HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

School of Information and communications technology

Software Requirement Specification

Version 1.2

<AIMS Software>

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# Introduction

**AIMS Project** is a desktop-based e-commerce platform designed to manage the sale of physical media products like books, CDs, LPs, and DVDs. It allows product managers to add, edit, and delete items, while customers can browse, order, and pay securely through VNPay. The system supports up to 1,000 concurrent users, offering both standard and express shipping options, with scalable features for future growth.

## Objective

The objective of the AIMS Project is to provide a robust, scalable e-commerce platform that supports the management of media products. It is designed to handle high customer volumes, ensure smooth operations, and offer features like product management, order processing, and secure payment integration. The system aims to provide an efficient and user-friendly experience for both product managers and customers, with future scalability for additional features.

## Scope

The AIMS Project encompasses the following functionalities:

* **Product Management:** Product managers can add, modify, and delete media products (books, CDs, DVDs, etc.) while adhering to security and data integrity constraints.
* **Customer Interaction:** Customers can browse, search, and sort products, add items to the cart, and complete orders with secure payment options through VNPay.
* **Order Processing:** The system manages real-time stock availability, allows for standard and express shipping, and ensures proper transaction records.
* **Scalability and Performance:** The software can serve up to 1,000 concurrent users, with future scope for adding new product categories and payment methods.

## Glossary

## References

# Overall Description

## Survey

The AIMS software is an e-commerce platform designed to facilitate the management and sale of physical media products such as books, CDs, LP records, and DVDs. The software allows various user roles, including administrators, product managers, and customers, to interact with the system according to their specific needs. The software also integrates with VNPay for payment processing and ensures that product inventory, order management, and transaction handling are efficient and secure.

## Overall requirements

*Ảnh có chứa biểu đồ, hình vẽ, hàng

Mô tả được tạo tự động*

## Business process

*<Sequence of use cases, e.g. Use case 1 then use case 2, if a condition matched, do the use case 3… You should visualize the process with activity diagrams>*

# Detailed Requirements

## Use case Place order

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| **Use Case “Place order”**   1. **Use case code**   UC001   1. **Brief Description**   This use case describes the interaction between Customer and Order System when Customer wishes to place order, Customer can add products to the cart, provide shipping information, select a payment method and complete the order   1. **Actors**  * Customer * VnPay System (Payment System)  1. **Preconditions**  * Customer has at least 1 product in cart. * The products are available in stock to fulfill the customer's order.  1. **Basic Flow of Events** 2. Customer requests to place order in the cart 3. AIMS software checks the availability of products in the cart 4. AIMS software displays the form of delivery information with order information 5. Customer enters and submits delivery information (see Table 2) 6. AIMS software calculates and updates order information with shipping fees (see Table 3) 7. The customer asks to pay order 8. The AIMS software calls UC “Pay order” 9. The AIMS software creates and saves a new order 10. The AIMS software makes the cart empty 11. The AIMS software sends email about the order notification and information 12. The AIMS software displays the successful order notification, the order and the transaction information (see Table 4) 13. **Alternative flows**   Table 1-Alternative flows of events for UC Place order   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Location** | **Condition** | **Action** | **Resume location** | |  | At Step 3 | If the products are not available | * The AIMS software notifies that the products in the cart are not available and stay at the use case “View cart” | Use case ends | |  | At Step 5 | If the delivery info is invalid | * AIMS software notifies that the delivery info is invalid (blank or wrong format) | At Step 3 | |  | At Step 5 | If the user chooses to place a rush order | * AIMS software inserts use case “Place rush order” | At Step 6 | |  | At Step 8 | If the order payment is not successful or goes back from payment |  | At Step 5 |  1. **Input data**   Table 2-Input data of delivery infomation   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | |  | Receiver Name |  | Yes |  | Pham Minh Truong | |  | Phone Number |  | Yes | 10 digits | 0946120098 | |  | Province | Choose from a list | Yes |  | Ha Noi | |  | Addres |  | Yes |  | Ho Dam Hong, Hoang Van Thai | |  | Shipping instructions |  | Yes |  |  |  1. **Output data**   Table 3-Output data of order information   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | Title | Title of a media product |  | DVD Phim Siêu Nhân Gao | |  | Price | Price of the corresponding media product | * Comma for thoussands separator * Positive interger * Right alignment | 20,000 |   **Table 4- Output data of general information of order and transaction info**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | **Customer name** |  |  | **PhamMinhTruong** | |  | **Phone number** |  |  | **0946120098** | |  | **Province** |  |  | **Hanoi** | |  | **Address** |  |  | **HoDamHong, Hanoi** | |  | **Total amount** |  | * **Right alignment** * **Vietnamese currency (VNĐ)** * **Vietnamese locale** | **1.200.000 VNĐ** | |  | **Transaction ID** |  |  |  | |  | **Transaction content** |  |  |  | |  | **Transaction date** |  | **dd/mm/yyyy** | **22/10/2024** |  1. **Postconditions**  * The order has been created and successfully paid for. * The invoice and shipping details are sent to the customer via email. * The shopping cart is emptied after payment.   Activity Diagram for UC Place Order |

