

**Requirement & Design Specification**

**Goods Exchange Application for students at FU**

1. **Introduction**

**1.1Purpose**

The purpose of this document is to provide a detailed description of the functionalities and features of the Goods Exchange Application for students at FU. This application is designed to facilitate the exchange and management of products and tools among students, enabling efficient transactions and interactions. The system caters to various user roles including guests, buyers, sellers, administrators, and moderators, each with specific access and functionalities to ensure a seamless and secure user experience.

**1.2 Document Conventions**

This document describes the online purchasing management system, user classification and main functions of each type.

**Visitors**: limited access, only view product catalog.

**Buyers**: search, filter products, purchase, interact with sellers (comments, reviews).

**Seller**: post products, manage posts, process orders, customer care.

**Administrator**: manage users, product categories, policies, reports.

**Moderator**: censors products, handles violations.

In addition, the document also presents the conventions used in the document (typography, lists, references, tables, languages, typography) to ensure consistency and ease of understanding.

**1.3 Project Scope and Product Features**

The web application is designed specifically to facilitate the exchange and trading of products among FPTU students. Its key features include:

* **Product Purchase and Chat**: Buyers can directly communicate with sellers through an integrated chat feature on the website. This allows for seamless discussions and negotiations. Once an agreement is reached, an invoice is generated directly on the platform to confirm the transaction.
* **Product Listing for Sale**: Users can easily list their products for sale. Each listing undergoes review and moderation by a dedicated team to ensure quality and compliance before it becomes publicly visible.
* **Manage Listed Products**: Sellers can track the approval status of their listed products, helping them manage their sales effectively and stay updated on their product’s status.
* **Purchase Additional Listing Slots**: To enhance product visibility and increase sales opportunities, sellers can buy additional listing slots. This feature helps maximize exposure and promotes better sales prospects.
* **User Reviews**: The platform allows buyers to rate sellers and vice versa. This rating system builds a transparent and trustworthy trading community, where users can make informed decisions based on the reviews of others.
* **Report Issues**: If users encounter any problems with listed products or suspect any rule violations, they can report the products. The moderation team will review and address these reports promptly to maintain the platform's integrity and reliability

**1.4 References**

 Student exchange platforms, e-commerce best practices, FU systems, regulations, and software development standards.

1. **Overall Description**

#### 2.1 Product Perspective

The Goods Exchange Application for students at FU is a web and mobile-based platform designed to facilitate the buying, selling, and exchanging of products and tools among students. This application serves as a virtual marketplace tailored specifically for the university community, providing a secure and user-friendly environment for transactions.

**2.2 User Classes and Characteristics**

|  |  |
| --- | --- |
| Guest | limited access to system features (mobile and web app). |
| Buyer | Person who uses the application to search, view information and buy products and tools from sellers. They can search for products by category or keyword, filter products. In addition, buyers can interact with the product by commenting, contacting the seller, rating and responding to transactions. |
| Seller | Is a person who uses the application to sell their products and goods. They can post product information, manage posts. Additionally, they can interact with customers, view their transaction history and status. |
| Administrator | A privileged user who can manage the entire system. |
| Moderator | Is the person who has the right to review the product, review violation reports from users, after successfully reviewing the violator will be banned. |

**2.3 Operating environment**

**Software Environment:**

* This refers to the software platform on which the application will run. Here are some options to consider:
  + **Mobile Operating System (OS):** Android, iOS (depending on whether you want a native app for each or a cross-platform solution).
  + **Web Application Framework:** There are many options depending on the desired features and development language. Some popular choices include: C# ,Node.js (JavaScript).
  + **Database:** This will store all the product information, user data, and transaction details. Popular choices include MySQL, PostgreSQL, MongoDB, depending on the data structure and scalability needs.

**2. Hardware Environment:**

* This refers to the minimum hardware specifications required to run the application smoothly. You'll need to consider:
  + **For Mobile App:** Minimum RAM, storage space, and operating system version supported by the target devices (phones/tablets).
  + **For Web App:** Server specifications like CPU cores, RAM, and storage capacity to handle the expected user load.

**2.4 Design and Implementation Constraints**

**Security:** The system must ensure the confidentiality, integrity, and availability of user and item data. Measures should be taken to protect against unauthorized access, data breaches, and other security threats.

**Scalability:** The system should be able to handle a growing number of users and items without performance degradation. It should be designed to support a large number of transactions and user interactions efficiently.

**Usability:** The user interface should be intuitive and easy to navigate for all user roles, including students who are listing items, browsing items, and making exchanges. The design should focus on a seamless user experience.

**Compliance:** The system must comply with relevant legal and regulatory requirements for data protection, including GDPR or equivalent local laws. It should also adhere to any university-specific policies regarding online transactions and student interactions.

**2.5 Assumptions and Dependencies**

- Users have access to the internet and own a device (computer, smartphone, or tablet) that supports modern web browsers or mobile applications.

- Users have basic computer literacy to navigate and use the web application.

-Users will adhere to the application’s terms of service and community guidelines.

- The provides accurate and up-to-date information for integration into the system.

