### Problem Statement

The personal finance tracker app empowers users to manage their finances effectively by tracking income, expenses, budgets, and financial goals. It offers a consolidated view of transactions and provides reports with actionable insights to help users stay on track with their financial plans.

### Key Business Requirements and Software Qualities

#### Business Requirements:

1. **Expense Tracking:** Log all expenses with categories and timestamps.
2. **Income Tracking:** Record income sources with categories and timestamps.
3. **Budget Management:** Allow users to set and monitor spending limits.
4. **Goal Setting:** Define and track financial goals (e.g., saving for a trip or emergency fund).
5. **Reports:** Generate insights into financial activity, including categorized spending and income analysis.
6. **Metrics Card:** Display total income, expenses, budget utilization, and goal progress.

#### Software Qualities:

1. **Simplicity:** User-friendly interface for managing financial activities.
2. **Performance:** Real-time updates for the metrics card and reports.
3. **Customizability:** Flexible category and goal definitions.
4. **Security:** Secure user data with encryption.
5. **Cross-Platform Support:** Compatibility with Android and iOS devices.

### Conceptual Model

#### Main Entities:

1. **User:** Represents an individual using the app.
2. **Transaction:** A record of income or expense with category, amount, and timestamp.
3. **Budget:** Spending limit set for a specific time period and/or category.
4. **Goal:** A financial target with progress tracking (e.g., save $5000 by June).
5. **Report:** Summarized insights into financial activities.

#### Relationships:

* A **User** has many **Transactions**, **Budgets**, and **Goals**.
* A **Transaction** belongs to a **User** and optionally contributes to a **Budget** or **Goal**.
* A **Report** aggregates data from **Transactions**, **Budgets**, and **Goals**.

### Technical Domain Model

#### Interactions:

1. **User - Transaction:** Users create, update, and delete income or expense entries.
2. **User - Budget:** Users define budgets and track their utilization.
3. **User - Goal:** Users set savings or spending goals and monitor progress.
4. **Metrics Card - Transaction/Budget/Goal:** Displays summarized financial data.
5. **User - Report:** Users view insights into categorized transactions, budget utilization, and goal progress.

### Database Domain Model

#### Entities and Attributes:

**User:**

* + id (Primary Key)
  + name
  + email
  + password (hashed)

**Transaction:**

* + id (Primary Key)
  + user\_id (Foreign Key)
  + type (Income/Expense)
  + amount
  + category
  + timestamp
  + description

**Budget:**

* + id (Primary Key)
  + user\_id (Foreign Key)
  + category
  + amount\_limit
  + start\_date
  + end\_date
  + current\_spending (calculated from transactions)

**Goal:**

* + id (Primary Key)
  + user\_id (Foreign Key)
  + target\_amount
  + saved\_amount
  + description
  + due\_date

**Report:**

* + id (Primary Key)
  + user\_id (Foreign Key)
  + type (e.g., Monthly, Yearly)
  + generated\_on
  + data (PDF)

#### Relationships:

* **User - Transaction:** One-to-Many
* **User - Budget:** One-to-Many
* **User - Goal:** One-to-Many

### Metrics Card

The metrics card dynamically displays:

1. **Total Income**: SUM of all income transactions.
2. **Total Expenses**: SUM of all expense transactions.
3. **Budget Utilization**: (Total Spending / Budget Limit) \* 100%.
4. **Goal Progress**: (Saved Amount / Target Amount) \* 100%.

### Example Database Schema

#### Users Table:

| ID | Name | Email | Password |
| --- | --- | --- | --- |

#### Transactions Table:

| ID | User\_ID | Type | Amount | Category | Timestamp | Description |
| --- | --- | --- | --- | --- | --- | --- |

#### Budgets Table:

| ID | User\_ID | Category | Amount\_Limit | Start\_Date | End\_Date | Current\_Spending |
| --- | --- | --- | --- | --- | --- | --- |

#### Goals Table:

| ID | User\_ID | Target\_Amount | Saved\_Amount | Description | Due\_Date |
| --- | --- | --- | --- | --- | --- |

#### Reports Table:

| ID | User\_ID | Type | Generated\_On | Data |
| --- | --- | --- | --- | --- |