CSE305 Software Engineering - Domain Model (Revize)

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Project: My Budget Flow (Budget & Cash Flow Manager)
Methodology: Agile
Platform: Mobile

1. Project Overview

1.1. Purpose and Goal

The primary goal of this project is to develop a mobile application, "My Budget Flow." The system's core focus is on personal cash flow management, expense tracking, and savings goal management.

Unlike traditional asset trackers that require manual updates of every bank account balance, this application focuses on the flow of money (Income vs. Expense). It provides an intuitive interface for users to log daily transactions, manage recurring payments (like rent or subscriptions), and track progress toward financial goals.

1.2. Scope Definition

The Minimum Viable Product (MVP) will focus on flow tracking and budgeting.

1. User Authentication: Secure registration and login.
2. Transaction Management: Full CRUD operations for logging 'Income' and 'Expense' transactions with categorization, date, and description.
3. Recurring Transactions: Management of regular financial items (e.g., Salaries, Bills, Subscriptions) that occur monthly.
4. Dashboard & Analytics: A summary screen calculating "Remaining Budget" based on (Total Income - Total Expense) and visualizing spending habits.
5. Goal Management: CRUD for setting and tracking financial goals linked to savings or expense limits.

1.3. Technology Stack

- Frontend (Mobile): Flutter (using Dart language).
- Backend (BaaS): Firebase.
    - Authentication: Firebase Authentication.
    - Database: Cloud Firestore (NoSQL).

2. Problem Domain Description

The system centers on the User. A User must register and authenticate to access their private financial data.

The core activity of the User is logging Transactions. Each Transaction represents a single financial movement with an amount, date, type ('Income' or 'Expense'), and categoryName (e.g., 'Groceries', 'Salary').

To handle fixed monthly flows, the User can define RecurringTransactions. These are templates (e.g., "Netflix Subscription", "House Rent") that have a specific dayOfMonth. The system uses these to project future expenses or quickly add them to the actual transaction log.

The Dashboard acts as the central hub, calculating the User's "Liquidity" or "Savings" purely based on the history of transactions (Total Income minus Total Expenses), removing the need for manually updating independent asset balances.

Finally, the User can set personal financial Goals. A Goal tracks progress towards a target amount, helping the user save money or limit spending in specific categories.

3. Domain Model (Conceptual Classes and Relationships)

Class: User (Kullanıcı)

The primary actor. All data is owned by a User.

- Attributes:
    - userId (PK - From Firebase Auth)
    - email (Unique)
    - firstName, lastName
    - registrationDate
    - birthDate
- Relationships:
    - 1-to-Many (1..*) -> Transaction
    - 1-to-Many (0..*) -> RecurringTransaction
    - 1-to-Many (0..*) -> Goal

Class: Transaction (İşlem)

The core entity for budgeting; a single income or expense record.

- Attributes:
    - transactionId (PK - Auto-generated)
    - userId (FK)
    - title (e.g., "Migros Alışverişi")
    - amount (Double)
    - type (Enum: 'Income' | 'Expense')
    - categoryName (String, e.g., "Market", "Fatura")
    - date (Timestamp)
    - description (Optional user notes)
- Relationships:
    - Many-to-One (*..1) -> User

Class: RecurringTransaction (Düzenli İşlem)

Represents fixed monthly incomes or expenses (Rent, Salary, Netflix).

- Attributes:
    - recurringId (PK - Auto-generated)
    - userId (FK)
    - title (e.g., "Ev Kirası", "Spotify")
    - amount (Double)
    - type (Enum: 'Income' | 'Expense')
    - categoryName (String)
    - dayOfMonth (Int: 1-31, Represents which day it occurs)
    - isActive (Boolean - User can pause it)
- Relationships:
    - Many-to-One (*..1) -> User

Class: Goal (Hedef)

A flexible entity for tracking financial targets.

- Attributes:
  - goalId (PK - Auto-generated)
  - userId (FK)
  - name (e.g., "Tatil Fonu")
  - targetAmount (The goal value)
  - currentAmount (Saved so far)
  - deadline (Optional Date)
- Relationships:
  - Many-to-One (*..1) -> User

4. Visual Diagram