HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

School of Information and communications technology

Software Requirement Specification

Version 1.2

<AIMS project>

Subject: <ITSS>

<Group Number:22>

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# Introduction

## Objective

The objective of this document is to define the software requirements for the **Advanced Inventory Management System (AIMS)**. This document specifies the functional and non-functional requirements that the system must meet, ensuring a clear understanding for all stakeholders. The information provided will serve as a guideline for developers and designers to implement the system correctly, without including any design or implementation details.

## Scope

The **Advanced Inventory Management System (AIMS)** is a software solution designed to facilitate the buying, selling, and management of **physical media products**, including books, CDs, LP records, and DVDs. The system provides a streamlined process for **customers, product managers, and administrators**, ensuring efficient inventory control, order processing, and secure transactions.

AIMS will enable **customers** to browse products, add items to their cart, and place orders without requiring an account. The system integrates with the **VNPay payment gateway** to facilitate secure credit card transactions. Customers can track their orders, receive invoices via email, and cancel orders before they are processed. Additionally, **rush order delivery** is available for eligible locations.

For **product managers**, AIMS allows efficient product inventory management, including adding, updating, and removing products while maintaining pricing and stock constraints. They can also review, approve, or reject pending orders based on stock availability and operational factors.

**Administrators** will have full control over user management, including creating, updating, and deleting user accounts, assigning roles, and enforcing security policies. They can also block or unblock users and ensure compliance with system rules.

The system ensures compliance with **pricing policies, tax regulations, and inventory constraints**, preventing unauthorized modifications and enforcing business rules. It does **not** support digital products, multi-currency transactions, or alternative payment methods beyond VNPay within the current scope.

By automating and optimizing key business processes, AIMS enhances **operational efficiency, improves customer experience, and ensures secure, seamless transactions** for all stakeholders.

## Glossary

| ***No*** | ***Term*** | ***Explanation*** | ***Example*** | ***Note*** |
| --- | --- | --- | --- | --- |
| 1 | token | A piece of data created by server, and contains the user's information, as well as a special token code that user can pass to the server with every method that supports authentication, instead of passing a username and password directly. | JSON Web Token (JWT) | Compact, URL-safe and usable especially in web browser single sign-on (SSO) context. |
| 2 | AIMS | | Advanced Inventory Management System, the software being developed to handle product inventory, customer orders, and payment processing. | | --- |  |  | | --- | |  | | Refers to the system throughout this document. | | --- |  |  | | --- | |
| 3 | VNPay | | A third-party payment gateway integrated into AIMS for secure credit card transactions. | | --- |  |  | | --- | | | VNPay Sandbox | | --- |  |  | | --- | | | Used for processing payments and refunds. | | --- |  |  | | --- | |
| 4 | | **VAT** | | --- |  |  | | --- | | | Value-Added Tax, an indirect tax applied to goods and services. | | --- |  |  | | --- | | | 10% VAT in AIMS | | --- |  |  | | --- | | | The system calculates product prices both with and without VAT. | | --- |  |  | | --- | |
| 5 | | **Rush Order** | | --- |  |  | | --- | | | A special delivery service that allows customers to receive products within **2 hours** if they meet eligibility requirements. | | --- |  |  | | --- | | | Rush order in Hanoi districts | | --- |  |  | | --- | | | Not available for all locations or products. | | --- |  |  | | --- | |
| 6 | **Cart** | | A virtual shopping basket where customers can add products before making a purchase. | | --- |  |  | | --- | | | Adding a book to the cart | | --- |  |  | | --- | | | The cart is emptied after a successful order. | | --- |  |  | | --- | |
| 7 | | **Order Processing** | | --- |  |  | | --- | | | The steps taken from placing an order to confirming stock, processing payment, and approving the order for shipment. | | --- |  |  | | --- | |  |  |

## References

1. IEEE 830-1998 – Recommended Practice for Software Requirements Specifications
2. VNPay API Documentation
3. Company Product Management Guidelines

