

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



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

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*Hà Nội - 2025*

# INTERNSHIP BASE REPORT - WEEK 6

## 1. Overview

This report outlines the major improvements implemented in the ChippyCash system during the internship. These upgrades aim to enhance user experience, performance, transaction management, and overall system intelligence.

## 2. UI/UX Enhancements

- Responsive interface using media queries to support multiple screen sizes.
- Visual effects such as `fadeIn` and `slideIn` animations for better user experience.
- UI performance optimizations including the use of ``will-change``, ``transform: translateZ(0)``, and ``backface-visibility: hidden``.
- Smooth transitions on hover and focus using ``transition: background-color 0.2s ease``.

## 3. Transaction Features

- Automatic transaction recognition from user input using AI.
- Batch transaction editing via modal interface.
- Quick transaction saving directly from chatbot interactions.
- Automatic transaction categorization based on text description.

## 4. Financial Analysis

- Spending trend analysis across time and comparison with previous months.
- Savings suggestions based on income and expenditure.

- Detection of overspending areas (e.g., spending over 30% in one category) and proposing reductions.
- Display and analysis of the income-to-expense ratio.

## **5. Smart Chatbot**

- Support for multiple roles such as Smart Assistant and Strict Mother.
- Personalized financial consultation based on user data.
- Auto-response with financial literacy rules like the 50/30/20 rule and emergency fund tips.
- Text-to-transaction conversion through chatbot input parsing.

## **6. Category Management**

- Full CRUD operations for income and expense categories.
- Conflict detection to prevent deletion of in-use categories.
- Usage statistics showing how often each category is used.
- Automatic update of all transactions when a category name is changed.

## **7. Performance Optimization**

- Asynchronous handling of operations using Promises and async/await.
- SQL transactions used to ensure data integrity during multi-insert operations.
- Input validation and sanitization to prevent SQL injection.
- Clear error handling with rollback mechanism.

## **8. Filtering and Display Options**

- Multi-criteria filters (by type, month, year, and category).
- Friendly UI when no data is available.
- Pagination support for transaction lists.
- Data grouping for easier tracking and comparison.

## **9. Conclusion**

- The improvements outlined above significantly contribute to making ChippyCash a comprehensive, intelligent, and user-friendly financial management system.