**III. System Features**

### **3.1 Product Purchase and Chat**

#### 3.1.1 Description

The Product Purchase and Chat feature is designed to facilitate direct communication between buyers and sellers within the e-commerce platform. This integrated chat functionality enables users to discuss product details, negotiate prices, and clarify any queries in real-time, leading to a smoother and more efficient purchasing process.

Key aspects of this feature include:

**Direct Communication:** Buyers can initiate a conversation with sellers directly from the product page. This direct line of communication helps in obtaining immediate answers to questions about the product, shipping details, payment options, and more.

**Seamless Negotiations:** The chat functionality supports real-time negotiations, allowing buyers and sellers to agree on terms such as price, quantity, and shipping methods without leaving the platform.

**Invoice Generation:** Once an agreement is reached, the platform automatically generates an invoice summarizing the transaction details. This invoice serves as a formal confirmation of the agreement and includes product details, agreed price, payment terms, and shipping information.

**Transaction Tracking:** Both parties can track the status of their transaction through the platform, ensuring transparency and reducing the likelihood of disputes.

The integrated chat feature is designed to enhance the user experience by providing a convenient and efficient means of communication, ultimately leading to higher satisfaction and trust between buyers and sellers.

#### 3.1.2 Functional Requirements

**Chat Initiation and Management**

The system must provide a chat button on each product page, enabling buyers to start a conversation with the seller.

The chat interface should support text messaging, file sharing (e.g., images of the product), and message notifications.

Both buyers and sellers should have access to their chat history for each product and transaction.

**Real-Time Messaging**

The chat system must support real-time messaging with minimal latency to ensure seamless communication between buyers and sellers.

Messages should be securely transmitted and stored to maintain privacy and confidentiality.

**User Authentication and Verification**

Only registered users should be able to use the chat feature to prevent spam and ensure accountability.

The system must verify the identities of both buyers and sellers before allowing them to communicate.

**Negotiation and Agreement Mechanism**

The chat system must allow users to discuss and negotiate terms such as price, quantity, and shipping directly within the chat interface.

Once terms are agreed upon, users should be able to lock in these terms through the chat system, triggering the invoice generation process.

**Invoice Generation**

The system must generate an invoice automatically once a transaction agreement is reached.

The invoice should include all relevant details such as product description, price, quantity, buyer and seller information, and agreed-upon terms.

Users should be able to view, download, and print the invoice from their respective accounts.

**Transaction Confirmation and Tracking**

The system must confirm the transaction and update the status once the invoice is generated and agreed upon by both parties.

Both buyers and sellers should be able to track the progress of the transaction, including payment status and shipping updates.

**Security and Data Protection**

The chat system must encrypt messages and securely store user data to protect against unauthorized access and data breaches.

The system should comply with relevant data protection regulations to ensure the privacy of user information.

**User Interface and Usability**

The chat interface should be user-friendly and accessible, with clear navigation and intuitive controls.

The system must provide tooltips, help sections, or a user guide to assist users in utilizing the chat feature effectively.

**Error Handling and Support**

The system must provide mechanisms for handling errors such as connection issues or failed message delivery.

Users should have access to support or troubleshooting options in case they encounter problems with the chat feature.

**Integration with Other Platform Features**

The chat feature should integrate seamlessly with other platform functionalities, such as product listings, user profiles, and payment systems.

The system should allow for easy transition from chat negotiations to invoice generation and transaction processing.

### **3.2 Product Listing for Sale**

#### 3.2.1 Description

The Product Listing for Sale feature allows users to showcase and offer their products for sale on the e-commerce platform. Sellers can create detailed listings that include product descriptions, images, pricing, and other relevant information. Each listing undergoes a thorough review and moderation process by a dedicated team to uphold quality standards and ensure compliance with platform guidelines before becoming publicly visible.

Key aspects of this feature include:

**User-Friendly Listing Creation:** Sellers can easily create and manage their product listings through an intuitive interface. They can input essential details such as product title, description, specifications, pricing, availability, and shipping options.

**Quality Assurance:** Before a listing is published on the platform, it undergoes review and moderation by a dedicated team. This process verifies the accuracy of information, checks for compliance with platform policies, and ensures the quality of content and images provided.

**Moderation Criteria:** The moderation process includes checks for prohibited items, misleading information, inappropriate content, and adherence to legal and regulatory requirements. Listings that meet these criteria are approved for publication.

**Visibility Upon Approval:** Once approved, the product listing becomes publicly visible on the platform, making it accessible to potential buyers who can browse, search, and view details about the listed products.

**Editing and Updates:** Sellers have the flexibility to edit their listings after submission to update product information, adjust pricing, or make other necessary changes. Updated listings may undergo re-review if significant changes are made.

**Seller Support and Guidance:** The platform provides support and guidance to sellers throughout the listing creation and moderation process. Sellers receive notifications and feedback from the moderation team regarding the status of their listings.

#### 3.2.2 Functional Requirements

**Listing Creation Interface**

Provide a user-friendly interface for sellers to input product details including title, description, images, pricing, quantity, variations (if applicable), and shipping information.

Include options for sellers to upload high-quality images that accurately represent the product.

