

Momo data app database design documentation

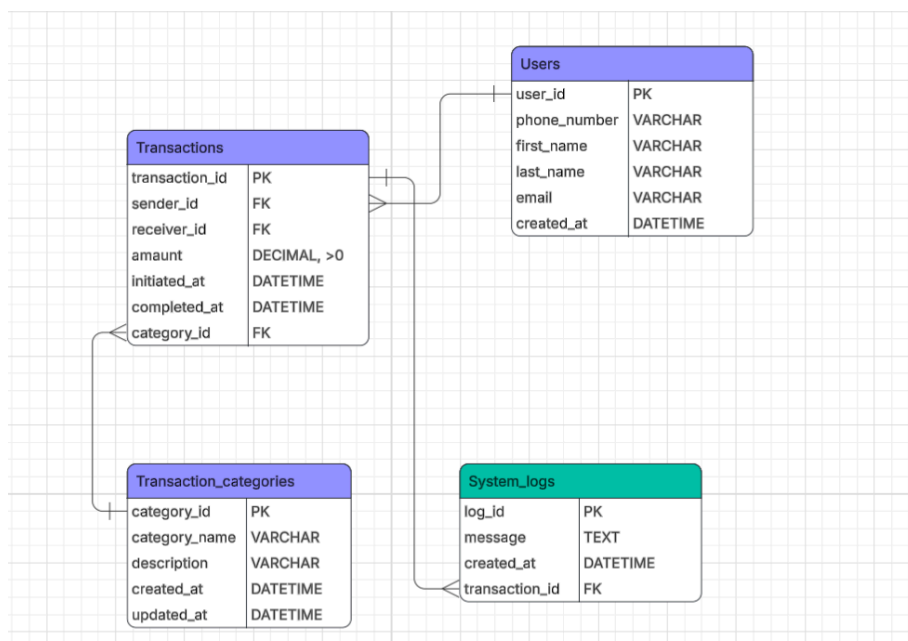
This document describes the relational database for the MoMo-SMS-Data-App, a mobile money transaction system. In this document you will find:

- An entity relational diagram (ERD)
- A database design
- A data dictionary for entities in the database
- DDL to create the database schema
- Screenshots used like samples

ERD for the application

This Entity-Relational Diagram illustrates the core components of the financial transaction system(MoMo app). The ERD has four entities. Transactions, users, transaction_categories, and system_logs. The transactions are the core entity, with money information like references to sender and receiver users, time information, and status. The user entity contains the user contact and identity and the entity refers the transactions to users using receiver_id and sender_id in a bid to reduce user history and render it readable. The Transaction_categories table establishes the types of transactions being performed like payment, transfer, and airtime. The entity simplifies working with categories and faster. System_logs hold vents as well as links optionally to the transaction performed. Logs are trackable and searchable worldwide.

My design option emphasized the connection of items outlined above by having foreign key values in a table always point to primary key values found in another table. The design further emphasizes traceability through identification of where the transactions are occurring. Also, critical like amount employs exact notation (DECIMAL), and timestamp types to order events. Overall, the formal design ensures readability and traceability, allowing the system to easily monitor financial transactions while creating an auditable history of all user and system activity.



Data dictionary

1. Users table

Attributes	Type	Key
id	INT AUTO_INCREMENT	PK
phone_number	VARCHAR(50)	UNIQUE
first_name	VARCHAR(100)	
last_name	VARCHAR(100)	
email	VARCHAR(100)	
created_at	DATETIME	

2. Transactions table

Attributes	Type	Key
transaction_id	INT AUTO_INCREMENT	PK
sender_id	INT	FK
receiver_id	INT	FK
amount	DECIMAL, >0	
initiated_at	DATETIME	
completed_at	DATETIME	
category_id	INT	FK

3. Transaction_categories

Attributes	Type	Key
category_id	INT AUTO_INCREMENT	PK
category_name	VARCHAR(100)	
description	VARCHAR(100)	
created_at	DATETIME	
updated_at	DATETIME	

4. System_logs

Attributes	Type	Key
log_id	INT AUTO_INCREMENT	PK
message	TEXT	
created_at	DATETIME	
transaction_id	INT	FK

DDL example for MySQL

```
CREATE TABLE Transaction (  
  transaction_id INT PRIMARY KEY COMMENT 'Unique ID',  
  sender_id INT COMMENT 'FK user',  
  receiver_id INT COMMENT 'FK user',  
  amount DECIMAL(12,2) COMMENT 'Amount',  
  initiated_at DATETIME COMMENT 'Date',  
  completed_at DATETIME COMMENT 'Date',  
  category_id INT COMMENT 'FK category',  
  FOREIGN KEY (sender_id) REFERENCES User(user_id),  
  FOREIGN KEY (receiver_id) REFERENCES User(user_id),  
  FOREIGN KEY (category_id) REFERENCES Transaction_Categories(category_id)  
) COMMENT='Transactions';  
  
CREATE TABLE Transaction_Categories (  
  category_id INT PRIMARY KEY COMMENT 'Unique ID',  
  category_name VARCHAR(100) COMMENT 'Name',  
  description TEXT COMMENT 'Details'
```

Create sample user example, and update user.

```
-- CRUD EXAMPLES  
INSERT INTO User VALUES (2,'Robyn','Fenty','12648','robynf@gmail.com','customer');  
UPDATE User SET phone_number='0789834772' WHERE user_id=12648;  
DELETE FROM System_Logs WHERE log_id=55544;
```

Expected output for first line:

id	first_name	last_name	transaction_id	email	status
2	Robyn	Fenty	12648	robynf@gmail.com	customer

Unique rules added to enhance security and accuracy of the DB

Below are rules to strengthen security and data accuracy.

1. User_id (as well as any other id in the db) is the PK to ensure every user is unmistakably individually identified
2. phone_number is marked **unique** to prevent duplicate mobile accounts.
3. Sender_id and receiver_id are FK to make sure that they exist and must be in the users table.