

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



**Fifth Report**  
**Foundation Internship**  
*ChippyCash*  
*Smart Chatbot for Easier Expense Management*

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# INTERNSHIP BASE REPORT - WEEK 5

## 1. Overview of This Week's Work

During this week, I focused on enhancing the ChippyCash chatbot by implementing a multi-role system that allows users to interact with different AI personality types. This improvement aims to provide users with a more personalized and engaging financial management experience by offering various interaction styles based on their preferences.

## 2. Work Completed

### 2.1. Implementation of Multi-Role AI Assistant System

- **Core Role Framework:**
  - Designed and implemented a flexible role-switching architecture.
  - Created three distinct AI personalities: "Trợ lý thông minh" (default), "Mama nóng tính", and "Homie".
- **Prompt Engineering:**
  - Developed specialized prompts for each role in `utils.py`
  - Optimized context retention across role changes.
- **API Enhancement:**
  - Updated the Chat class model to accept an optional role parameter
  - Implemented role-specific response generation
  - Added default role handling for backward compatibility

### 2.2. Distinctive Role Characteristics

- **Trợ lý thông minh (Smart Assistant):**
  - Professional, polite communication style
  - Comprehensive financial guidance and analysis
  - Detailed explanations of financial concepts
  - Automatic information storage without confirmation
- **Mama nóng tính (Strict Mother):**
  - Critical approach to wasteful spending
  - Vietnamese mother-style phrases and expressions
  - Strong emphasis on savings and financial discipline
  - Rare but meaningful praise for good financial decisions

- **Homie (Friend):**
  - Casual, friendly communication style
  - Gentle reminders about spending limits
  - Excessive praise for savings achievements
  - Advice delivered in a peer-to-peer format

### 2.3. Technical Improvements

- **Backend Optimization:**
  - Refactored prompt handling for better performance
  - Implemented role state maintenance between sessions
  - Enhanced context window management for role-specific histories
- **Data Management:**
  - Updated storage mechanisms to track role preferences
  - Maintained consistent financial data access across all roles
  - Improved data retrieval efficiency for role-specific interactions

## 3. Technologies Used

- **Backend:**
  - **Python (FastAPI):** Core API framework handling chatbot requests
  - **LlamaIndex/OpenAI:** Advanced language processing and response generation
  - **JSON:** Storage format for user data and chat histories
- **Prompt Engineering:**
  - **Custom role-based prompt templates**
  - **Context management for personality consistency**
  - **Dynamic response formatting based on role selection**
- **Data Management:**
  - **File-based storage system for user data and chat histories**
  - **Role-specific response processing**
  - **Consistent financial calculation tools across all roles**

## 4. Completed Features

- Multi-role AI assistant system with three distinct personalities
- Seamless role-switching capability within the chat interface

- Consistent financial functionality across all personality types
- Role-specific communication styles while maintaining financial expertise
- Enhanced user engagement through personalized interactions
- Backward compatibility with existing user sessions

## **5. Next Steps**

- Implement user role preference storage
- Add role selection interface in the frontend
- Develop additional personality types based on user feedback
- Enhance role-specific financial advice strategies
- Optimize memory usage for complex multi-role conversations