Eco-Cart+

Eco-Friendly E-commerce Portal with Role-Based Sustainability Evaluation

Problem Statement

E-commerce is evolving, and sustainability is becoming more important, but it always seems to be overlooked. Not only do buyers not have any meaningful understanding of how products affect the environment, but sellers usually do not have a way to communicate their sustainability efforts effectively. Barely any platforms account for carbon emissions from packaging and shipping, and not even one of them holds sellers accountable for their sustainability in practice. They have disconnected experiences, a lack of trust as a result, and they haven't been able to support "green" businesses to the fullest.

Solution

Eco-Cart+ is an interactive, Java Swing-based interface that allows buyers, sellers, audits and logistics partners to work collaboratively in a structured, role-based ecosystem. Eco-Cart+ enables eco-conscious commerce via:

- **Eco-Score Certification:** Eco-scores are verified by an external auditor, based on product information submitted by the seller.
- **Carbon Tracking:** Shipping coordinators will calculate and log delivery-related carbon emissions.
- **Financial Accountability:** Role-based payment flow between the shipping accountant to the seller's accountant.
- **Support Requests:** Tracked customer support inquiries, and disputes are managed transparently.
- **Role-specific dashboards and workspaces:** Each user role has own respective module to perform major tasks and approve workflows to ensure accountability.

Ecosystem Design

I. Network

- Eco-Cart+ Sustainability Marketplace Network

II. Enterprises (4)

1. Seller Enterprise
2. Shipping Enterprise
3. Eco-Certification Enterprise
4. Customer Support Enterprise

III. Organizations (6)

1. Product Organization
2. Order Management Organization
3. Shipping Organization
4. Financial Organization
5. Eco Auditing Organization
6. Customer support

IV. Roles (8 Unique Roles)

1. Admin - can manage all the ecosystem entities, users and enterprises
2. Seller - can add products and submit for eco-certification
3. Product Auditor - can approve or reject bid requests from sellers
4. Eco-Score Auditor - can validate details about the product and assign an Eco-Score
5. Shipping Coordinator - can calculate delivery paths and resulting emissions
6. Shipping Accountant - can invoice sellers for shipping
7. Seller Accountant - can approve payments for sellers shipping
8. Buyer - can purchase products and view sustainability information
9. Customer Support - can receive help requests and issue resolution

Use Cases / Work Requests

1. **Product Submission Request**
   The Seller submits product information, including materials, packaging, and manufacturing information for the eco-certification.
2. **Eco-Score Review and Assignment**
   The Eco Auditor, using reviewed data, assigns an Eco-Score acceptable to the sustainability criteria.
3. **Product Bid Approval Request**
   The Seller submits a bid amount for the product to be listed. The Product Auditor reviews and either approves or rejects the proposed bid based on eco-compliance and fair pricing.

4. **Buyer Purchase Request**

   A Buyer is shopping the platform, which allows them to compare products based on Eco-Score and place an order.

5. **Shipping Coordination Request**

   Once the order has been submitted, the Shipping Coordinator coordinates the delivery and provides the estimated CO_2 emissions for the shipment.

6. **Shipping Cost Submission**

   The Shipping Accountant calculates and submits to the Seller Accountant for the shipping costs.

7. **Shipping Payment Approval**

   The Seller Accountant reviews the shipping costs submitted and approves them before the payment is made.

8. **Customer Support Ticket**

   If any issues arise after the order, the buyer can file a ticket for customer support, which has the customer support role responsible.

9. **Order Completion Notification**

   When an order has been completed successfully, delivered, and paid for, the system informs the relevant parties and logs the transaction into the Buyer and Seller dashboards.

High-Level Component Diagram: