Architecture and Design Document

SplitSmart Application

CIS 376

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Introduction

Purpose

This document provides a full architectural interview of the software in a variety of different ways to show the full breadth of the system. This document will show all of the architectural decisions made in the system.

Scope

This document applies to the SplitSmart application co-developed by Ryan Klingensmith and Dominic Baughman.

Architectural Representation

This document presents the architectural representation as a series of views; use case view, logical view, deployment view, as well as size, performance, and quality. These views are presented as Rational Rose Models and use the Unified Modeling Language (UML).

Architectural Goals and Constraints

There are a few key requirements for the architecture of the system. These requirements are as follows:

- System should be able to handle predicted spikes in traffic
- The system will eventually be tracking real money transfers and needs to be able to interface with the software necessary to do so
- Both mobile and web app must be fully operational
- All other requirements in other documents must be taken into account

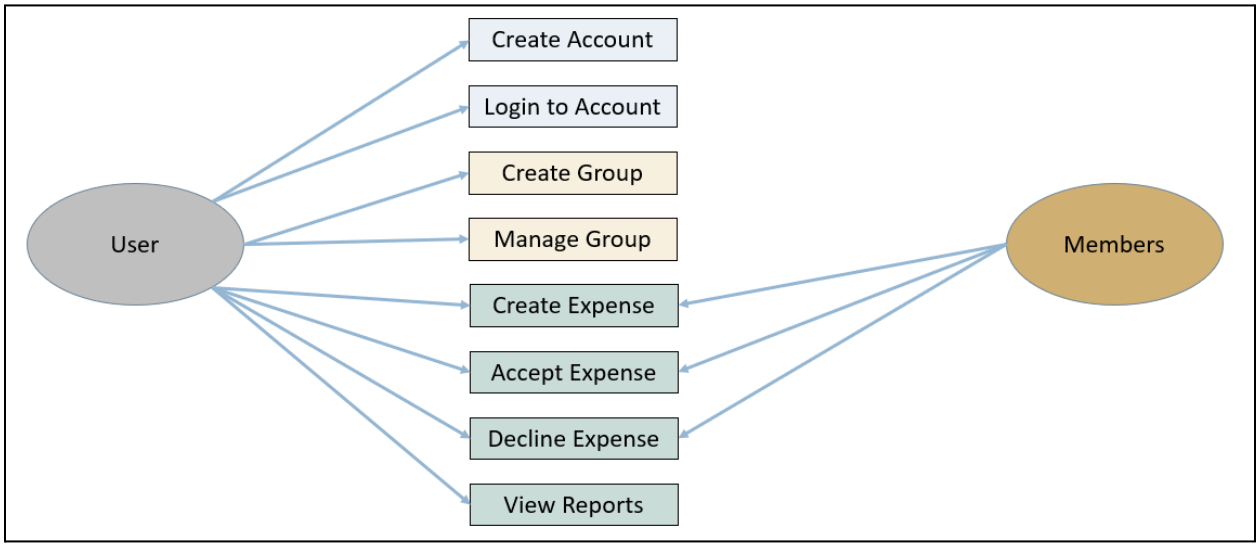
Use Case View

The following items are considered use cases for the SplitSmart application. Those that appear as underlined are significant to the architecture.

- Create User Account
- Login to User Account
- Create Group
- Manage Group
- Create Expense
- Accept Expense
- Decline Expense
- View Reports

Use Case Diagram

The following diagram represents the Use Cases for the SplitSmart application.



Significant Use Case Descriptions

- Create User Account
    - The "Create User Account" use case enables users to quickly and effortlessly register and establish their personal account within the SplitSmart application. They are prompted to enter their brief personal details and create login credentials. The user must create an account in order to login and use the application. Afterwards, the user will be able to input their new credentials to login to the application.
- Login to User Account
    - The "Login to User Account" use case allows registered users of the SplitSmart application to securely access their personal accounts by providing their login credentials. They are prompted to enter their account credentials in order to login to the application. The user must have a registered account within the SplitSmart application, and valid login credentials, including the registered email address or username and associated password. Upon successful login, the user gains access to their personal account in the SplitSmart application, enabling them to progress throughout and use the application as intended.
- Create Group
    - The “Create Group” use case allows users to create groups in which expenses can be shared between members. Users are prompted to enter the usernames of desired members or select them from a dropdown menu. Upon group creation, users will be able to create shared expenses and track payments within.
- Create Expense

    - The “Create Expense” use case allows users to create expenses and monitor corresponding payments within the desired group. Users can enter a description, total amount, applicable recipients, and adjust amounts owed by each party by either flat amounts or percentages. After creation, expenses will be subject to review and can either be accepted or declined by applicable parties.
- Accept Expense
    - The “Accept Expense” use case allows users to accept pending expenses created by other users and handle payments accordingly. After accepting expenses, the payment will automatically be processed and sent. Expenses that are both accepted and declined will be viewable and summarized within reports.

