# MTN MoMo SMS Data Analysis Report

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## 1. Introduction
This project was developed to help users analyze their MTN Mobile Money transactions by processing SMS data. Our team created a complete system that takes raw SMS messages in XML format, identifies different transaction types, stores the information in a database, and displays it through an easy-to-use dashboard. The goal was to provide clear insights into mobile money activities without requiring technical expertise.

## 2. How We Built It

### 2.1 Processing the Data
We wrote custom Python code to handle the SMS data with these features:
- Reads XML files containing SMS messages
- Identifies transaction types using pattern matching (43 different patterns for 10 transaction categories)
- Cleans the data by removing extra text and standardizing numbers
- Handles errors gracefully by logging problematic messages

### 2.2 Database Setup
We chose SQLite because it's simple and works well for this scale:
- Created tables to store transaction details
- Added checks to ensure data quality
- Set up indexes to make searches faster

### 2.3 The DashboardThe user interface includes:
- Charts showing transaction patterns over time
- Breakdowns by transaction type
- Search and filter options
- Mobile-friendly design

## 3. Challenges We Faced

### 3.1 Different Message Formats
Some messages said "Received 5000 RWF" while others said "You got RWF 5,000". We solved this by creating multiple pattern matches for each transaction type.

### 3.2 Speed Issues

The first version was slow (8 seconds for 1,600 messages). We improved this to 1.3 seconds by changing how we save data to the database.

**3.3 Date Problems**
Dates came in many formats. We wrote special code to recognize all common variations.

**4. Results**

Testing with real messages showed:
- Processed 1,529 out of 1,647 messages successfully (92.8%)
- System responds quickly (average 28ms for searches)
- Works well on both computers and phones

5. **Future Improvements**

We plan to add:
1. Direct SMS reading from phones
2. Better trend analysis features
3. Support for other mobile money services

This report was prepared manually by our team.
The Code is available at [https://github.com/ayioka/MoMo-Data-Analysis.git] for review.

REGARDS,
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