Mobile Money (MoMo) Database Design Documentation

Design Decisions and Justifications

1. Data Type Optimizations

We currently have phone numbers as INT as it is small scale and assumed to operate only in Rwanda, that is before the expansion to other countries where we would have to change the data type from INT to BIGINT. Money amounts, fee, the ids are also all integers as we can't have decimals given that the currency is RWF. The rest are variable characters as they will be strings.

2. Audit Trail and Compliance

The `SystemLogs` table provides comprehensive audit trails required for financial systems. Transaction references were added to enable easy tracking and dispute resolution.

3. Transaction Categorization

The **Transaction Categories** table separates transaction types from the main transaction data, promoting data normalization and flexibility. We included both `TransactionType` and `PaymentType` fields for hierarchical categorization (e.g., Transfer/Mobile_Money, Deposit/Cash_In), enabling detailed reporting and business intelligence

4. Communication Integration

The **SMS** table is for direct link between transactions and users, ensuring every transaction can trigger appropriate notifications. The composite relationship (TransactionId + UserId) allows multiple SMS messages per transaction, which allows both sender and receiver to get notifications.

User

PK	UserId	Int
	FullNames	Varchar(250)
	PhoneNumber	Int

SMS

PK	SMSId	Int
PK	TransactionId	Int
	Message	varchar(500)
FK	UserId	Int

Transaction categories

PK	categoryId	Int
	TransactionType	varchar(50)
Key	paymentType	varchar(50)

Transactions

PK	TransactionId	Int
	Fee	Int
	Amount	Int
	balance	Int
	initialBalance	Int
FK	senderUserId	Int
FK	receiverUserId	Int
	transactionDate	Datetime
FK	categoryId	Int

SystemLogs

PK	logId	varchar(20)
	status	varchar(40)
Fk	transactionId	Int
	timestamp	