**Functional Requirements Document of APT final project *Expense Splitter***

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# Purpose

*Expense Splitter* is an app aims to help people who live together to split their bills(e.g. utility) and living expenses (grocery/commodity costs) evenly and wisely. It also provides task planning, spending analyzing, and notepad tools to ease the users’ burden of their daily life.

# Functional Components

## 1. Expense Management Functionality

This component is in charge of expense tracking. An expense may consist of multiple spending items. Its main responsibility is letting users to create/update/remove expenses under their shared account(e.g. an apartment).

## 2. Task Planning Functionality

Users can use this component to create a shared task and complete a task. For example, a user can post a task saying he needs trash bags (and also specifies it). Later his roommate can complete this task and the amount of money spent will be split evenly among the related users.

## 3. Spending Analyzer

The spending analyzer gets activated when the status of shared expense in an account changes. Particularly, it may caused by someone completes a task or adds a new spending item within an expense.

## 4. Payment Functionality

Every month all the users under the same shared account need to settle down their own expenses at least once. This component takes the payment information (from which user to which user, and the amount of money) and uses the PayPal mobile API to transfer the money.

The user can also finish this process offline (pay by cash). The sender can create a cash payment and the receiver will need to acknowledge this payment.

## 5. Notepad Functionality

This component is like a mobile/web version of the old fridge notepads. However it differs from the paper ones in the sense that users can have the information of read receipts(i.e. When another user reads the note, everyone can know that he has read the message).

# Front End Features

1. ***User Registration***

A user uses his Google account to sign-in. The system should be able to create a local account which includes the followed information:

parameters: {user\_email, user\_nikename, profile\_image\_url, paypal\_account(optional)}

return null.

1. ***User Login:***

After the user passed the google authentication and presses the ‘enter’ button, it generates a login request to the server which returns request status, identifier-normal, the user information, shared account information, the amount of money owed by and owes to other users, and ongoing expenses(unsettled). If the user has not registered, it returns request status and an identifier-uninitialized. If the user has not joined any account, it returns request status and an identifier-.

Parameters: {user\_email}

Return values as described above.

1. ***Create an apartment (Shared Account)***

A user creates a shared account (apartment) and invites the participants to join.

parameters: {user\_email, account\_name, user\_emails[]}

return: {account\_id, account\_name}

1. ***Join an apartment (Shared Account)***

A user joins a shared account.

parameters: {user\_email, account\_name}

return: success/fail

1. ***View an apartment (shared account)***

A user can check the account to get information of the account, current spending of each participant, and how much this user owes to/by every other participant.

parameters: {user\_email, account\_id}

1. ***Create a new expense***

A user creates a new expense(of which only he can remove it). The items list will be initialized as an empty list. An expense has one **tag** attached.

parameter: {expense\_name, user\_email, account\_id, participant\_emails[], tag(optional), items\_list[]}

return: success{expense\_id}/ fail (participant or item information contain mistake)

1. ***Add participants(users) to an expense***

The expense creator can relate users under the same shared account to a specific expense.

parameters: {creator\_email, account\_id, participant\_emails[], expense\_id}

1. ***View an expense***

A participant is able to check an expense. The result contains the basic information about the expense and all the spending items under it.

parameters: {user\_email, expense\_id}

return: {expense\_id, expense\_name, participants\_email[], cost, items[]}

(Note: the items list should contain the complete item objects, and the cost is calculated from the costs of these items.)

1. ***Add an item to the expense***

A participant of a expense can add new spending items to an existing expense.

parameters: {user\_email, item\_name(str), cost(double), date}

return: status, item\_id

1. **Check the unsettled expenses (\*\*\* Current Expenses)**

Check all the unsettled expenses related to an user.

parameters: {user\_email, account\_id}

return: status, {amount\_to\_settle(money, double), expense\_list[]}

(Every expense contains all the item and their details)

1. **Check expenses history**

Check expense history for a period of time, returns the total money spent, the amount of money spent by him, and amount of money he owed to the others.

parameters: {user\_email, account\_id, start\_date, end\_date}

return: status, {}

1. **View spending trend**

A user can check the spending trend of a shared account.

parameters: {user\_email, account\_id, start\_date, end\_date} (default period: one month)

return: status, {total\_money\_spent(doube), details:{{tag1(str), money\_spent(double), percentage1}, {tag2(str), money\_spent(double), percentage2} ...}}

1. **Create a task**

(this functionality is not available yet)

Apartment members can create a task with descriptions, picture and due date to be finished later.

1. **Complete a task**

(this functionality is not available yet)

Once an apartment members finish a task, the service will build a corresponding expense, and add it to the apartment.

1. **Create/edit a note**

Each apartment has a unique notepad, and apartment members can add note to this notepad. Each note is visible for all apartment members, however, only the note creator is allowed to edit it.

1. **Reply to a note**

(this functionality is not available yet)

Allow each apartment member reply to a note.

1. **Check notepad**

It can get all notes that is visible for the current users.

parameters: {user\_email, apt\_name}

return: status, {amount\_to\_settle(money, double), all\_notes\_list[author, descriptions, date]}

# Data Model

1. Account

account\_id, account\_name, user\_email\_list(list of user\_emails), expense\_id\_list(list of expense\_ids), user\_spendings\_list(list of money(double) spent or paid by each user)

(user\_spendings\_list may not be even ever because not every expense is shared by all the participants)

1. Expense

expense\_id(id), expense\_name(str), account\_id(id), item\_list(list of SpedingItems), cost(double), is\_settled(boolean), user\_list[](list of user\_ids), amount\_to\_settle[](list of double, positive means he needs to pay to settle this expense)

1. SpendingItem

item\_id(id), item\_name, user\_id, cost, date

1. User

user\_id, user\_email, user\_nickname, user\_profile\_url, account\_id, paypal\_account

1. Payment

from\_user\_id, to\_user\_id, amount\_of\_money, date, acknowledged(boolean)

1. Task
2. Notepad
3. Note