# Overall Description

## Survey

*The* ***Advanced Inventory Management System (AIMS)*** *is designed to facilitate the management and sale of* ***physical media products*** *(books, CDs, LP records, DVDs). The system serves three primary user roles:*

1. ***Customers*** *– Browse products, add items to cart, place orders, and make payments. They can also track or cancel orders before processing.*
2. ***Product Managers*** *– Manage product inventory (add, edit, delete), approve/reject orders, and ensure stock availability.*
3. ***Administrators*** *– Manage users, assign roles, reset passwords, and oversee security policies.*

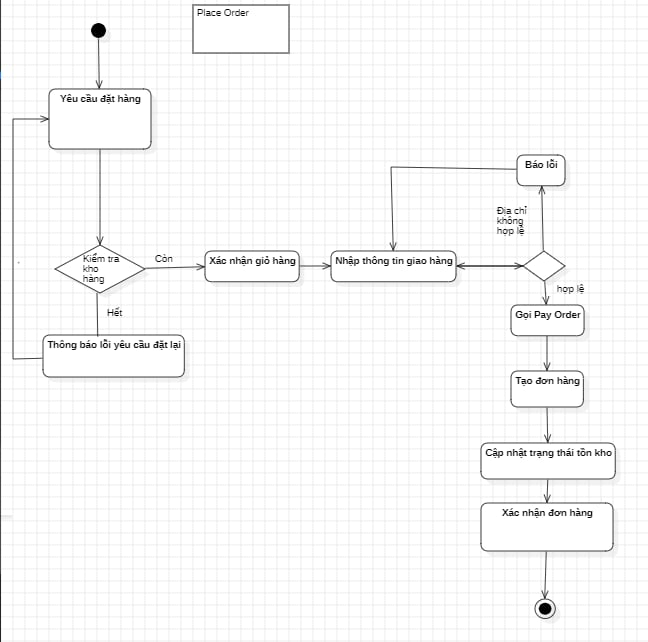
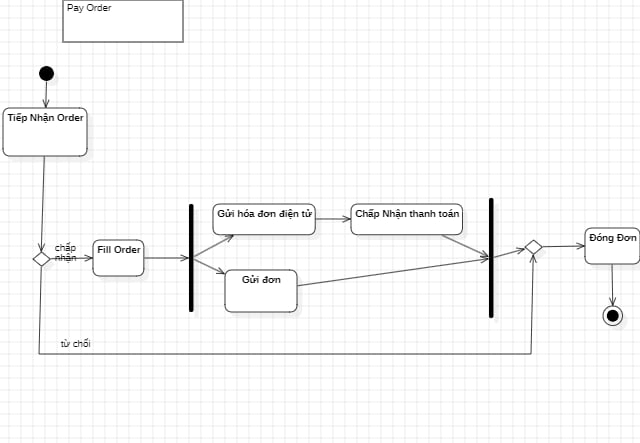
*The system ensures* ***secure payment processing*** *via* ***VNPay*** *and supports* ***rush order delivery*** *within eligible locations. Customers do not need to log in to place an order, but* ***product managers and administrators must authenticate*** *to access their features.*

## Overall requirements

*A* ***use case diagram*** *is provided below to illustrate the interactions between* ***customers and the system****.*

* *Search product detail*
* *Review product detail*
* *Add/Update product*
* *Place order*
* *Pay order*
* *Place rush order*

Business process

*  
*

# Detailed Requirements

<*This section contains all the software requirements at a level of detail sufficient to enable designers to design a system to satisfy those requirements, and testers to test that the system satisfies those requirements. Throughout this section, every stated requirement should be externally perceivable by users, operators, or other external systems. These requirements should include at a minimum a description of every input (stimulus) into the system, every output (response) from the system and all functions performed by the system in response to an input or in support of an output. The following principles apply:*