**Review and Moderation Process**

Implement a dedicated team or automated system to review each submitted listing.

Define clear criteria and guidelines for moderation, covering accuracy of information, compliance with platform policies, and quality of content.

**Moderation Workflow**

Notify sellers of the status of their listings (e.g., pending review, approved, rejected).

Provide feedback to sellers if a listing does not meet moderation criteria and suggest improvements or corrections.

**Compliance Checks**

Conduct checks to ensure listings do not contain prohibited items, misleading claims, or inappropriate content.

Verify compliance with legal and regulatory requirements, such as product safety standards and intellectual property rights.

**Approval and Publication**

Upon approval, make the listing publicly visible on the platform for browsing and search by potential buyers.

Include options for sellers to schedule the publication of listings if needed.

**Listing Updates**

Allow sellers to edit and update their listings post-submission.

Implement a process to re-review updated listings if significant changes are made.

**Seller Notifications**

Notify sellers via email or platform notifications about the status of their listings and any actions required (e.g., revisions, additional information).

**Support and Guidance**

Provide sellers with resources, guidelines, and support to assist in creating and optimizing their listings.

Offer help documentation, FAQs, or direct support channels for sellers facing challenges during the listing creation or moderation process.

**Integration with Platform Features**

Ensure seamless integration with other platform features, such as search functionality, user profiles, product categories, and payment systems.

Enable cross-linking between listings and related products or seller profiles to enhance visibility and user engagement.

**Reporting and Monitoring**

Implement tools for monitoring and reporting on the performance and compliance of listings over time.

Allow users to report inappropriate or inaccurate listings for further review and action by the moderation team.

This feature set aims to provide sellers with a reliable platform to list their products for sale while maintaining high standards of quality, accuracy, and compliance. By integrating robust review and moderation processes, the platform ensures a trustworthy marketplace environment for both sellers and buyers.

### **3.3 Manage Listed Products**

#### 3.3.1 Description

The Manage Listed Products feature empowers sellers on the e-commerce platform to monitor and manage the approval status and performance of their listed products. Sellers can track the progress of their product listings from submission to approval, ensuring effective management of their sales activities and keeping themselves informed about the status of their products on the platform.

Key aspects of this feature include:

**Visibility and Monitoring:** Sellers have visibility into the approval status of each of their listed products. They can track whether a listing is pending review, approved, or requires action (e.g., revisions).

**Centralized Dashboard:** A centralized dashboard provides sellers with an overview of all their listed products, including detailed information such as current status, views, inquiries, and sales metrics.

**Actionable Insights:** Sellers can gather actionable insights from performance metrics associated with their listings, such as views, click-through rates, and conversion rates. This information helps sellers optimize their product listings to enhance visibility and sales.

**Update and Management Tools:** Sellers can make updates to their product listings directly from the management interface. This includes editing product details, adjusting pricing, updating inventory levels, or making revisions based on feedback.

**Communication and Notifications:** The platform notifies sellers of changes in the status of their listings (e.g., approval, rejection) and provides alerts for actions needed (e.g., additional information required, updates to listing content).

#### 3.3.2 Functional Requirements

**Listing Status Overview**

Provide a dashboard or summary view where sellers can see the approval status of all their listed products.

Display status indicators (e.g., pending review, approved, rejected) for each listing.

**Detailed Listing Information**

Allow sellers to access detailed information for each listing, including product description, images, pricing, and current status.

Enable quick access to edit and update listing details directly from the management interface.

**Performance Metrics**

Track and display performance metrics for each listing, such as views, inquiries, click-through rates, and conversion rates.

Provide comparative data or benchmarks to help sellers gauge the effectiveness of their listings.

**Actionable Insights**

Offer insights or recommendations based on performance metrics to help sellers optimize their listings and improve sales performance.

Provide guidance on best practices for product presentation, pricing strategies, and promotional opportunities.

**Listing Management Tools**

Implement tools for sellers to edit, update, or remove listings as needed.

Enable bulk management options for sellers with multiple listings, such as batch updates or bulk edits.

**Communication and Notifications**

Notify sellers via platform notifications or email regarding changes in the status of their listings (e.g., approval, rejection, updates required).

Provide alerts for actions needed, such as responding to inquiries or updating product information.

**Revision and Resubmission**

Allow sellers to revise listings based on feedback or changes in product details.

Facilitate the resubmission of revised listings for re-evaluation and approval.

**Security and Access Control**

Ensure that only authorized sellers have access to manage their listed products.

Implement authentication and authorization mechanisms to protect seller accounts and data.

**User Interface and Usability**

Design an intuitive and user-friendly interface for managing listed products, with clear navigation and accessible controls.

Provide tooltips, help sections, or user guides to assist sellers in navigating and utilizing management features effectively.

**Integration with Platform Features**

Ensure seamless integration with other platform functionalities, such as product listing creation, transaction management, and customer support.

Enable cross-linking between management tools and performance analytics to provide holistic insights into sales activities.

By implementing these functional requirements, the Manage Listed Products feature enhances the experience for sellers by providing transparency, actionable insights, and efficient tools for optimizing their product listings and maximizing sales potential on the e-commerce platform.

