Database Topic: Financial Management and Budgeting

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Database Specification

The database is designed to serve as the backend infrastructure for a budgeting application. It aims to organize and manage user financial data efficiently while providing features for budgeting, expense tracking, debt management, goal setting, and subscription management.

Database Purpose

The purpose of the database is to store and track data pertaining to users'' financial transactions, assets, and debt, to report on and manage budgets and goals while maintaining payment information, subscription details, and basic profile information. The users will primarily use the database to run reporting queries.

Business Problems Addressed

- Facilitate budgeting, expense tracking, debt repayment, financial goal monitoring, and subscription management functionalities within the budgeting application.
- Provide transparency into transaction and spending habits holistically from different data sources.
- Facilitate users to manage assets, debts, and subscriptions efficiently.
- Provide a tool for accountability in setting and monitoring financial goals while introducing budgeting tools, expense tracking, and subscription management.

Business Rules:

- Each user must have or more addresses
- Each user must have one or more payment methods
- Each user must have zero or more financial transactions (inflows & outflows)
- Each financial transaction (inflow & outflow) must be associated with a category
- Each user can have one or more asset
- Each user can have one or more debt
- Each user can have zero or more budgets set
- Each user can have zero or more financial goals set
- Each user can only have one active subscription at a time
- Each subscription can have one or more users subscribed to them
- Each user can have zero or more accounts
- A financial institution is assumed to be a bank
- Each payment must be associated with a payment method
- Each bill can have zero or more payments
- Each bill is associated with one user
- Each asset should have a type

- Each debt should have a type
- One asset cannot have more than one type
- One debt cannot have more than one type

Design Decisions

Entity Name	Why Included	How Related to Other Entities
User	The User entity is included in the database to represent individual users of the application for budget management (personalized financial management). In the context of the database design, the User entity serves as the central entity around which other entities revolve and interact.	The User entity in the database is related to other entities through various types of relationships. Users can have billing information associated with their account for subscribing to premium services or managing payment details. They also make payments, and have tracking of payment history. Incoming and outgoing financial transactions are attributed to specific users, aiding in analyzing income sources and spending habits. Additionally, users may have debts and assets associated with their accounts for managing financial liabilities and tracking asset accumulation. Users set budgets, and track financial goals, creating a comprehensive framework for effective financial management.
Billing	Bill entity helps manage user subscriptions. It records billing information associated with subscription plans, renewal dates, and payment methods, ensuring that users receive uninterrupted access to the services they subscribe to.	Linked to Users: Each bill is associated with a specific user, facilitating personalized bill management and payment tracking.
Address	Address entities store contact information essential for communication and verification purposes.	Associated with Users: Each address is linked to a specific user, providing accurate contact details for communication and verification. Associated with Financial Institutions: Addresses may be associated with financial institutions where users hold accounts, facilitating identification. Payment Method: Addresses must be associated with a payment method for billing purposes.

Payments	Records payments made by users. Records payments made by users, facilitating a comprehensive view of financial transactions.	Associated with the User entity to maintain payment history and methods.
Payment Method	Payment Method stores payment information securely for billing purposes, ensuring safe and convenient payment processing.	Each payment method is associated with a specific user, allowing secure billing and payment processing.
Inflow	Inflow records financial transactions involving inflows of money, such as income and deposits.	Associated with Accounts: Inflows are linked to specific accounts, indicating the source or destination of funds for tracking purposes. Associated with Categories: Transactions are categorized to facilitate budgeting, reporting, and analysis of spending habits.
Outflow	Outflows entity provides information on where the user is allocating the funds that are coming in with the inflows, and provides an outlook on day to day spending habits. Gives us insight into patterns and where more attention should be paid while improving financial health.	Associated with Accounts: Outflows are linked to specific accounts, indicating the source or destination of funds for tracking purposes. Associated with Categories: Transactions are categorized to facilitate budgeting, reporting, and analysis of spending habits.
Debt	Manages information about debts with the goal of debt reduction	Associated with Users: Each debt is associated with a user, indicating the borrower responsible for repayment.
Asset	A key indicator of financial wellbeing is the accumulation of assets and goals as they pertain to assets and asset growth. We are interested in tracking how the net assets, as well as total assets of a user will grow over time. Capturing this information will enable us in detecting potential information on the spending and saving habits of users who are able to grow their assets, versus the ones that don't, and many other metadata points that relate to assets within the scope of overall financial wellness	The Asset entity is directly related to the user entity and is a key indicator of financial growth. A user can have only one asset, and an asset can only be owned by one user.

Budget	The budget is the core functionality of our application. In order to improve financial well being, tracking alone is not sufficient. Certain goals need to be set, at a category level. The amount of money to be spent in a certain group is called a budget. This entity will track the current spending in the category, along with setting limits for how much should be spent within each category. This will allow us to track user spending in each category, and alert the user for when they get close to or over the set budget for the time period.	The budget entity, like all entities, is primarily associated with the user, but is also related to the category entity, since each budget is set for a category, but different users can have different amounts set as the limit for each category. Through the category entity, the budget is also connected to inflows and outflow. The sum of the outflow transactions for a category will determine if the limit for that category has been reached or not.
Goals	The goals are longer term financial goals for a user. This can be anything from saving for a vacation, to buying a home or repaying debt, start saving. Financial goals are critical when providing any wellbeing, as they help measure progress and also determine what metrics to track. For someone with debt reduction as a financial goal, the action items are going to look much differently than someone with asset growth goals in mind.This is critical information when giving recommendations to users and tailor the best user experience.	Goals are linked to the user entity directly. Users set financial goals for themselves. This relationship allows users to track progress toward achieving their financial objectives. A user can and should have multiple goals, or could have no goals set. But a goal cannot exist without a user present.
Category	Category represents financial categories for expense and for inflows aiding in detailed expense categorization and transaction tracking. Categories also help us understand users' spending habits, and their ability to stick to a budget.	Category is linked to Budget, Inflow, Outflow entities to classify and analyze spending patterns. A category will have many budgets set by many users, it will also have amny inflows and outflows. A category can exist independently of all entities that are related to it, but a budget, inflow or outflow cannot exist without a category. The cases where a transaction is "uncategorized', it will be labeled as "uncategorized" and that will still be a category
Financial Institutions	Financial Institutions record details about banks and other financial organizations where users hold accounts.	Financial institutions are linked to user accounts, indicating where users hold their financial accounts, where they allocate their funds to build assets and reduce liabilities.

Accounts	This is the exhaustive list for user accounts that we interface with to gather information regarding their inflows and outflows. Payment history and spending habits data is scraped from these accounts	Each account will have multiple accounts, each account will provide information on inflows and outflow. The inflows will have an account id on them to indicate in which account of the user the transaction took place. This will also help us identify the movement of funds between the different accounts of the user.
SubscriptionPlan	Subscription Plan manages subscription plans and billing periods, ensuring uninterrupted access to premium features.	Each subscription plan is associated with a specific user, enabling personalized subscription management and billing. Also linked to a Payment Method as they are billed using payment methods associated with users' accounts, ensuring seamless subscription renewals.
SubscriptionPlanUserMap	Subscription Plan User Map maintains the relationship between users and their subscription plans, including start and end dates.	Each entry in the map corresponds to a specific subscription plan, ensuring accurate association with users.
Type	Type represents the financial label for an asset or a debt. Types help with reporting on assets and/or debt entities for easier understanding of where to allocate money first when repaying debts based on users financial priorities	Each asset and debt will map to a specific type. Types can be associated with many different assets or debts at the same time. An asset or debt cannot have more than one type at a time.