1. *Specific requirements should be stated with all the characteristics of a good SRS*

* *correct*
* *unambiguous*
* *complete*
* *consistent*
* *ranked for importance and/or stability*
* *verifiable*
* *modifiable*
* *traceable*

1. *Specific requirements should be cross-referenced to earlier documents that relate*
2. *All requirements should be uniquely identifiable (usually via numbering like 3.1.2.3)*
3. *Careful attention should be given to organizing the requirements to maximize readability (Several alternative organizations are given at end of document)*

*Before examining specific ways of organizing the requirements it is helpful to understand the various items that comprise requirements as described in the following subclasses. This section reiterates section 2, but is for developers not the customer. The customer buys in with section 2, the designers use section 3 to design and build the actual application.*

*Remember this is not design. Do not require specific software packages, etc unless the customer specifically requires them. Avoid over-constraining your design. Use proper terminology:*

*The system shall… A required, must have feature*

*The system should… A desired feature, but may be deferred til later*

*The system may… An optional, nice-to-have feature that may never make it to implementation.*

*Each requirement should be uniquely identified for traceability. Usually, they are numbered 3.1, 3.1.1, 3.1.2.1 etc. Each requirement should also be testable. Avoid imprecise statements like, “The system shall be easy to use” Well no kidding, what does that mean? Avoid “motherhood and apple pie” type statements, “The system shall be developed using good software engineering practice”*

*Avoid examples, this is a specification, a designer should be able to read this spec and build the system without bothering the customer again. Don’t say things like, “The system shall accept configuration information such as name and address”. The designer doesn’t know if that is the only two data elements or if there are 200. List every piece of information that is required so the designers can build the right UI and data tables*>

## Use case 1

| **Use Case “View Product detail”**   1. **Use case code**   UC001   1. **Brief Description**   This use case describes the interaction between **customers** and **AIMS** when customers wish to view detailed information about a product.   1. **Actors**    1. **Customer** 2. **Preconditions**   The customer has launched the AIMS applications  The system contains available product data   1. **Basic Flow of Events** 2. The **customer** selects a product from the **product list screen**. 3. The **software** retrieves product details from the database. 4. The **software** displays the detailed product information on the **product detail screen** (see Table B). 5. **Alternative flows**   **Table N-Alternative flows of events for UC Place order**   | **No** | **Location** | **Condition** | **Action** | **Resume location** | | --- | --- | --- | --- | --- | |  | At Step 2 | | If the selected product is no longer available in the system | | --- |  |  | | --- | | | * Display an error message:"This product is no longer available." | | --- |  |  | | --- | | | Use case ends | | --- |  |  | | --- | | |  | At Step 2 | | If there is a system error while retrieving product details | | --- |  |  | | --- | | | * Display an error message: "Failed to load product details. Please try again later." | | --- |  |  | | --- | | Use case ends |  1. **Input data**   **Table A-Input data of …**   | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | | --- | --- | --- | --- | --- | --- | |  | | Product ID | | --- |  |  | | --- | | | Unique identifier of the selected product | | --- |  |  | | --- | | | Yes | | --- |  |  | | --- | | | Must exist in the database | | --- |  |  | | --- | | 12345 |  1. **Output data**   **Table B-Output data of …**   | **No** | **Data fields** | **Description** | **Display format** | **Example** | | --- | --- | --- | --- | --- | |  | | Product Title | | --- |  |  | | --- | | | Name of the product | | --- |  |  | | --- | | Text | “Ngày em đẹp nhất” | |  | Category | | Product category | | --- |  |  | | --- | | Text | | "CD" | | --- |  |  | | --- | | |  | | Value | | --- |  |  | | --- | | | Base value of the product before VAT | | --- |  |  | | --- | | | Numeric (VND) | | --- |  |  | | --- | | | 100,000 VND | | --- |  |  | | --- | | |  | | Current Price | | --- |  |  | | --- | | | Selling price excluding VAT | | --- |  |  | | --- | | | Numeric (VND) | | --- |  |  | | --- | | | 120,000 VND | | --- |  |  | | --- | | |  | | Description | | --- |  |  | | --- | | | Product description (e.g., new, used) | | --- |  |  | | --- | | Text | | "New, hardcover" | | --- |  |  | | --- | | |  | Barcode | | Product barcode | | --- |  |  | | --- | | | Alphanumeric | | --- |  |  | | --- | | | "9781234567890" | | --- |  |  | | --- | | |  | | Stock Quantity | | --- |  |  | | --- | | | Number of available units | | --- |  |  | | --- | | | Numeric | | --- |  |  | | --- | | 15 | |  | | Dimensions | | --- |  |  | | --- | | | Product dimensions | | --- |  |  | | --- | | Text | | "20cm x 15cm x 5cm" | | --- |  |  | | --- | | |  | | Weight | | --- |  |  | | --- | | | Product weight | | --- |  |  | | --- | | | Numeric (kg) | | --- |  |  | | --- | | | 0.05 kg | | --- |  |  | | --- | | |  | | Additional Info | | --- |  |  | | --- | | | Extra details depending on product type | | --- |  |  | | --- | | Text | "Author: F. Scott Fitzgerald, Publisher: Scribner, Language: English" |  1. **Postconditions**   **-** The customer successfully views the product details.  -The customer may choose to add the product to the cart or return to the product list screen. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## Use case 2