### **3.4 Purchase Additional Listing Slots**

#### 3.4.1 Description

The Purchase Additional Listing Slots feature provides sellers on the e-commerce platform with the opportunity to enhance their product visibility and increase their sales potential by purchasing extra slots for product listings. This functionality allows sellers to showcase more products simultaneously, thereby maximizing their exposure to potential buyers and promoting better sales prospects.

Key aspects of this feature include:

**Increased Visibility:** By purchasing additional listing slots, sellers can display more products on the platform, increasing the likelihood of their products being discovered by potential buyers.

**Flexible Plans:** The platform offers various plans and pricing options for additional listing slots, catering to the diverse needs of sellers ranging from small businesses to larger enterprises.

**Easy Purchase Process:** The process of purchasing additional listing slots is straightforward, with options for one-time purchases or subscription-based plans. Sellers can choose the plan that best fits their sales strategy and budget.

**Enhanced Sales Opportunities:** More listing slots allow sellers to capitalize on different product categories, seasonal trends, and promotional opportunities, thereby enhancing their overall sales prospects.

**Management and Tracking:** Sellers can manage and track their listing slots through a dedicated interface, ensuring they can effectively utilize their purchased slots and monitor their impact on sales and visibility.

#### 3.4.2 Functional Requirements

**Listing Slot Purchase Options**

Provide sellers with a variety of plans for purchasing additional listing slots, including one-time purchase options and subscription-based plans.

Clearly display the pricing, terms, and benefits associated with each plan.

**Purchase Interface**

Implement an easy-to-use interface for sellers to select and purchase additional listing slots.

Allow sellers to view their current plan, remaining slots, and purchase history within this interface.

**Payment Processing**

Integrate secure payment options to facilitate the purchase of additional listing slots, including credit/debit cards, online payment gateways, and other accepted methods.

Provide an option for sellers to save their payment details for future purchases, ensuring security and compliance with data protection regulations.

**Confirmation and Notifications**

Send confirmation notifications to sellers once the purchase of additional listing slots is successful.

Provide details of the purchased slots, including the total number, expiry date (if applicable), and any terms or conditions associated with the purchase.

**Slot Management**

Allow sellers to view and manage their purchased listing slots through a dedicated management dashboard.

Enable sellers to allocate slots to different product categories or specific products as per their sales strategy.

**Usage Tracking**

Track the usage of listing slots, providing sellers with insights into how many slots are used, available, and set to expire.

Offer visual aids such as charts or progress bars to help sellers monitor their slot utilization effectively.

**Renewal and Expiry Alerts**

Notify sellers of upcoming renewals or expiration of their listing slots to ensure continuity in product visibility.

Provide options for auto-renewal or manual renewal of slots based on seller preference.

**Upgrade and Downgrade Options**

Allow sellers to upgrade or downgrade their slot plans easily, accommodating changes in their product listing needs.

Implement a flexible system for prorated billing or refunds in cases of plan changes.

**Integration with Listing Features**

Ensure that the purchased slots integrate seamlessly with the existing product listing features on the platform.

Allow for easy allocation of new slots to existing products or the creation of new product listings using the additional slots.

**Support and Guidance**

Provide support and guidance for sellers on purchasing and managing additional listing slots, including FAQs, help documentation, and customer support channels.

Offer tips and best practices for maximizing the effectiveness of additional listing slots to boost sales and visibility.

**Analytics and Reporting**

Offer analytics and reporting tools to help sellers assess the impact of their additional listing slots on product visibility and sales performance.

Provide detailed reports that highlight key metrics such as increased traffic, product views, and sales conversions attributed to the additional slots.

**Security and Compliance**

Ensure that the purchase and management of listing slots adhere to secure practices, including encrypted transactions and compliance with data protection laws.

Implement authentication and authorization measures to protect seller accounts and prevent unauthorized access.

By incorporating these functional requirements, the Purchase Additional Listing Slots feature enhances the capabilities of sellers to effectively increase their product visibility on the platform, providing them with a competitive edge and more significant opportunities for sales growth.

**IV.Use Cases**

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**4.1 Use Cases for Guest**

**1. Browse Products Description:** A guest can browse the product categories and see available listings without registering or logging in.

* **Steps:**
  1. The guest accesses the online shopping system (mobile app or website).
  2. The system displays the main categories of products.exclamation
  3. The guest can navigate through the categories and subcategories to see specific products.
  4. The system displays a list of products with basic information like image, title, and price.
  5. (Optional) The guest can view a filtered list of products based on criteria like price range or brand (if available for guests).
* **Success:** The guest can see a variety of products offered on the platform.

**2. View Product Details**

* **Description:** A guest can view detailed information about a specific product without registering.
* **Steps:**
  1. The guest navigates to the product page of a particular item.
  2. The system displays detailed information about the product, including:
     + Description
     + Images
     + Specifications
     + Reviews (if available publicly)
  3. (Optional) The guest can see additional information like variations, sizes, or colors (if applicable).
* **Success:** The guest gains a thorough understanding of the product's features and offerings.

