## Use case “Place Rush Order”

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Use Case “Place Rush Order”**   1. **Use case code**   UC003   1. **Brief Description**  * This use case describes the process by which a customer places an order with the option for rush order delivery, allowing eligible items to be delivered within a 2-hour prearranged timeframe to addresses within the inner city of Hanoi districts. The system verifies eligibility, calculates fees, and prompts the customer for additional information as needed.  1. **Actors**  * **Customers** * **System**  1. **Preconditions**  * The customer is logged into the system. * The customer has added at least one item to their shopping cart. * The system has access to the customer's delivery address and product eligibility data.  1. **Basic Flow of Events**  * The customer initiates the checkout process and selects the "Rush Order Delivery" option. * The system checks if the delivery address is within the inner city of Hanoi districts. * The system verifies whether any products in the cart are eligible for rush order delivery. * If both the address and at least one product are eligible:   + The system prompts the customer to provide additional rush order delivery information (e.g., delivery time within the next 2 hours, delivery instructions).   + The system informs the customer:     - Which items are eligible for rush order delivery and will be delivered together within 2 hours.     - Which items (if any) are ineligible and will follow regular delivery.     - Delivery fees for rush order items (including an additional 10,000 VND per rush order item) and regular delivery items (if applicable), calculated based on weight and location. * The customer submits the rush order delivery information. * The system calculates total fees:   + Rush order delivery fees: Initial fee (e.g., 22,000 VND for the first 3kg in Hanoi) + 2,500 VND per additional 0.5kg + 10,000 VND per rush order item.   + Regular delivery fees (if applicable): Based on location and weight, with free shipping up to 25,000 VND for orders over 100,000 VND (excluding rush order items). * The system displays the updated invoice with separate delivery fees and total cost. * The customer confirms the order. * The system processes the order and provides a confirmation with delivery details.   Table N-Alternative flows of events for UC Place order   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Location** | **Condition** | **Action** | **Resume location** | | 1 | At Step 2 | If the delivery address is outside the inner city of Hanoi districts | - The system notifies the customer that rush order delivery is unavailable for their address.  - The system prompts the customer to update the delivery address or switch to regular delivery.  - If the customer updates the address and it becomes eligible, return to step 3.  - If the customer switches to regular delivery, the system proceeds with standard checkout. | Resumes at Step 3 | | 2 | At Step 3 | If no products in the cart are eligible for rush order delivery | - The system notifies the customer that none of their items qualify for rush order delivery.  - The system prompts the customer to adjust their cart (e.g., add eligible items) or switch to regular delivery  - If the customer adjusts the cart and adds eligible items, return to step3.  - If the customer switches to regular delivery, the system proceeds with standard checkout. | Resume at Step 3 | | 3 | At Step 7 | If the customer modifies the delivery method or items in the cart | - The system recalculates eligibility and fees based on the updated selections.  - The system redisplays the invoice with updated costs.  - Return to step 8 for confirmation. | Resume at Step 8 |  1. **Input data**   Table A-Input data of …   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Mandatory** | **Valid condition** | **Example** | |  | **Delivery Method** | Customer's choice of delivery method (rush order or regular delivery) | Yes | - "Rush Order": Address in inner Hanoi districts, at least one product eligible, time within 2 hours.  - "Regular": Always valid if rush order conditions fail or customer opts out. | "Rush Order" | | 2. | Delivery Address | Address where the customer wants the items delivered (including district, city details). | Yes | Must be within the inner city of Hanoi (districts only) for rush order; any valid address for regular delivery. | "97 Dai Co Viet Street, Bach Khoa, Hai Ba Trung, Hanoi" | | 3 | Cart Item List | List of items the customer wants to purchase, including quantity and product codes. | Yes | At least one item must be eligible for rush order if selected; otherwise, valid for regular delivery. | "Eggs (Qty: 12)  Keyboard (Qty: 1) | | 4 | Rush Order Delivery Time | Specific time within the next 2 hours when the customer wants rush delivery. | Yes (if rush order selected) | Must be within 2 hours from order placement (e.g., if placed at 12:00 PM, time must be 12:00–14:00 PM). | 12:00 PM – 14:00 PM | | 5 | Product Weight | Weight of each product in the cart (unit: kg). | Yes (system-provided) | Must be a positive value for fee calculation; heaviest item determines shipping fee per group. | Rice : 5kg  Meat : 1kg | | 6 | **Rush Order Eligibility** | Information determining if a product supports rush order delivery (yes/no). | Yes (system-provided) | "Yes" for at least one item if rush order is selected; "No" is valid for regular delivery items. | "Cake: Yes  Desk: No" | | 7 | **Delivery Instructions** | Additional instructions from the customer. | No | Any text or empty; must not conflict with delivery feasibility (e.g., accessible location). | “Leave at gate” | | 8 | **Order Value** | Total value of items in the cart. | Yes (system-provided) | Positive value; >100,000 VND qualifies for free regular shipping (up to 25,000 VND), excludes rush items. | 150.000 VND |  1. **Output data**   Table B-Output data of …   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No** | **Data fields** | **Description** | **Display format** | **Example** | |  | **Order Confirmation** | Confirmation message indicating the order has been successfully placed. | Text string | "Your order #12345 has been placed successfully." | |  | Rush Order Delivery Details | Details of the rush order items, including delivery time and location. | List: Item Name, Time, Address | "Cream Cake - Delivery at 14:00 PM, Feb 27, 2025 to 97 Dai Co Viet street, Bach Khoa, Hai Ba Trung, Hanoi" | |  | Regular Delivery Details | Details of items delivered via regular method (if any), including estimated delivery. | List: Item Name, Estimated Delivery | "Gaming Desk  Estimated delivery: Feb 28, 2025" | |  | Rush Order Delivery Fee | Fee calculated for rush order items, including base fee and surcharge. | Currency (VND) | "32,000 VND" (22,000 VND base + 10,000 VND surcharge) | |  | Regular Delivery Fee | Fee calculated for regular delivery items (if any), or free shipping note. | Currency (VND) or Text | "0 VND (Free shipping applied)" | |  | Total Order Cost | Total cost including item prices and all delivery fees. | Currency (VND) | "182,000 VND" | |  | Invoice Breakdown | Detailed breakdown of costs (items, rush fee, regular fee) for transparency. | Table: Category, Amount | "Items: 150,000 VND  Rush Fee: 32,000 VND  Regular Fee: 0 VND" |  1. **Postconditions:**  * The order is successfully placed with rush order delivery for eligible items (if applicable) and regular delivery for ineligible items (if any). * The customer receives a confirmation with delivery times and fees. * The system updates the order status and notifies relevant parties (e.g., delivery team). |