Logical View

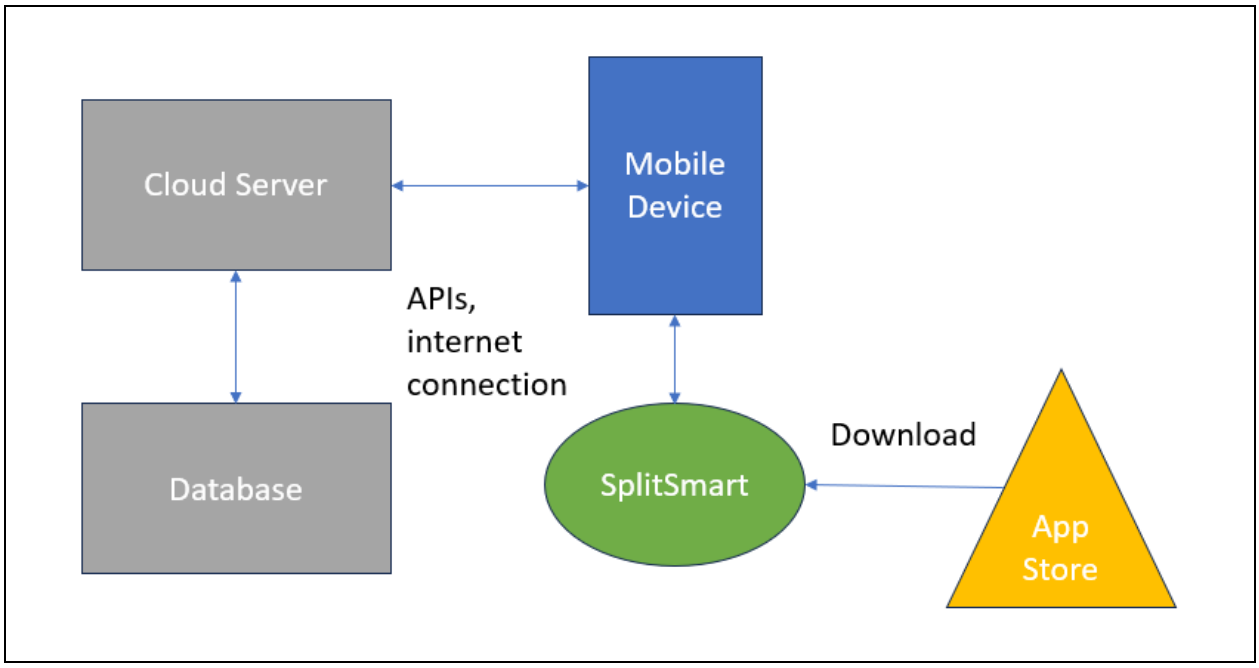
- “User” Class
    - Attributes
        - Username
        - Password
        - Email
        - Date of Birth
        - Address
        - Unit of Currency
        - Date Joined
    - Methods
        - createAccount()

        - logInAccount()
        - logOutAccount()
        - editProfile()
- “Group” Class
    - Attributes
        - Group Name
        - Group Members
        - Payment Ratios
        - Date Created
        - Notification Settings
    - Methods
        - createGroup()
        - manageGroup()
        - leaveGroup()
        - changeSettings()
- “Expenses” Class
    - Attributes
        - Amount
        - Description
        - Date
        - Status
        - Created By
        - Notes

        - Category/Type
    - Methods
        - createExpense()
        - acceptExpense()
        - declineExpense()
        - cancelExpense()

Deployment View

The following diagram represents the general deployment of the SplitSmart application and its corresponding software and hardware devices. The “mobile device” is any Android or iOS device with the ability to download and run applications; the “app store” represents the necessary hosting store where the SplitSmart application can be downloaded; the “cloud server” represents any hosting service where the SplitSmart infrastructure can be deployed; the “database” represents the central repository for storing and managing data required by the SplitSmart application.



Size and Performance

The SplitSmart application will be designed in a modular way that allows for easy and manageable scaling as necessary depending on the number of users and the total bandwidth required for constant, high-level operation and availability. While an exact estimate of desired possible users is currently unknown, we hope that 25,000 concurrent users will be able to utilize the SplitSmart application.

Quality

The software will be designed with high quality and functionality as the focal point of our development. Its performance in terms of functionality, performance, efficiency, usability, and resource allocation will be on par with or exceed common competitors currently on the market.