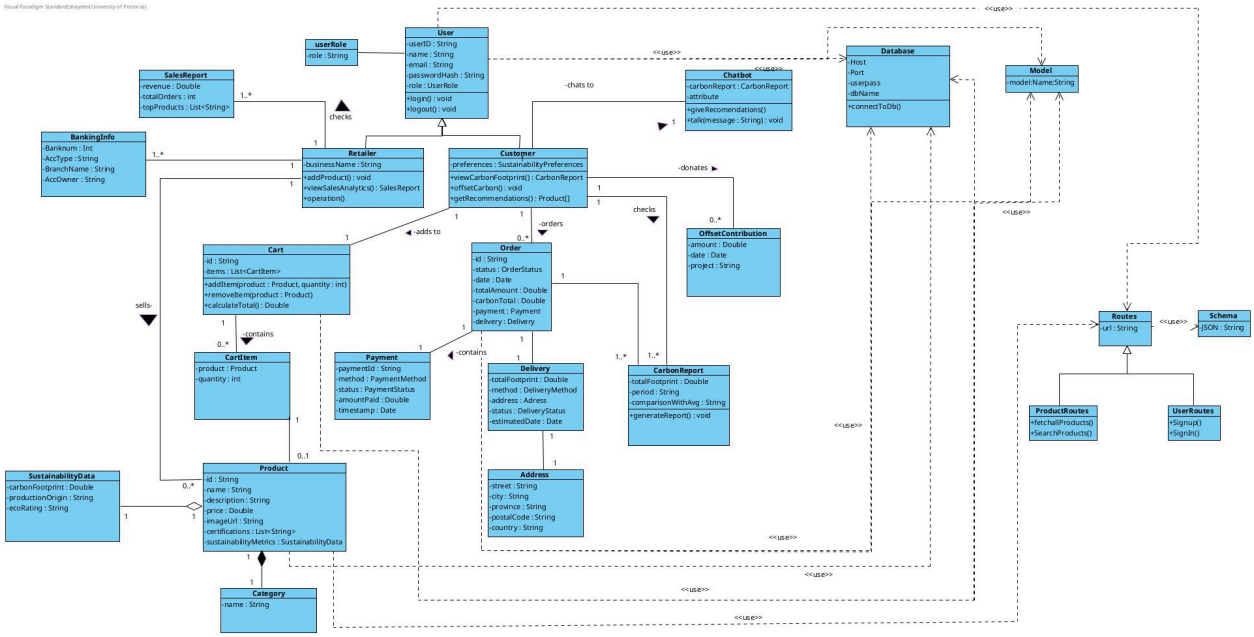


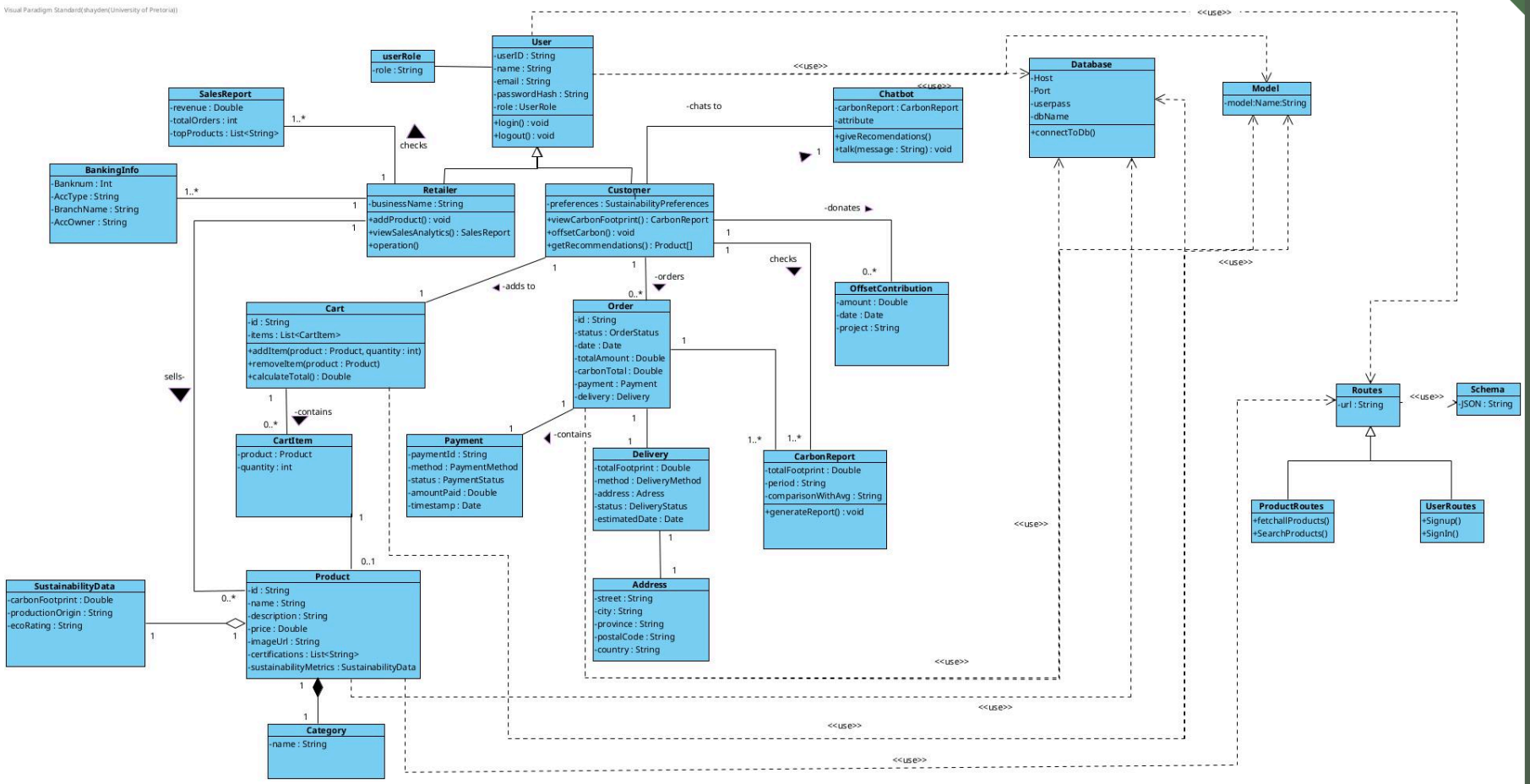
Eco-Friendly Recommendation Subsystem



Donation & Carbon Offset Subsystem

Domain model




Visual Paradigm Standard(shayden(University of Pretoria))
User
-userID : String
-name : String
-email : String
-passwordHash : String
-role : UserRole
+login() : void
+logout() : void
userRole
-role : String
SalesReport
-revenue : Double
-totalOrders : int
-topProducts : List<String>
1..*
checks
BankingInfo
-Banknum : Int
-AccType : String
-BranchName : String
-AccOwner : String
1..*
Retailer
-businessName : String
+addProduct() : void
+viewSalesAnalytics() : SalesReport
+operation()
Customer
-preferences : SustainabilityPreferences
+viewCarbonFootprint() : CarbonReport
+offsetCarbon() : void
+getRecommendations() : Product[]
-chats to
Chatbot
-carbonReport : CarbonReport
-attribute
+giveRecomendations()
+talk(message : String) : void
Database
-Host
-Port
-userpass
-dbName
+connectToDb()
Model
-model:Name:String
<<use>>
-donates
checks
0..*
OffsetContribution
-amount : Double
-date : Date
-project : String
-adds to
-orders
Cart
-id : String
-items : List<CartItem>
+addItem(product : Product, quantity : int)
+removeItem(product : Product)
+calculateTotal() : Double
Order
-id : String
-status : OrderStatus
-date : Date
-totalAmount : Double
-carbonTotal : Double
-payment : Payment
-delivery : Delivery
sells
-contains
CartItem
-product : Product
-quantity : int
Payment
-paymentId : String
-method : PaymentMethod
-status : PaymentStatus
-amountPaid : Double
-timestamp : Date
-contains
Delivery
-totalFootprint : Double
-method : DeliveryMethod
-address : Adress
-status : DeliveryStatus
-estimatedDate : Date
CarbonReport
-totalFootprint : Double
-period : String
-comparisonWithAvg : String
+generateReport() : void
Routes
-url : String
Schema
-JSON : String
ProductRoutes
+fetchallProducts()
+SearchProducts()
UserRoutes
+Signup()
+SignIn()
SustainabilityData
-carbonFootprint : Double
-productionOrigin : String
-ecoRating : String
Product
-id : String
-name : String
-description : String
-price : Double
-imageUrl : String
-certifications : List<String>
-sustainabilityMetrics : SustainabilityData
Address
-street : String
-city : String
-province : String
-postalCode : String
-country : String
Category
-name : String

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**