**4.2 Use Cases for Buyer**

**1. Search for Products (Tìm kiếm Sản phẩm)**

* **Description:** The buyer can search for specific products by keyword or filter them based on various criteria.
* **Steps:**
  1. The buyer accesses the online shopping system.
  2. The buyer enters a keyword or phrase in the search bar.
  3. (Optional) The buyer refines the search using filters like category, brand, price range, or other available options.
  4. The system displays a list of products matching the search criteria.
* **Success:** The buyer finds a list of relevant products based on their search query.

**2. View Product Details (Xem Chi Tiết Sản Phẩm)**

* **Description:** Similar to the guest use case, the buyer can view detailed information about a product.
* **Steps:**
  1. The buyer navigates to the product page of a particular item.
  2. The system displays detailed information about the product, including:
     + Description
     + Images
     + Specifications
     + Reviews from other buyers
     + Seller information (optional)
  3. (Optional) The buyer can see additional information like variations, sizes, or colors (if applicable).
* **Success:** The buyer gains a thorough understanding of the product's features and offerings.

**3. Add Product to Cart (Thêm Sản Phẩm vào Giỏ Hàng)**

* **Description:** The buyer can add products they intend to purchase to their shopping cart.
* **Steps:**
  1. The buyer navigates to the product page of a desired item.
  2. The buyer selects the desired quantity (if applicable).
  3. The buyer clicks the "Add to Cart" button.
  4. The system adds the product to the buyer's shopping cart and displays a confirmation message.
* **Success:** The chosen product is added to the buyer's cart for future checkout.

**4. View and Manage Cart (Xem và Quản lý Giỏ Hàng)**

* **Description:** The buyer can view the contents of their shopping cart, modify quantities, or remove unwanted items.
* **Steps:**
  1. The buyer accesses their shopping cart.
  2. The system displays a list of products added to the cart, including:
     + Product image
     + Product name
     + Quantity
     + Unit price
     + Total price (quantity x unit price)
  3. The buyer can edit the quantity of each item.
  4. The buyer can remove unwanted items from the cart.
* **Success:** The buyer can review and modify the items in their cart before proceeding to checkout.

**5. Checkout and Purchase (Thanh Toán và Mua Hàng)**

* **Description:** The buyer completes the purchase process by providing their shipping information, choosing a payment method, and confirming the order.
* **Steps:**
  1. The buyer proceeds to checkout from their shopping cart.
  2. The buyer enters their shipping information (name, address, phone number).
  3. The buyer selects a preferred shipping method (if available).
  4. The buyer chooses a payment method (credit card, debit card, e-wallet, etc.).
  5. The buyer reviews the order summary (items, quantities, prices, shipping cost, total amount).
  6. The buyer confirms the order by placing the final order.
  7. The system processes the payment and creates a confirmed order.
* **Success:** The buyer successfully completes the purchase, and the seller receives the order details.

**6. Track Order Status (Theo Dõi Trạng Thái Đơn Hàng)**

* **Description:** The buyer can track the progress of their order after purchase.
* **Steps:**
  1. The buyer accesses their order history.
  2. The buyer selects a specific order.
  3. The system displays the current status of the order (processing, shipped, delivered, etc.).
  4. (Optional) The buyer can see additional information like tracking details (if available).
* **Success:** The buyer gains visibility into the delivery timeline of their purchase.

**7. Rate and Review Products (Đánh Giá Sản Phẩm)**

* **Description:** The buyer can leave a review and rating for products they have purchased.
* **Steps:**
  1. The buyer accesses their order history.
  2. The buyer selects a specific completed order.
  3. The system displays an option to rate and review the product(s).
  4. The buyer provides a star rating and writes a review about their experience with the product.
  5. The buyer submits the review.
* **Success:** The buyer shares their feedback on the product, which can be helpful for other buyers.

**4.3 Use Cases for Seller**

**1. Create Seller Account (Tạo Tài Khoản Người Bán)**

* **Description:** The seller registers on the platform to create an account for selling their products.
* **Steps:**
  1. The seller accesses the seller registration page.
  2. The seller provides their personal information (name, email, phone number).
  3. The seller creates a username and password for their account.
  4. (Optional) The seller enters additional information like business details or store name.
  5. The seller submits the registration form.
* **Success:** The seller has a registered account and can start listing products for sale.

**2. Manage Products (Quản lý Sản phẩm)**

* **Description:** The seller can add, edit, or remove product listings from their store.
* **Steps:**
  1. The seller accesses their seller dashboard.
  2. The seller selects the "Products" section.
  3. To add a new product:
     + The seller clicks the "Add Product" button.
     + The seller enters product details like name, description, category, brand (if applicable).
     + The seller uploads product images.
     + The seller sets the selling price and quantity available.
     + (Optional) The seller adds variations, sizes, or colors (if applicable).
     + The seller submits the product information.
  4. To edit an existing product:
     + The seller selects the product they want to modify.
     + The seller can edit any product details mentioned in step 3a.
     + The seller submits the changes.
  5. To remove a product:
     + The seller selects the product they want to delete.
     + The seller confirms the deletion.
* **Success:** The seller can create and maintain an accurate product catalog for their store.

