MOMO Data Analysis Project Report

Project Overview

This report summarizes the approach, challenges, and key decisions made during the development of the MOMO Data Analysis project. The project aims to analyze and visualize Mobile Money (MOMO) transaction data extracted from SMS messages to derive meaningful insights and patterns.

Approach

1. Data Collection and Processing

- Implemented XML parsing to extract transaction data from SMS messages
- Created a robust SMS body parser to handle multiple transaction patterns:
  * Incoming money transfers
  * Payments to code holders
  * Transfers to mobile numbers
  * Bank deposits
  * Cash withdrawals from agents
- Developed data cleaning procedures to ensure accurate transaction categorization

2. Data Storage and Management

- Implemented SQLite database for efficient transaction storage
- Created a structured database schema with fields for:
  * Transaction ID
  * Sender/Recipient name
  * Transaction amount
  * Transaction type
  * Date
  * Phone number
  * Balance after transaction
- Developed database management functions for data insertion and retrieval

3. Web Application Development

- Built a Flask-based web application for data visualization

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- Implemented interactive dashboard with:
  * Transaction overview
  * Transaction type distribution charts
  * Individual transaction history
  * Person-specific transaction analysis
- Created RESTful API endpoints for data access

Challenges Encountered

1. Data Processing Challenges
- Complex SMS message formats requiring multiple parsing patterns
- Inconsistent message structures across different transaction types
- Handling of special characters and number formatting in amounts

2. Technical Challenges
- Frontend-backend integration difficulties due to team's limited experience with full-stack development
- Real-time data processing and visualization requirements
- Efficient database querying for large transaction datasets

3. Implementation Challenges
- Accurate transaction categorization from SMS text
- Handling of edge cases in message parsing
- Maintaining data consistency across the application

Key Decisions

1. Technology Stack
- Python as the primary programming language
- Flask for web application framework
- SQLite for database management
- XML parsing for data extraction
- HTML/JavaScript for frontend visualization

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2. Architecture Choices

- Modular design separating:
  * Data processing (process_xml.py)
  * Database management (database.py)
  * Web application (app.py)
- RESTful API design for data access
- Template-based frontend rendering

3. Data Processing Strategy

- Pattern-based SMS parsing for different transaction types
- Robust error handling in data processing
- Transaction validation before database insertion

Conclusion

The MOMO Data Analysis project successfully implemented a comprehensive solution for analyzing mobile money transaction data. The system effectively processes SMS messages, stores transaction data, and provides meaningful visualizations through an interactive web interface. Despite challenges in frontend-backend integration and data processing, the project delivered a functional and useful tool for transaction analysis.

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