# Usability

*Requirements that relate to, or affect, the usability of the system. Examples include ease-of-use requirements or training requirements that specify how readily the system can be used by its actors.*

* **Ease of Use**:
* The system must provide a simple, intuitive desktop interface, allowing new users (customers, product managers, administrators) to familiarize themselves within 10 minutes without detailed instructions, with key functions (search, add product, checkout) accessible in no more than 2 clicks.
* Notifications (e.g., "Insufficient inventory quantity," "Invalid delivery address") must use clear, understandable language, accompanied by explicit action buttons (e.g., "Update cart," "Re-enter information") to guide users in quickly resolving issues.
* The order placement, product management, and user administration processes must follow a linear workflow with "Back" and "Next" buttons at each step, facilitating easy navigation.
* **Information Display**:
* Product lists (20 items per page) and pending order lists (30 orders per page) must be displayed in a table or grid format, with key columns (name, price, quantity, status) adjustable in width and supporting sorting (e.g., by price, warehouse entry date).
* Invoices, cart details, and product information must present data in a structured format (table or hierarchical list), separating product value, VAT, delivery fees, and total for transparency.
* **Input Simplification**:
* Input forms (e.g., product details, delivery information, user data) must offer auto-suggestions (e.g., province/city list) and real-time format validation (e.g., date DD/MM/YYYY, 10-digit phone number), minimizing manual entry errors.
* Product managers can only add/edit one product at a time, with mandatory fields (e.g., title, value, barcode) clearly marked with an asterisk (\*) and immediate alerts if data is missing before saving.
* **Accessibility**:
* The interface must use a minimum font size of 14px, a text contrast ratio of at least 4.5:1, and support keyboard shortcuts (e.g., Ctrl+S to save a product, Ctrl+D to delete) to enhance efficiency for desktop users.
* **Training Requirements**:
* Customers require no prior training; the system must include in-interface guidance via tooltips or a "Help" link for functions like product search, order placement, and cancellation.
* Product managers and administrators must be trained within 4 hours to proficiently perform tasks such as adding/editing/deleting products, managing users, and approving orders, with concise documentation (under 10 pages).
* **Language Support**:
* The system must default to Vietnamese, with standardized terms like "Add Product," "Checkout," "Cancel Order" to avoid confusion; English support must be available as an option for future expansion.