## Use case Pay Order

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| **Use Case “Pay Order”**   1. **Use case code**   UC002   1. **Brief Description**   This use case describes the interaction between customers and AIMS software when customer wishes to pay order   1. **Actors**  * **Customer** * **VNPay**  1. **Preconditions**   The customer asks to pay order   1. **Basic Flow of Events** 2. AIMS software displays the invoice (see Table 2) 3. Customer asks to pay the invoice 4. AIMS software redirects to VNPay 5. VNPay sends payment result to AIMS software 6. AIMS software saves invoice and payment transaction 7. VNPay notifies the payment result 8. **Alternative flows**   **Table 1-Alternative flows of events for UC Pay order**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Location** | **Condition** | **Action** | **Resume location** | |  | At Step 5 | If the customer cancels the payment transaction |  | At step 1 |  1. **Input data** 2. **Output data**   **Table 2-Output data of invoice**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | Title | Title of a media product |  | DVD Siêu Nhân Gao | |  | Price | Price of the corresponding media produc | * Comma for thousands separator * Positive integer * Right alignment | 123,000 | |  | Quantity | Quantity of the corresponding media | * Positive integer * Right alignment | 2 | |  | Amount | Total money of the corresponding media | * Comma for thousands separator * Positive integer * Right alignment | 246,000 | |  | Subtotal Before VAT | Total price of products in the cart before VAT | * Comma for thousands separator * Positive integer * Right alignment | 2,106,000 | |  | Subtotal | Total price of products in the cart with VAT | 2,316,600 | |  | Shipping fees |  | 30,000 | |  | Total | Sum of subtotal and shipping fees |  | 2,346,600 | |  | Currency |  |  | VND | |  | Name |  |  | Pham Minh Truong | |  | Phone number |  |  | 0946120098 | |  | Province |  |  | Hanoi | |  | Address |  |  | Ho Dam Hong, Ha Noi | |  | Shipping instructions |  |  |  |  1. **Postconditions**  * The order is successfully paid for and marked as "Paid" in the system. * The payment transaction is recorded, and the customer receives a confirmation   email with the invoice and payment details.  Activity Diagram for UC Pay Order |
|  |

## Use case Place Rush Order

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **Use Case “Place Rush Order”**   1. **Use case code**   UC003   1. **Brief Description**   This use case describes the interaction between customers and AIMS software when customer wishes to place rush order   1. **Actors**    1. **Customer** 2. **Preconditions**   The user chooses to place a rush order   1. **Basic Flow of Events** 2. Customer chooses to place a rush order 3. AIMS software checks customer’s address and products in order 4. AIMS software requests additional rush order delivery information 5. Customer enters and submits additional rush order delivery information (see Table 2) 6. AIMS software calculates and updates order information with shipping fees (see Table 3) 7. **Alternative flows**   **Table 1-Alternative flows of events for UC Place rush order**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Location** | **Condition** | **Action** | **Resume location** | |  | At Step 5 | If the addition rush order delivery info is invalid | * AIMS software notifies that the addition rush order delivery info is invalid (blank or wrong format) | At step 3 | |  | At Step 5 | If only certain products are eligible for rush order delivery | * AIMS software calculates and updates order information with shipping fees. Delivery fees will be calculated and displayed separately for regular delivery items (if any) and rush order delivery items. (see Table 4) |  |  1. **Input data**   **Table 2-Input data of additional rush order delivery information**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | |  | Delivery time for rush order delivery |  | Yes | hh:mm | 20:00 | |  | Delivery instructions |  | No |  |  |  1. **Output data**   **Table 3-Output data of order information and shipping fee if all products in the order are eligible for rush order delivery**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | Title | Title of a media product |  | DVD Phim Siêu Nhân Gao | |  | Price | Price of the corresponding media product | * Comma for thousands separator * Positive integer * Right alignment | 20,000 | |  | Quantity | Quantity of the corresponding media | * Positive integer * Right alignment | 2 | |  | Amount | Total money of the corresponding media | * Comma for thousands separator * Positive integer * Right alignment | 40,000 | |  | Subtotal | Total amount of all products in the order |  | 50,000 | |  | Shipping fee |  |  | 30,000 | |  | Total |  |  | 80,000 |   **Table 4-Output data of order information and shipping fee if only certain products are eligible for rush order delivery**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | Title | Title of a media product |  | DVD Phim Vượt ngục | |  | Price | Price of the corresponding media product | * Comma for thousands separator * Positive integer * Right alignment | 123,000 | |  | Quantity | Quantity of the corresponding media | * Positive integer * Right alignment | 2 | |  | Amount | Total money of the corresponding media | * Comma for thousands separator * Positive integer * Right alignment | 246,000 | |  | Subtotal | Total amount of all products in the order |  | 2,316,600 | |  | Shipping fee for regular delivery items |  |  | 10,000 | |  | Shipping fee for rush order delivery items |  |  | 20,000 | |  | Total |  |  | 2,346,600 |  1. **Postconditions**  * The order is successfully created, and the payment transaction is recorded. * The customer receives an order confirmation email, including rush delivery   details.   * The products will be delivered according to the requested rush delivery time.   Activity Diagram for UC Pay Rush Order |