| **Use Case “Search Product”**   1. **Use case code**   UC002   1. **Brief Description**   This use case describes the interaction between **customers** and **AIMS** when customers wish to search for a product by entering keywords or using filters.   1. **Actors**    1. **Customer** 2. **Preconditions**   The customer has launched the AIMS applications  The system contains product data   1. **Basic Flow of Events**   1. The **customer** navigates to the **search bar** on the product list screen. 2. The **customer** enters a keyword (e.g., product name, category, or barcode) in the search field (see Table A).  3. The **software** retrieves the matching products from the database. 4. The **software** displays the list of search results on the **product list screen** (see Table B).  **Alternative flows**  **Table N-Alternative flows of events for UC Place order**   | **No** | **Location** | **Condition** | **Action** | **Resume location** | | --- | --- | --- | --- | --- | |  | | Step 3 | | --- |  |  | | --- | | | | If no matching product is found | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | * Display an error message: "No products found. Please try another keyword." | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Use case ends | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | |  | | Step 3 | | --- |  |  | | --- | | | | If there is a system error while retrieving search results | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | * Display an error message: "Search function is currently unavailable. Please try again later." | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Use case ends |  1. **Input data**   **Table A-Input data of …**   | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | | --- | --- | --- | --- | --- | --- | | 1 | | | Search Keyword | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Text input to find products by name, category, or barcode | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Yes | | --- |  |  | | --- | | | | At least 1 character long | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | "Laptop" | | --- |  |  | | --- | | | | 2 | | --- |  |  | | --- | | | Search Filters | | --- |  |  | | --- | | | Optional filters (e.g., price range, category, brand) | | --- |  |  | | --- | | No | | Valid category and range | | --- |  |  | | --- | | Category: "Electronics", Price: "1,000,000 - 5,000,000 VND" |  1. **Output data**   **Table B-Output data of …**   | **No** | **Data fields** | **Description** | **Display format** | **Example** | | --- | --- | --- | --- | --- | | 1 | | | Product Name | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Name of the matching product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Text | | "MacBook Air M2" | | --- |  |  | | --- | | | 2 | Category | | Product category | | --- |  |  | | --- | | Text | | | "Laptop" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 3 | | | Price | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Selling price of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Numeric (VND) | | --- |  |  | | --- | | | | 25,000,000 VND | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 4 | | | Stock Status | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Availability of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Text | | --- |  |  | | --- | | | | "In Stock" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 5 | | | Product Image | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Thumbnail image of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Image | | "MacBook\_Air\_M2.jpg" | | --- |  |  | | --- | |  1. **Postconditions**   **-** The customer successfully views the **search results**.  -The customer may choose to **view product details** or refine the search. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## Use case 3

