

Use Case Modelling

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Introduction

The Advanced Smart Inventory Stock Management System is designed to streamline inventory management, improve order processing efficiency, and enhance the user experience for customers, store owners, and managers. A clear understanding of the system's core actors and use cases is essential for developing an efficient and scalable application. By analyzing the main users (actors) and their interactions with the system (use cases), we can create a structured overview of how each component works together to achieve the system's objectives. This document aims to provide a detailed breakdown of actors, use cases, flow of events, and a visual use case diagram, forming a foundational framework for the system's development.

Purpose

The purpose of this document is to define and clarify the roles of key actors, outline essential use cases, and provide a clear sequence of events for each interaction in the Advanced Smart Inventory Stock Management System. This document will help ensure that all user requirements are understood and accounted for, facilitating a well-structured and user-centric design. By developing a comprehensive use case diagram and detailing each interaction flow, this document supports the design and implementation phases, ensuring that all functional requirements are met efficiently.

Actors

- Customer
 - Uses the system to browse products, add items to the shopping cart, place orders, and manage their account.
- Store Owner
 - Manages inventory, sets product prices, applies discounts/promotions, and oversees orders.
- Manager
 - Monitors sales data, generates inventory reports, and manages low-stock alerts.
- External Payment Gateway
 - Processes and validates customer payments securely.
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Use Cases

- I. Browse Products
 - a. Customers can browse available products, view details, and filter items based on categories or promotions.
- II. Add to Cart
 - a. Allows customers to add products to their shopping cart for future purchase.
- III. Checkout and Make Payment
 - a. Customers can review their cart, enter payment information, and complete the purchase.
- IV. Manage Inventory
 - a. Store owners can update inventory levels, add new products, and modify product details.
- V. Generate Sales Reports
 - a. Managers generate sales and inventory reports to monitor performance and assist in decision-making.
- VI. Apply Discounts and Promotions
 - a. Store owners can create and apply discounts or promotions on selected products.

Actors and Use Cases Description Table

Actor	Description
Customer	Interacts with the system to view products, manage their cart, make payments, and track their order status.
Store Owner	Oversees inventory management, applies discounts, and monitors order fulfillment.
Manager	Generates reports on sales and inventory, monitors low stock levels, and assists in strategic planning.
External Payment Gateway	Processes and verifies payments securely, interacting with the customer's bank or card provider to confirm the transaction.

Use Case	Description
Browse Products	Customers can view and filter available products in various categories and view details for each item.
Add to Cart	Allows customers to select and add desired items to their shopping cart for later checkout.
Checkout and Make Payment	Enables customers to review cart contents, select a payment method, and complete their purchase securely.
Manage Inventory	Store owners can add, update, or remove products, adjust stock levels, and modify product information as needed.
Generate Sales Reports	Allows managers to view and export reports on sales performance, helping them track inventory levels and sales trends.
Apply Discounts and Promotions	Store owners can create, edit, and remove discounts or promotional offers for specific items to drive sales and customer engagement.

Flow of Events

Browse Products

- i. Primary Flow:
 - a. Customer → selects the "Browse Products" option on the website.
 - b. Controller → retrieves product data from the Model.
 - c. View → displays product listings, allowing the Customer to filter items by category and view details for each item.
- ii. Alternative Flow:
 - a. If no products match the selected filter criteria, the system displays a message indicating "No products found."

Add to Cart

- i. Primary Flow:
 - a. Customer → selects a product and clicks "Add to Cart."
 - b. Controller → updates the Shopping Cart Model with the selected item.
 - c. View → updates to show the item in the cart, displaying quantity and price.
- ii. Alternative Flow:
 - a. If the selected item is out of stock, the system disables the "Add to Cart" option and displays a message that the item is currently unavailable.

Checkout and Make Payment

- i. Primary Flow:
 - a. Customer → proceeds to the shopping cart and initiates checkout.
 - b. Controller → verifies the items in the cart and calculates the total cost.
 - c. View → displays the total amount along with payment options.
 - d. Customer → selects a payment method and confirms the purchase.
 - e. Controller → sends payment information to the External Payment Gateway for processing.
 - f. Upon payment confirmation, Controller → updates the Order Management Model and adjusts inventory levels accordingly. g. View → displays an order confirmation message to the Customer.
- ii. Alternative Flow:
 - a. If payment fails due to insufficient funds or incorrect payment details, the system displays an error message and allows the Customer to re-enter payment information or cancel the checkout process.

Manage Inventory

- i. Primary Flow:
 - a. Store Owner → selects the "Manage Inventory" option.
 - b. Controller → retrieves current inventory data from the Model.
 - c. Store Owner → makes adjustments (adds new products, updates stock levels, modifies product details).
 - d. Controller → updates the Inventory Model with the new information.
 - e. View → reflects the updated inventory data for the Store Owner.
- ii. Alternative Flow:
 - a. If the update fails (e.g., due to a database error), the system displays an error message, allowing the Store Owner to retry or cancel the update.

