

BỘ THÔNG TIN VÀ TRUYỀN THÔNG
HỌC VIỆN CÔNG NGHỆ BƯU CHÍNH VIỄN THÔNG



Fourth Report
Foundation Internship
ChippyCash
Smart Chatbot for Easier Expense Management

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INTERNSHIP BASE REPORT - WEEK 4

1. Overview of This Week's Work

During this week, I focused on enhancing the ChippyCash financial chatbot backend by improving its architecture, adding new features, and optimizing performance. The goal was to create a more responsive and feature-rich financial assistant that better serves users' personal finance management needs.

2. Work Completed

2.1. Building a Robust Backend Framework

The backend system now integrates FastAPI with LLM-based financial assistant capabilities:

- **FastAPI Integration:**
 - Implemented a clean API structure with proper endpoint definitions (/chat, /history, /delete)
 - Added CORS middleware to enable cross-origin requests, essential for frontend integration
 - Structured data models using Pydantic for request validation
- **User Session Management:**
 - Created persistent chat history storage in JSON format
 - Implemented user-specific data directories (db_chat/{id_user}/chat_history.json)
 - Added functionality to retrieve chat history through dedicated endpoints

2.2. Enhancing Financial Assistant Capabilities

- **Financial Data Processing:**
 - Added functions to track and analyze user income and expenses
 - Implemented save_income_expense and save_outcome_expense tools
 - Created a bill tracking system with persistent storage (db_store/{id_user}/bill.json)
- **Intelligent Financial Assistant:**

- Developed a specialized agent system using LlamaIndex and OpenAI
- Created custom function tools for financial calculations and data management
- Implemented memory management for contextual conversations about financial data
- **Security and Stability Enhancements:**
 - Added error handling mechanisms to prevent unexpected failures.
 - Implemented request validation to enhance API reliability.

3. Technologies Used

Backend:

- **PHP (Pure PHP):** Used for processing payment logic and storing transaction details.
- **MySQL:** Stores order information, linking purchases to user accounts.
- **Python (FastAPI/Flask):** Used to handle chatbot API requests efficiently.

Frontend:

- **HTML, CSS, JavaScript:** Updated the admin dashboard to display user purchase details.
- **Bootstrap:** Ensures a responsive and user-friendly interface.

Authentication & Security:

- **Session PHP:** Manages user authentication and access control.
- **Bcrypt (PHP password_hash):** Encrypts stored passwords for security.
- **Input Validation:** Prevents SQL injection and API abuse.

4. Completed Features

- Implemented a robust payment processing system that stores user purchase details.
- Developed an admin dashboard section for viewing purchase history.
- Optimized chatbot API for faster and more accurate responses.
- Enhanced system security and error handling for improved reliability.