| **Use Case “Place Rush Order”**   1. **Use case code**   UC003   1. **Brief Description**   This use case describes the interaction between **customers** and **AIMS** when customers wish to plays an order which can be received within a prearranged time frame of 2 hours via AIMS software.   1. **Actors**    1. **Customer** 2. **Preconditions**   The customer must have at least 1 available item in order   1. **Basic Flow of Events**   1. Software check whether items in order and delivery address can be applied rush order option. 2. Software display from for additional information for rush order.  3. AIMS software validate additional information for rush order.  4. Software validate additional information for rush order.  5. Software display information for rush order process.  6. AIMS call use case “Place Order” .    **Alternative flows**  **Table 1-Alternative flows of events for UC Place order**   | **No** | **Location** | **Condition** | **Action** | **Resume location** | | --- | --- | --- | --- | --- | | 1 | | Step 1 | | --- |  |  | | --- | | | | If all products in order can not be applied rush order option | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | AIMS software notifies that all items can not be applied rush option | | | Use case ends | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 2 | | Step 1 | | --- |  |  | | --- | | | | If delivery address can not be applied rush order option | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | AIMS software notifies that delivery address can not be applied rush order option | Use case ends | | 3 | | Step 4 | | --- |  |  | | --- | | If customer invalid information order | AIMS software notifies invalid additional information for rush order | Resumes step 2 |  1. **Input data**   **Table A-Input data of …**   | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | | --- | --- | --- | --- | --- | --- | | 1 | | | Estimated arrive time | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Datetime input | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Yes | | --- |  |  | | --- | | | | Can not earlier than the time when order is accepted | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 12:00 am | | --- |  |  | | --- | | | | 2 | | --- |  |  | | --- | | Delivery instruction | | Text input | | --- |  |  | | --- | | No | | No | | --- |  |  | | --- | | The items in order are fragile |  1. **Output data**   **Table B-Output data of …**   | **No** | **Data fields** | **Description** | **Display format** | **Example** | | --- | --- | --- | --- | --- | | 1 | | | Product Name | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Rush Order process description | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Right alignment | | If only certain products are eligible for rush order delivery, these items will be delivered together to the designated rush order delivery location at the prearranged time. | | --- |  |  | | --- | | | 2 | Applied items | | Items applied rush order | | --- |  |  | | --- | | Right alignment, comma for item seperator | | |  | | --- |   “CD123” | | --- | --- |  |  | | --- | | | 3 | | | Unap plied items | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Items that can not be applied rush order | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Right alignment, comma for item seperator | | --- |  |  | | --- | | | | “Laptop Dell” | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | |  1. **Postconditions**   - The customers successfully register for rush order service if their order is valid for rush order  - The customers received notification to change delivery method or order information if their order is not valid for rush order |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