# Reliability

*Any requirements concerning the reliability of the system. Quantitative measures such as mean time between failure or defects per thousand lines of code should be stated.*

* **System Availability**:
* The system must operate continuously 24/7, maintaining functionality for at least 300 hours without critical failure (per AIMS requirements), ensuring customers can shop and product managers/administrators can perform tasks at all times.
* **Error Handling**:
* The system must detect and handle input errors (e.g., incorrect date format, product value outside 30%-150% range) with a failure rate below 0.5%, displaying specific error messages (e.g., "Price must be between 30% and 150% of original value") and allowing immediate correction.
* Inventory checks before order placement must be 99.9% accurate, automatically rejecting orders if stock is insufficient and notifying customers/product managers of the shortage quantity.
* **Mean Time Between Failures (MTBF)**:
* The MTBF must be at least 300 hours (per AIMS), ensuring system stability while serving up to 1,000 concurrent customers and handling management/administrative operations.
* **Recovery After Incidents**:
* Following an incident (e.g., server failure, VNPay disconnection), the system must resume normal operation within a maximum of 1 hour (per AIMS), preserving cart data, orders, and operation history without loss, and notifying affected users via email if necessary.
* **Data Integrity**:
* Product data (price, quantity, barcode) and order data (payment, delivery) must be synchronized between the interface and database with a discrepancy rate below 0.1%, preventing mismatches in displayed information.
* Operation history (add/edit/delete products, place/cancel orders) must be fully recorded with 100% reliability and stored for at least 6 months for auditing purposes.
* **Security Limits**:
* The system must enforce that product managers cannot delete/update more than 30 products daily, with an error rate for exceeding this limit below 0.01%, and immediately notify users if violated (e.g., "Limit of 30 products reached").

# Performance

*The performance characteristics of the system. Include specific response times. Reference related use cases by name.*

* **Response Time**:
* Displaying a list of 20 products (random or search results) must complete within 2 seconds under normal conditions or 5 seconds during peak hours (per AIMS).
* Adding/editing/deleting products by product managers must save to the database within 2 seconds (normal) or 5 seconds (peak).
* Calculating and displaying invoices (including product prices, VAT, delivery fees) must complete within 2 seconds (normal) or 5 seconds (peak).
* Sending order confirmation emails (post-payment) must complete within 3 seconds (normal) or 5 seconds (peak).
* **Throughput**:
* The system must handle up to 1,000 concurrent customers (per AIMS) without significant performance degradation (response time increase not exceeding 10%), supporting product searches, order placements, and payments.
* **Database Performance**:
* Data queries (products, inventory, user information) must complete within 1 second, even with a database containing 10,000 products or 5,000 orders, ensuring fast processing for all operations.
* **Order Processing**:
* Inventory checks before order placement must complete within 1 second, supporting up to 500 simultaneous orders during peak hours without delays.
* **Payment Integration**:
* Integration with VNPay for credit card payments must complete within 5 seconds (normal) or 10 seconds (peak), ensuring smooth transaction processing without interruptions.
* **Peak Load Management**:
* The system must maintain performance with a 50% increase in user volume (e.g., from 1,000 to 1,500 concurrent customers), with response time increases not exceeding 20%, validated under high-load testing conditions.