**3. Process Orders (Xử lý Đơn Hàng)**

* **Description:** The seller manages the order fulfillment process for purchases made by buyers.
* **Steps:**
  1. The seller receives notifications for new orders.
  2. The seller reviews the order details (items, quantities, buyer information).
  3. The seller confirms the order and initiates fulfillment.
  4. The seller prepares the order for shipment (packing, labeling).
  5. (Optional) The seller enters shipping information and generates a shipping label (if integrated with a shipping service).
  6. The seller arranges for shipment of the order through a chosen carrier or method.
  7. The seller marks the order as "shipped" within the system.
  8. (Optional) The seller can communicate with the buyer regarding order status or any issues.
* **Success:** The seller fulfills the buyer's order and ensures timely delivery.

**4. Manage Inventory (Quản lý Kho Hàng)**

* **Description:** The seller can track their product stock levels and update them as needed.
* **Steps:**
  1. The seller accesses their inventory management section.
  2. The system displays a list of products with their current stock quantities.
  3. The seller can identify products running low on stock.
  4. The seller can update stock levels manually or set automatic notifications for low stock.
* **Success:** The seller maintains accurate inventory control to avoid stockouts and fulfill orders efficiently.

**5. View Sales Reports (Xem Báo cáo Doanh thu)**

* **Description:** The seller can access reports and data about their sales performance.
* **Steps:**
  1. The seller accesses the "Reports" section of their dashboard.
  2. The system displays reports on various metrics like:
     + Total sales
     + Sales by product
     + Order history
     + Customer demographics (if available)
  3. The seller can filter reports by date range or other criteria (if applicable).
* **Success:** The seller gains insights into their sales performance and can make informed business decisions.

**6. Communicate with Buyers (Trao đổi với Người mua)**

* **Description:** The seller can respond to buyer inquiries, address issues, and provide customer support.
* **Steps:**
  1. The seller receives messages or inquiries from buyers through the platform.
  2. The seller reads the message and understands the buyer's concern.
  3. The seller can respond to the buyer's message directly within the system.
  4. The seller can resolve any issues related to orders, products, or customer service.
* **Success:** The seller maintains clear communication with buyers to ensure a positive customer experience.

**4.4 Use cases for Moderator**

**1. Content Moderation (Kiểm duyệt Nội dung)**

* **Description:** Moderators review product listings, user-generated content (reviews, comments), and messages for adherence to platform guidelines.
* **Steps:**
  + Access a queue of new or flagged product listings, reviews, comments, or messages.
  + Review the content for violations of platform policies, such as:
    - Hate speech, offensive language, or discriminatory content.
    - Spam, irrelevant promotions, or misleading information.
    - Copyright infringement or unauthorized use of intellectual property.
    - Product listings for prohibited or illegal items.
  + Approve content that complies with the guidelines.
  + Remove or edit content that violates platform policies.
  + In some cases, issue warnings or temporary suspensions to users who repeatedly violate the rules.

**2. User Dispute Resolution (Giải quyết Tranh chấp Người dùng)**

* **Description:** Moderators intervene in disputes between buyers and sellers to find fair resolutions.
* **Steps:**
  + Review complaints or reports submitted by buyers or sellers regarding order issues, product quality, or customer service.
  + Investigate the issue by gathering information from both parties (buyer and seller).
  + Mediate communication between buyer and seller to facilitate a mutually agreeable solution (e.g., refunds, product replacements, etc.).
  + If a solution cannot be reached, make a final decision based on platform policies and available evidence.
  + In severe cases, take disciplinary action against users who engage in fraudulent activity or persistently violate platform rules (e.g., account suspension or ban).

**3. User Account Management (Quản lý Tài khoản Người dùng)**

* **Description:** Moderators may have limited access to manage user accounts in specific situations.
* **Steps:**
  + Investigate reports of suspicious user activity or potential security breaches.
  + Temporarily suspend user accounts if there's a risk of fraudulent activity or policy violations requiring further investigation.
  + Reset user passwords upon request or in cases of suspected account compromise.
  + Collaborate with Admins for more serious account management actions, such as permanent account bans.

**4. Platform Monitoring (Giám sát Hệ thống)**

* **Description:** Moderators may monitor the platform for emerging issues or trends that require intervention.
* **Steps:**
  + Monitor user activity and identify potential areas of concern, such as a sudden surge in spam content or negative customer reviews about a particular seller.
  + Analyze user behavior patterns to detect suspicious activity or attempts to exploit platform loopholes.
  + Report any identified issues or trends to Admins for further investigation or potential policy adjustments.

**5. User Education (Giáo dục Người dùng)**

* **Description:** Moderators can play a role in educating users about platform policies and responsible online behavior.
* **Steps:**
  + Develop and maintain clear and concise guidelines for product listings, reviews, and user interactions.
  + Respond to user inquiries and provide clarifications regarding platform rules.
  + In collaboration with Admins, create educational resources or FAQs to promote user awareness of platform expectations and responsible online conduct.

