Project Proposal

E-commerce Platform

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Contents

1 Introduction

This project proposes the development of a comprehensive e-commerce platform designed to provide users with a seamless online shopping experience. The platform will implement a robust database design with inheritance relationships and support for multiple payment methods. The system will offer intuitive interfaces for customers and administrators while maintaining data integrity and security.

2 Problem Statement

Many existing e-commerce solutions lack proper data modeling, resulting in inefficient operations and poor user experience. Our platform addresses these issues through well-designed entity relationships, inheritance hierarchies, and streamlined shopping workflows. We aim to create a system that offers both performance and maintainability.

3 Objectives

- Implement a database schema with proper inheritance relationships for users and payments
- Create distinct modules for customers and administrators with appropriate permissions
- Develop a shopping cart and wishlist system with proper one-to-many relationships
- Integrate secure payment processing with multiple payment options
- Build an intuitive product categorization system with hierarchical relationships

4 Scope

The platform will support:

- User management with role-based access control (customers, administrators)
- Product catalog with hierarchical categorization
- Shopping cart and wishlist functionality
- Order processing and shipment tracking
- Multiple payment methods (credit card, PayPal, bank transfer)
- Product reviews and ratings

5 System Architecture

The system follows an object-oriented design with inheritance relationships:

5.1 User Management

The system implements a base User class with specialized Customer and Admin classes, ensuring proper role separation and security.

5.2 Admin Interface

The admin interface emphasizes complete CRUD (Create, Read, Update, Delete) operations:

- **Category Management**: Create, edit, delete, and list categories. This includes maintaining the hierarchical category structure and ensuring referential integrity.
- **Product Management**: Add, edit, delete, and display products. This includes managing product attributes, inventory levels, and category assignments.

5.3 Payment Processing

A Payment superclass with specialized subclasses (CreditCardPayment, PayPalPayment, BankTransferPayment) allows for flexible payment options while maintaining consistent processing workflows.

5.4 Product Management

Products are organized in a hierarchical category structure, allowing for intuitive navigation and filtering.

6 Key Features

- Single customer cart with multiple cart items (one-to-many relationship)
- Personalized wishlists for saving products of interest
- Order tracking with shipment information
- Product review and rating system
- Secure payment processing with multiple payment options

7 Conclusion

This e-commerce platform proposal focuses on implementing proper database design principles including inheritance, one-to-many relationships, and role-based access control. By adhering to these design principles, we aim to create a maintainable, secure, and efficient online shopping experience.