# Supplementary specification

## Functionality

* User Authentication and Authorization
  + The system must allow administrators and product managers to log in using secure credentials.
  + Each user must have a defined role (e.g., administrator, product manager, or customer), and only users with the appropriate role can access specific functionalities (e.g., only administrators can create new users).
  + The system should allow users to change their passwords and enforce password strength requirements (e.g., minimum length, special characters).
* User Management
  + Administrators can create, update, view, or delete user accounts.
  + Administrators can assign role to a single user.
  + Administrators can block or unblock users, reset passwords, and the system will automatically send email notifications for any of these actions.
* Product Management
  + Product managers can add, view, update, and delete media products, including books, CDs, DVDs, and LP records.
  + The system must ensure product data includes essential details such as title, category, value, and current price.
  + Product managers can modify the price of a product up to two times a day, but prices must remain within 30% to 150% of the product's value.
  + The system must prevent the deletion of more than 30 products at once for security reasons but allow the deletion of up to 10 products in a single action.
* Inventory Management
  + The system will maintain accurate inventory records, updating stock levels whenever products are added, sold, or removed.
  + If the stock quantity is insufficient when customers attempt to place an order, the system will notify them and provide the available quantity for updating the cart.
  + Product managers must be able to track inventory levels and receive alerts if stock is low or unavailable.
* Order Placement
  + Customers can browse and search for products, with the system displaying up to 20 products per page.
  + The system must allow customers to add products to a cart and modify the contents before proceeding to checkout.
  + During checkout, customers must provide delivery and payment information. The system will calculate VAT and delivery fees based on product weight and location.
  + The system will connect to VNPay for payment processing, and the order will remain in "Pending" status until the payment is confirmed.
* Order Management
  + Product managers can view up to 30 pending orders per page and approve or reject them.
  + Rejected orders will automatically trigger an email notification to the customer.
  + The system should allow product managers to cancel or reject orders for reasons such as insufficient stock or delivery issues.
* Transaction History
  + The system will log all product management activities (e.g., addition, update, deletion) and all orders placed by customers.
  + Customers can view their order history and receive transaction details, including payment and shipping information, via email.
  + The system must record all payment and refund transactions for reference and tracking.
* Email Notifications
  + The system will send email notifications to customers and product managers for order confirmations, cancellations, and status updates.
  + Users will receive notifications related to account activities such as password resets or role changes.

## Usability

* Ease of Use:
  + Intuitive UI with minimal clicks for actions like browsing and ordering.
  + Clear instructions and consistent layout across the system.
* Feedback & Validation:
  + Clear confirmation and error messages.
  + Validations for inputs (e.g., product details, delivery info).
* Search & Navigation:
  + Efficient search filters with fast loading (2 seconds).
  + Simple pagination with 20 items per page.
* Minimal Training:
  + Easy-to-use for all actors with a basic user guide.

## Reliability

* System Uptime
  + The system must be available 24/7, with a minimum uptime of 99.5%, ensuring reliable access for users at all times.
* Mean Time Between Failures (MTBF)
  + The system should have a mean time between failures (MTBF) of at least 300 hours, ensuring consistent performance over extended periods.
* Incident Recovery Time
  + In case of a system failure, the system must resume normal operations within a maximum of 1 hour after an incident.

## Performance

* Response Time
  + Product Search: The system must return search results within 2 seconds under normal conditions and within 5 seconds during peak hours.
  + Order Placement: The system should complete the order placement process, including payment processing, within 3 minutes.
  + Cart Updates: Any changes to the cart, such as adding or removing products, should be reflected in under 2 seconds.
* System Throughput
  + Simultaneous Users: The system must support up to 1,000 simultaneous users without significant degradation in performance.
* Data Handling
  + Product Management: Updates to product information (adding, editing, deleting) should be processed within 5 seconds for each action.
  + Order Management: The system should handle order status updates and management tasks in less than 5 seconds per operation

## Supportability

* Modular Architecture
  + The system should be designed with a modular architecture, allowing for easy updates and maintenance of individual components (e.g., product management, order processing) without affecting the entire system.
* Code Documentation
  + All code should be thoroughly documented, including inline comments and external documentation, to facilitate understanding and modification by future developers.
* Error Logging and Monitoring
  + The system must implement comprehensive error logging and monitoring tools to track and diagnose issues efficiently. Logs should be easily accessible and include detailed information for troubleshooting.

## Other requirements