A logo with a design on it

Description automatically generated

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**Software Requirements Specification**

**BankIslami ATM Simulator System**

**1. System Purpose**

This system simulates a Sharia-compliant ATM interface with Pakistani banking conventions, implementing core functionalities observed in the code:

1. User Authentication via 16-digit card numbers and 4-digit MPIN

2. 3-Step Account Registration with CNIC validation

3. Financial Transactions: Withdrawals, Deposits, Fast Cash

4. Account Management: Balance checks, MPIN changes, transaction history

5. Database Integration with MySQL for persistent storage

**2. Detailed Functional Requirements**

**2.1 Authentication System**

**2.1.1 Login Process**

Accepts 16-digit card number (`Card Number:` JTextField)

4-digit MPIN input (`MPIN:` JPasswordField)

Validates against `islami\_bank\_users` table

Failed attempts show error dialogs with Pakistani formatting

Successful login redirects to Transaction menu

**2.1.2 Security Features**

MPIN stored as plaintext (to be hashed in implementation)

Input validation:

if(cardno.length() != 16 || !cardno.matches("\\d+")){

JOptionPane.showMessageDialog(null, "Invalid Card Number\nMust be 16 digits");

}

**2.2 Account Registration**

**Phase 1:** Personal Information (Signupone.java)

Collects:

Full name & guardian's name (JTextFields)

CNIC with format validation (`12345-1234567-1`)

Pakistani address fields (province/city dropdowns)

Marital status (radio buttons)

**Phase 2:** Financial Details (Signuptwo.java)

Account type selection: Islamic Savings/Al-Amanah/Current

Income bracket selection (PKR 500k-5M+)

Occupation dropdown with Pakistani-specific options

**Phase 3:** Final Setup (Signupthree.java)

Auto-generates:

16-digit card number starting with '4'

Random 4-digit MPIN

Service selection: ATM Card/Mobile Banking

Stores data in `bankislami\_accounts` and `bankislami\_login` tables

**2.3 Transaction Processing**

**2.3.1 Cash Withdrawal (Withdrawal.java)**

Input field with PKR amount

**Validation:**

if(!amount.matches("\\d+")) // Numbers only

if(withdrawalAmount > 50000) // PKR 50k limit

Updates `bankislami\_transactions` table

**2.3.2 Fast Cash (FastCash.java)**

Predefined amounts: 1k, 5k, 10k, 15k, 20k, 25k PKR

Direct transaction processing via buttons

**2.3.3 Deposit (Deposit.java)**

Accepts amounts up to PKR 500,000

Records as `DEPOSIT` type in transactions

**2.4 Account Services**

2.4.1 Balance Inquiry (BalanceEnquiry.java)

Calculates balance from transaction history:

SELECT SUM(CASE WHEN transaction\_type = 'DEPOSIT' THEN amount ELSE -amount END)

**2.4.2 MPIN Change (PinChange.java)**

Requires new MPIN confirmation

Updates `bankislami\_login` table

**2.4.3 Mini Statement (MiniStatement.java)**

Displays last 10 transactions with:

Masked card numbers (`XXXX-XXXX-XXXX-1234`)

PKR currency formatting

Date/time stamps

**3. Non-Functional Requirements**

**3.1 Security**

MySQL SSL connections (as per Connections.java)

Input sanitization using PreparedStatements

CNIC format enforcement (`\\d{5}-\\d{7}-\\d`)

**3.2 Reliability**

Transaction rollback on failure

Database connection pooling

Error handling with user-friendly JOptionPane messages

**3.3 Compliance**

State Bank of Pakistan KYC requirements through CNIC collection

Pakistani address validation (province/city dropdowns)

**4. System Workflow**

flowchart TD

A[Start] --> B{User Type}

B -->|New| C[Signup Step 1]

C --> D[Signup Step 2]

D --> E[Signup Step 3]

B -->|Existing| F[Login]

F --> G[Transaction Menu]

G --> H[Withdraw]

G --> I[Deposit]

G --> J[Fast Cash]

G --> K[Balance Check]

G --> L[MPIN Change]

G --> M[Transaction History]

**5. Database Schema**

**5.1 Key Tables**

islami\_bank\_users {

String card\_number PK

String mpin

}

bankislami\_transactions {

Int transaction\_id PK

String mpin FK

Timestamp transaction\_date

String transaction\_type

Decimal amount

}

bankislami\_accounts {

String form\_no PK

String account\_type

String card\_number

String mpin

}

**6. Dependencies**

1. MySQL 5.7+: Required for table structure shown in Connections.java

2. JCalendar Library: Date selection in Signupone.java

3. Java Swing: GUI components throughout all classes

4. MySQL Connector/J 8.0+: JDBC driver for database operations

**7. Constraints**

Pakistani-specific formats: CNIC, currency (PKR), address fields

Maximum withdrawal limit: PKR 50,000 per transaction

Card number generation: Strict 16-digit format starting with '4'