MTN MoMo SMS Data Analysis - Project Report

1. Introduction

This fullstack project analyzes and visualizes MTN MoMo transaction SMS data. It parses XML-formatted messages, categorizes them into financial types, stores them in a database, and presents the results through a fully responsive web dashboard.

2. Architecture Overview

The system includes:

- Backend (Python): XML parsing, cleaning, categorization, and API serving
- Database: SQLite relational storage
- API: Flask endpoints to deliver JSON data to the frontend
- Frontend: HTML/CSS/JavaScript with responsive design and Chart.js visualizations

3. Data Processing

The XML file was parsed using Python's ElementTree. Over 1600 messages were analyzed. Each message was cleaned, normalized (amounts, dates), and matched to categories such as Payment, Incoming Money, Bank Deposit, Peer Transfer, Withdrawal, etc. Unmatched messages were logged separately.

4. Dashboard and Responsiveness

The dashboard is fully responsive across phones, tablets, and desktops. Features include:

- Total amount by transaction type (bar chart)
- Monthly summaries (line chart)
- Distribution by type (pie chart)
- Search bar with dynamic matching and 'no results' message
- Unique colors for each category to improve readability

5. Challenges and Solutions

The SMS formats varied widely, requiring regex-based categorization. Some entries lacked identifiable keywords, and were logged for inspection. Visual similarity in charts was corrected by introducing a consistent and varied color scheme.

6. Conclusion

This application meets all assignment requirements and includes the bonus API integration. It is efficient, informative, and accessible across all screen types, making it practical for business use or presentation to MTN for further development.