**4.5 Use cases for Admin**

**1. User Management (Quản lý Người dùng)**

* **Description:** Admins can manage user accounts (buyers, sellers) within the system.
* **Steps:**
  + Access the "User Management" section of the admin dashboard.
  + View a list of all registered users with details like username, email, account type (buyer/seller), and registration date.
  + Search for specific users by username or email address.
  + Edit user information (optional, depending on the system).
  + Suspend or deactivate user accounts for violating platform policies or security concerns.

**2. Product Management (Quản lý Sản phẩm)**

* **Description:** Admins can oversee product listings and potentially manage specific product categories.
* **Steps:**
  + Access the "Product Management" section of the dashboard.
  + View a list of all products or filter by category (if applicable).
  + Search for specific products by name or keyword.
  + Review product information and details submitted by sellers.
  + Approve or reject product listings based on adherence to platform guidelines (e.g., content restrictions, prohibited items).
  + Manage product categories (create, edit, delete) to organize product listings effectively (if applicable).

**3. Order Management (Quản lý Đơn hàng)**

* **Description:** Admins can monitor and manage order statuses within the system.
* **Steps:**
  + Access the "Order Management" section of the dashboard.
  + View a list of all orders with details like buyer information, seller information, order items, total amount, and current order status (placed, processing, shipped, delivered, cancelled, etc.).
  + Search for specific orders by order ID, buyer name, or product details.
  + Track the progress of individual orders.
  + Intervene in case of order issues or disputes between buyers and sellers (acting as a mediator, if needed).

**4. Content Management (Quản lý Nội dung)**

* **Description:** Admins can manage static content displayed on the platform.
* **Steps:**
  + Access the "Content Management" section of the dashboard.
  + Edit website content like FAQs, privacy policy, terms and conditions, or promotional messages.
  + Manage website banners, sliders, or other visual elements displayed on the homepage or key pages.

**5. System Configuration (Cấu hình Hệ thống)**

* **Description:** Admins can configure various system settings and functionalities.
* **Steps:**
  + Access the "System Configuration" section of the dashboard.
  + Manage user roles and permissions for different user types (admin, seller, buyer).
  + Configure payment gateway settings and integrations.
  + Set up shipping options and costs (if applicable).
  + Manage system notifications and alerts sent to users or admins.
  + Back up and restore system data to ensure data security.

**6. Reporting and Analytics (Báo cáo và Phân tích)**

* **Description:** Admins can generate reports and analyze platform usage data.
* **Steps:**
  + Access the "Reporting and Analytics" section of the dashboard.
  + View reports on various metrics like:
    - Total users (buyers and sellers)
    - Number of product listings
    - Sales volume and revenue
    - User activity and buying trends
  + Filter reports by date range or other criteria.
  + Leverage data insights to improve platform features and user experience.

**7. Security Management (Quản lý Bảo mật)**

* **Description:** Admins can manage platform security measures and user access control.
* **Steps:**
  + Implement user authentication protocols and enforce strong password policies.
  + Monitor system activity for suspicious behavior or potential security breaches.
  + Manage user access levels and restrict unauthorized access to sensitive data.
  + Stay updated on security best practices and implement necessary security measures to protect user data and platform integrity.

**V. Business Rules**

**General Rules:**

* All users must agree to the platform's terms and conditions before using the service.
* Product descriptions, images, and prices must be accurate and up-to-date.
* All transactions must comply with relevant laws and regulations (e.g., consumer protection, taxation).

**Buyer Rules:**

* Users must be at least 18 years old to register and purchase items.
* Buyers must provide accurate shipping information during checkout.
* Payment methods must be valid and authorized for the purchase amount.
* Orders are subject to availability and seller confirmation.

**Seller Rules:**

* Sellers are responsible for maintaining accurate product information and inventory levels.
* Sellers must comply with shipping timelines and policies as specified on the platform.
* Orders can be cancelled by the seller due to stock issues or other unforeseen circumstances, with notification to the buyer and a full refund.
* Sellers are responsible for addressing customer inquiries and resolving any product or service-related complaints.

**Product Listing Rules:**

* Products listed for sale must be legal and not violate any copyright or intellectual property rights.
* Certain hazardous or restricted items may be prohibited from being sold on the platform.
* Product descriptions should be clear and not misleading, accurately reflecting the product's features and condition.
* Competitive pricing strategies might be implemented to ensure fair pricing for buyers.

**Order Fulfillment Rules:**

* Orders are fulfilled based on a confirmed payment and seller acceptance.
* Shipping costs are calculated based on weight, dimensions, and destination.
* Order fulfillment timelines may vary depending on the seller's location and chosen shipping method.
* Order tracking information should be provided to the buyer upon shipment.

**Return and Refund Rules:**

* A return and refund policy should be clearly outlined for buyers, specifying the timeframe for returns, acceptable conditions for returned products, and any restocking fees.
* Refund processing timelines may vary depending on the payment method used.

### **VI. External Interface Requirements**

#### 6.1 Guest User Interfaces

The User Interfaces (UI) of the Goods Exchange Application for students at FU are designed to ensure ease of use, accessibility, and efficiency for all user roles. The UI must be intuitive and user-friendly, catering to the needs of guests, buyers, sellers, administrators, and moderators.