## Use case 4

| **Use Case “Add Product”**   1. **Use case code**   UC004   1. **Brief Description**   This use case describes the interaction between **customers** and **AIMS** when customers wish to add a product to cart through product display menu   1. **Actors**    1. **Customer** 2. **Preconditions**   The system has the product available   1. **Basic Flow of Events**   1. Customer requests to add an item to the cart 2. Software requests detailed information of the added product (quantity, color, size,...)  3. Customer provides information  4. Software checks the availability of product  5. Software display product in customer’s cart    **Alternative flows**  **Table N-Alternative flows of events for UC Add Product**   | **No** | **Location** | **Condition** | **Action** | **Resume location** | | --- | --- | --- | --- | --- | |  | | Step 1 | | --- |  |  | | --- | | | | If customer hasn’t log in | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Call use case log in | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Step 2 | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | |  | | Step 4 | | --- |  |  | | --- | | | | If the remaining quantity can’t afford request | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Display an error message: "There is not enough product." | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Use case ends |  1. **Input data**   **Table A-Input data of Use case Add Product**   | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | | --- | --- | --- | --- | --- | --- | | 1 | | | Quantity | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Number of product that customer want to order | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Yes | | --- |  |  | | --- | | | |  | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 3 | | --- |  |  | | --- | | | | 2 | | --- |  |  | | --- | | | Color | | --- |  |  | | --- | | Selected from a list   |  | | --- |  |  | | --- | | Yes | |  | | --- |  |  | | --- | | Blue | | 3 | Size | Select from a list | Yes |  | 10 cm |  1. **Output data**   **Table B-Output data of Use case Add Product**   | **No** | **Data fields** | **Description** | **Display format** | **Example** | | --- | --- | --- | --- | --- | | 1 | | | Product Name | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Name of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Text | | "MacBook Air M2" | | --- |  |  | | --- | | | 2 | Category | | Product category | | --- |  |  | | --- | | Text | | | "Laptop" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 3 | | | Price | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Selling price of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Numeric (VND) | | --- |  |  | | --- | | | | 25,000,000 VND | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 4 | | | Stock Status | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Availability of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Text | | --- |  |  | | --- | | | | "In Stock" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 5 | | | Product Image | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Thumbnail image of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Image | | "MacBook\_Air\_M2.jpg" | | --- |  |  | | --- | | | 6 | Quantity | Product’s quantity | Numeric | 3 |  1. **Postconditions**   **-** The customer’s cart contain the item  -The customer may choose to **view product details** in the cart. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## Use case 5

| **Use Case “Update Product”**   1. **Use case code**   UC005   1. **Brief Description**   This use case describes the interaction between **customers** and **AIMS** when customers wish to adjust the quantity ò product in cart   1. **Actors**    1. **Customer** 2. **Preconditions**   Customer has the product in cart   1. **Basic Flow of Events**   1. Customer requests to modify an item in cart 2. Software requests updated information of the product (quantity, color, size,...)  3. Customer provides information  4. Software checks the availability of product  5. Software display new information of the product in customer’s cart    **Alternative flows**  **Table N-Alternative flows of events for UC Update Product**   | **No** | **Location** | **Condition** | **Action** | **Resume location** | | --- | --- | --- | --- | --- | |  | | Step 2 | | --- |  |  | | --- | | | | If the quantity is set to 0 | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Call use case remove from cart | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Use case ends | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | |  | | Step 4 | | --- |  |  | | --- | | | | If the remaining quantity can’t afford request | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Display an error message: "There is not enough product." | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Use case ends |  1. **Input data**   **Table A-Input data of Use case Add Product**   | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | | --- | --- | --- | --- | --- | --- | | 1 | | | Quantity | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Number of product that customer want to order | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Yes | | --- |  |  | | --- | | | |  | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 3 | | --- |  |  | | --- | | | | 2 | | --- |  |  | | --- | | | Color | | --- |  |  | | --- | | Selected from a list   |  | | --- |  |  | | --- | | Yes | |  | | --- |  |  | | --- | | Blue | | 3 | Size | Select from a list | Yes |  | 10 cm |  1. **Output data**   **Table B-Output data of Use case Update Product**   | **No** | **Data fields** | **Description** | **Display format** | **Example** | | --- | --- | --- | --- | --- | | 1 | | | Product Name | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Name of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Text | | "MacBook Air M2" | | --- |  |  | | --- | | | 2 | Category | | Product category | | --- |  |  | | --- | | Text | | | "Laptop" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 3 | | | Price | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Selling price of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Numeric (VND) | | --- |  |  | | --- | | | | 25,000,000 VND | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 4 | | | Stock Status | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Availability of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | Text | | --- |  |  | | --- | | | | "In Stock" | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | 5 | | | Product Image | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | | | Thumbnail image of the product | | --- |  |  | | --- | | | --- | --- | --- |  |  | | --- | | Image | | "MacBook\_Air\_M2.jpg" | | --- |  |  | | --- | | | 6 | Quantity | Product’s quantity | Numeric | 3 |  1. **Postconditions**   **-** The customer’s cart contain the item  -The customer may choose to **view product details** in the cart. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