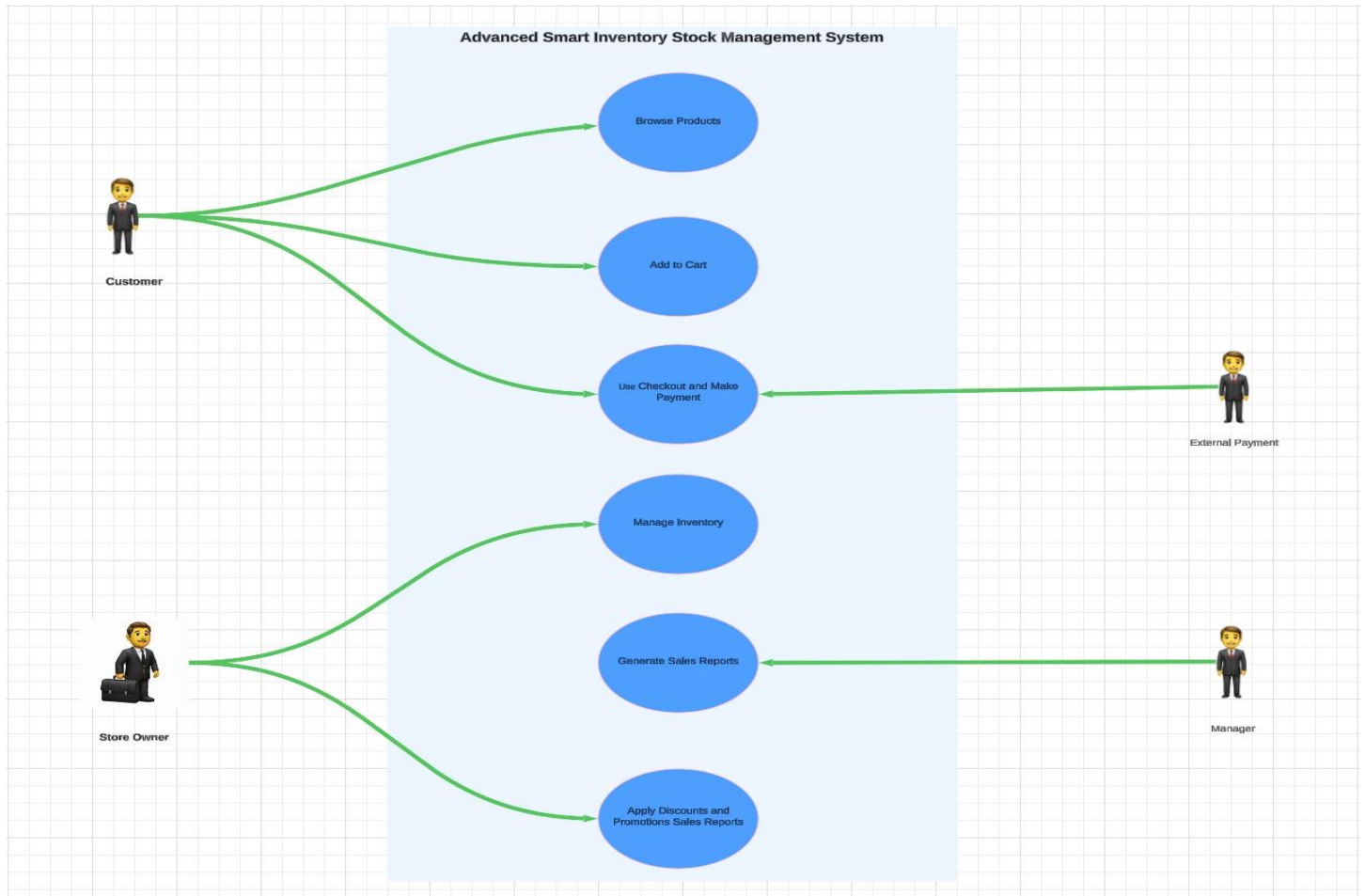
Generate Sales Reports

- i. Primary Flow:
 - a. Manager → selects the "Generate Sales Reports" option.
 - b. Controller → requests report data from the Sales Model.
 - c. Model → compiles sales and inventory data into a report.
 - d. View → displays the report to the Manager in a format suitable for analysis.
 - e. Manager → has the option to export the report as a file (e.g., PDF or CSV).
- ii. Alternative Flow:
 - a. If there is insufficient data to generate the report, the system displays a message indicating that no report can be generated for the selected period.

Apply Discounts and Promotions

- i. Primary Flow:
 - a. Store Owner → selects the "Apply Discounts" option.
 - b. Controller → retrieves applicable products from the Product Model.
 - c. Store Owner → sets discount rates or promotional offers for specific items.
 - d. Controller → updates the Discount Model with the new promotional information.
 - e. View → displays the updated prices to customers on the product and promotional pages.
- ii. Alternative Flow:
 - a. If the discount application fails (e.g., due to incorrect data input), the system prompts the Store Owner to review and correct the discount information before resubmitting.

Use Case Diagram



Conclusion

The Advanced Smart Inventory Stock Management System is carefully designed to enhance inventory control, streamline order processing, and provide a seamless user experience for all actors, including customers, store owners, managers, and external payment processors. This document comprehensively outlines the system's actors, key use cases, and flow of events, establishing a clear and organized framework for understanding the interactions within the system. By implementing these use cases and maintaining structured flow, this project aims to meet the varied requirements of the business while ensuring flexibility, scalability, and efficiency in daily operations.

Through the breakdown of primary and alternative flows, as well as the use case diagram, this document supports a well-rounded understanding of the system's functionality. Each component has been designed to operate in harmony, allowing for easy management of tasks such as browsing products, adding items to the cart, processing payments, and generating sales reports. Additionally, the roles of store owners and managers are equipped with functions to monitor, report, and adjust inventory and promotions, ensuring the system aligns with business needs.