BỘ THÔNG TIN VÀ TRUYỀN THÔNG

HỌC VIỆN CÔNG NGHỆ BƯU CHÍNH VIỄN THÔNG

Proposal Report

Foundation Internship

Project Title: Smart Shop AI Assistant

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Proposal: Smart Shop AI Assistant

I. Project Overview

Reason for Choosing the Topic

E-commerce is rapidly growing, particularly with the demand for Apple products such as iPhone, iPad, MacBook, Mac Mini, cases, Apple Watch, etc. Customers often face challenges in selecting suitable products due to the variety of models and configurations. Integrating artificial intelligence (AI) into an e-commerce website enhances user experience, optimizes the sales process, and provides effective customer support. The Smart Shop AI Assistant is designed to deliver an intelligent, convenient, and modern shopping platform.

Objectives

- **Specialized E-commerce Platform**: Build a website for selling Apple products with a user-friendly interface and integrated smart features.
- **Automated Customer Support**: Utilize an AI chatbot powered by the Gemini API and SQL database to recommend suitable products.
- **Automated Payment Processing**: Integrate VietQR for generating payment QR codes and use the MBBank library to automatically verify transactions.
- **Email Notifications**: Use SMTP to send automated emails for order confirmation, payment verification, and promotional announcements.
- **Efficient Admin Management**: Provide an admin interface to monitor user information, revenue, and manage product addition/editing/deletion.
- **Scalable and Stable System**: Develop a flexible architecture that can scale as the user base grows.

II. System Features

1. Features for Users

- **Registration, Login, and Account Management**
  - Register an account using email and password.
  - Log in and update personal information (name, address, phone number, profile picture).
  - View order history and delivery status.
- **Product Browsing and Purchasing**
  - Browse Apple products by category (iPhone, iPad, MacBook, Mac Mini, cases, Apple Watch, etc.).
  - Search products by name, category, or price.

- View product details: description, specifications, price, images.
- Add products to the cart, edit quantities, or remove items from the cart.
- **Payment**
  - Generate a payment QR code via VietQR for each order.
  - Receive payment confirmation emails (via SMTP) after the system verifies transactions through the MBBank API.
- **Product Consultation via Chatbot**
  - AI chatbot powered by Gemini API and SQL Connector to access product data.
  - Recommend products based on user needs (e.g., selecting an iPhone within budget or a MacBook for design work).
  - Answer questions about products, warranty policies, and shipping.
- **Rating and Feedback**
  - Rate products (stars, comments).
  - Submit feedback or support requests via a contact form.

2. Features for Administrators

- **User Management**
  - View the list of users.
  - Check the purchase history of individual users.
- **Product Management**
  - Add new products (name, category, price, description, specifications, images).
  - Edit product information.
  - Delete products no longer in stock.
- **Revenue Management**
  - View revenue reports by day, week, or month.
  - Track order statuses (pending payment, paid, shipping, completed).
- **Content Management**
  - Moderate user ratings and comments.
  - Update store policies.

3. AI Chatbot Features

- Retrieve data from the database to answer product-related questions.
- Recommend products based on user preferences (e.g., iPhone under 20 million VND, MacBook for programming).
- Provide information on products, warranty, and shipping.

III. Technologies Used

- **Pure PHP**
  - Develop backend and frontend logic for the website.

- - Handle registration, login, product management, cart, and user interface.
    - Create dynamique pages to display product lists, product details, and admin interface.
  - **MySQL**
    - Store user data, products, orders, transactions, and chatbot conversation history.
  - **VietQR**
    - Integrate VietQR API to generate payment QR codes for each order.
    - Display QR codes on the payment page.
  - **FastAPI and Flask**
    - Build APIs for:
      - Product management (add, edit, delete, retrieve lists).
      - Order processing (create, update status).
      - AI chatbot integration (send consultation requests, receive responses).
  - **SMTP**
    - Send automated emails for:
      - Customer feedback to the store.
      - Order and payment confirmations.
  - **MBBank API**
    - Integrate MBBank library to retrieve transaction history.
    - Verify payment status and update orders automatically.
  - **Gemini API and MySQL Connector**
    - Gemini API for natural language processing in the chatbot.
    - MySQL Connector to query product data for chatbot responses.

IV. Project Implementation Plan

Weeks 1−2 (May 1−14): Analysis & UML Design

- **UML Design**
  - Create UML diagrams: Use Case Diagram, Class Diagram, Sequence Diagram, Activity Diagram.
  - Describe key workflows: registration/login, purchasing, payment, chatbot consultation, product management.
- **Database Design**
  - Design the database structure to store user, product, order, transaction, and chatbot conversation data.

Weeks 3−4: Frontend Development (Pure PHP)

- **Set Up Frontend Project**
  - Configure the PHP project folder structure.

- Create PHP files for pages: homepage, product list, product details, cart, checkout, admin panel.
- **Build User Interface**
  - Homepage: Display featured products and product categories.
  - Product page: Show product details, reviews, and add-to-cart button.
  - Cart page: Manage cart items and calculate total price.
  - Registration page: User registration form.
  - Login page: User login form.
  - Virtual Assistant page: Display an AI assistant for user consultations.
- **Test Interface**
  - Test UI/UX on desktop and mobile devices.
  - Ensure pages render correctly and interactions are smooth.

Weeks 5–6: Backend Development (PHP, FastAPI, Flask, MySQL)

- **Set Up Backend Project**
  - Install PHP, MySQL, FastAPI, and Flask environments.
  - Connect PHP and FastAPI/Flask to the database.
- **Build APIs**
  - Chatbot API: Send consultation requests and receive responses from Gemini.
- **Integrate VietQR and MBBank**
  - Generate payment QR codes for orders.
  - Check transaction history via MBBank API.
- **Configure SMTP**
  - Set up automated email sending for order confirmations, payments, and notifications.
- **Integrate APIs with Frontend**
  - Use cURL in PHP to call APIs from FastAPI/Flask.
  - Display product, order, and chatbot consultation data.

Weeks 7–8: Finalization, Testing & Deployment

- **Enhance Advanced Features**
  - Optimize chatbot: Improve responses and store conversation history.
  - Add periodic promotional email functionality.
  - Enhance admin interface: Add revenue charts and product filtering.
- **Comprehensive Testing**
  - Test functionalities: registration, purchasing, payment, chatbot consultation.
  - Test performance: Page load speed and transaction processing.
  - Test security: API protection and user authentication.
- **Deployment**
  - Deploy the website to a server (Apache/Nginx).

- ○ Verify functionality in a live environment.
- **Documentation and Summary**
  - ○ Write user and admin manuals.
  - ○ Plan for maintenance and future feature updates (e.g., AI product recommendations).