# Supplementary specification

## Functionality

* The system shall allow customers to browse, search, and view product details without requiring login.
* The system shall allow customers to add products to their shopping cart and modify the cart contents.
* The system shall support order placement, including normal orders and rush orders.
* Product managers shall be able to add, update, and remove products from inventory.
* Administrators shall manage user accounts, including creating, updating, and disabling accounts.
* The system shall log all significant events, including product changes, order placements, and user management actions, for audit purposes.
* All actions involving inventory changes or financial transactions shall require authentication and authorization.

## Usability

* The AIMS system will provide a user-friendly and easy-to-navigate interface for customers, product managers, and administrators.
* The interface will support multiple platforms, including desktops, tablets, and mobile devices, without compromising the user experience.
* Users do not need to log in to perform basic shopping actions such as browsing products, searching, and placing orders.
* The system will provide intuitive guidance, tooltips, and detailed error messages to help users enter information correctly.
* The average time for a customer to complete an order should not exceed **3 minutes**, including selecting products, entering delivery information, and making a payment.
* The product search function will support smart keyword suggestions and advanced filters to help customers quickly find their desired products.
* The system will retain the shopping cart throughout the session, preventing data loss if customers do not complete their orders.
* The loading time for product and cart pages should not exceed **2 seconds** to ensure a smooth user experience.

## Reliability

* The AIMS system will operate **24/7** with **99.9% uptime**, ensuring continuous service availability for customers.
* The system can serve up to **1,000 simultaneous customers** without significant performance degradation.
* The **Mean Time Between Failures (MTBF)** should be at least **300 hours**, ensuring system stability.
* The system can automatically recover within **1 hour** after a failure or technical issue.
* Automated data backups will occur every **12 hours**, ensuring order and product data integrity.
* In case of an interruption, the system will resume the user session after recovery, preventing order loss or input data loss.
* The system will immediately send order confirmation emails after customers complete their payment.
* Payment data will be encrypted and processed through **VNPay** to ensure security and minimize fraud risks.

## Performance

* The system shall support up to 1,000 concurrent users without performance degradation.
* Search results shall be displayed within **2 seconds** for keyword searches with fewer than 100 matching products.
* Product detail pages shall load within **2 seconds** under normal traffic conditions.
* The inventory update process shall complete within **1 second** after a product is added, updated, or removed.
* System backups shall not impact system performance and shall complete within **30 minutes**.

## Supportability

* The system shall provide comprehensive logging for error diagnosis, user activities, and system events.
* Error logs shall capture relevant request data to assist in root cause analysis.
* The system shall support remote monitoring for system health, including CPU, memory, disk usage, and application-level metrics.
* The system shall support configuration changes (e.g., tax rates, delivery zones) without requiring code changes.
* New product categories and product attributes shall be configurable through the admin interface.
* The system shall allow easy integration with external services (e.g., email service, SMS notifications) through configurable APIs.

## Other requirements

* Compliance: The system shall comply with **Vietnamese e-commerce regulations**, including tax collection, invoice issuance, and consumer protection rules.
* Security: All sensitive data, including passwords and payment data, shall be encrypted at rest and in transit.
* Scalability: The system shall support vertical and horizontal scaling to handle future growth in product listings and user traffic.
* Localization: The system shall support Vietnamese and English language options.
* Mobile Support: The system shall provide a responsive user interface suitable for desktop, tablet, and mobile devices.
* Data Retention: Customer order data shall be retained for at least **5 years** to meet regulatory and business requirements.