**Home Page:**

* Display a welcoming message and overview of the platform.
* Showcase featured products and categories.
* Provide navigation options to browse product categories.

**Product Catalog:**

* Show a grid or list view of products with images, titles, prices, and brief descriptions.
* Allow sorting by price, popularity, and new arrivals.
* Include a search bar for keyword searches.

**Product Details Page:**

* Display detailed information about the selected product, including images, descriptions, specifications, and reviews.
* Include a "View More" button for additional product images and information.

##### 6.2 Buyer User Interface

**Buyer Dashboard:**

* Provide an overview of the buyer's activity, including recent purchases, messages, and recommended products.
* Display notifications for order updates, messages, and important announcements.

**Product Search and Filter:**

* Offer advanced search options with filters for category, price range, brand, and other criteria.
* Show search results with the option to switch between grid and list views.

**Shopping Cart:**

* Display products added to the cart with images, names, prices, quantities, and total cost.
* Allow buyers to modify quantities or remove items.

**Order History:**

* Show a list of past orders with details such as order ID, date, status, and total amount.
* Allow buyers to view detailed order information, including product details, shipping status, and invoice.

**Product Review and Rating:**

* Provide a form for buyers to rate and review purchased products.
* Display a star rating system and a text area for comments.

##### 6.3 Seller User Interface

**Seller Dashboard:**

* Provide an overview of the seller's activity, including listed products, sales statistics, and recent orders.
* Display notifications for new orders, messages, and important updates.

**Product Listing Management:**

* Offer tools for sellers to create, edit, and manage their product listings.
* Include fields for product title, description, images, category, price, and quantity.
* Show the status of each listing (e.g., pending review, approved, rejected).

**Order Management:**

* Display a list of received orders with details such as order ID, buyer information, products, quantities, and total amount.
* Allow sellers to update order status (e.g., processing, shipped, delivered).

**Chat Interface:**

* Enable sellers to communicate with buyers through an integrated chat feature.
* Display chat history and notifications for new messages.

##### 6.4 Administrator User Interface

**Admin Dashboard:**

* Provide an overview of the platform's activity, including user statistics, sales reports, and system notifications.
* Display quick access links to manage users, products, categories, and reports.

**User Management:**

* Show a list of all users with details such as username, role, status, and registration date.
* Include options to add, edit, or deactivate users.
* Provide tools to manage user roles and permissions.

**Product and Category Management:**

* Display a list of all products with details such as title, seller, status, and category.
* Allow administrators to add, edit, or delete products and categories.
* Implement search and filter options to manage products efficiently.

##### 6.5 Moderator User Interface

**Moderator Dashboard:**

* Provide an overview of the moderation activity, including pending reviews, reported issues, and recent actions.
* Display notifications for new reports and important updates.

**Product Moderation:**

* Show a list of products pending review with details such as title, description, images, and seller information.
* Allow moderators to approve, reject, or request changes to product listings.
* Provide tools to add comments or notes for feedback to sellers.

**Issue Management:**

* Display a list of reported issues with details such as product, reporter, issue type, and status.
* Allow moderators to investigate and take actions such as resolving, escalating, or dismissing reports.

**User Violation Handling:**

* Show a list of users with reported violations along with details such as violation type, date, and status.
* Allow moderators to review violation reports, communicate with users, and apply sanctions if necessary.

**VII. Quality Attributes**

**7.1 Usability Requirements**

- Intuitive Design: The user interface should be easy to navigate with clear

instructions and feedback.

- Accessibility: The system should be accessible to users with disabilities

- Responsive Design: The interface should be responsive and function well on

various devices, including desktops, tablets, and smartphones.

**7.2 Performance Requirements**

- Response Time: The system should have a response time of less than 2

seconds for most operations.

- Scalability: The system should handle up to 10,000 concurrent users without performance degradation.

- Throughput: The system should support at least 1,000 transactions per

second during peak usage times.

**7.3 Security Requirements**

- Data Encryption: All sensitive data, including user information and payment

details, should be encrypted both in transit and at rest.

- Authentication and Authorization: Secure login mechanisms and

role-based access control to ensure only authorized users can access specific

functionalities.

- Data Protection: Compliance with data protection regulations such as GDPR

or relevant local laws.

**7.4 Safety Requirements**

- Data Backup: Regular backups of the database to prevent data loss in case

of system failure.

- Error Handling: Robust error handling to prevent system crashes and ensure

graceful recovery from unexpected issues.

**7.5 Availability Requirements**

- Uptime: The system should have an uptime of 99.9%, ensuring high

availability for users.

- Redundancy: Implementation of redundant systems and fail over mechanisms to maintain service continuity in case of hardware or software

failures.

**7.6 Robustness Requirements**

- Fault Tolerance: The system should continue to operate correctly even in the

presence of hardware failures, software bugs, or invalid user input.

- Recovery: The system should be able to recover quickly from failures and

restore normal operations with minimal data loss.

- Stress Testing: The system should undergo stress testing to ensure it can

handle extreme load conditions without compromising functionalist

**Main Flow:**

**A diagram of a workflow

Description automatically generated**



