Android Application Design For Project 2

[Version 1.2]

This document is a hand-in of the course 18641. It describes design and part of implementation concerning our team's android application.

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System Overview

Many people, such as students in CMU, have to stay up late at night several days a week for works or other reasons. However, this kind of irregular lifestyle could cause many health problems. For example, adrenal cortex hormone is secreted during the time people are sleeping. Lack of regular sleep affects the secretion of adrenal cortex hormone, and further does harm to metabolism of carbohydrate and development of muscle in human body.

Our app aims at people who often stay up late, trying to help them reduce harm from irregular sleep. For those who can not adjust their sleep time but have to work at night, the app provides useful tips from official database and sharing information from other users. For those who have procrastination, the app is also integrated functions including sleeping statistic report, time reminder, phone addiction helper, and SNS synchronization monitor, etc. All users could choose to publish their sleep data at SNS platform, like facebook, with their friends. Users are thus expected to gradually form a better lifestyle with the help of the app.

The Nighty Bird application would collect user's sleep information and provide a report to user. It can also give user healthy advice periodically. User can set a time threshold that any time after that is late. The application could record how much time the user works late very every day and gives the user reminder when the user works very late or playing with cellphone too much in late night.

System in Context

The system's architect is easy. It consists several modules including collect user data, user sleep data, generate report, detect cellphone activity and give user reminders.

The basic module interaction is straightforward:

- A user profile module would store user's basic information like the user's nickname, gender and a picture
- A user sleep information collecting module that collects user's sleep time and wake up time
- A report generating module that generate reports for user and give user healthy advices

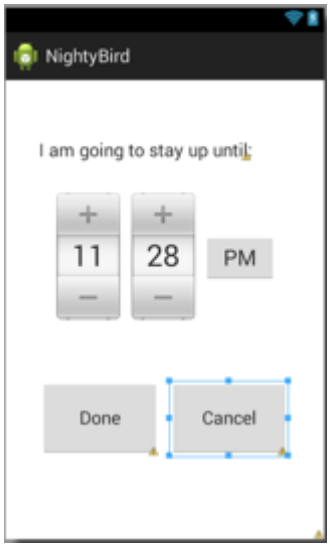
- A reminder service that when some conditions meet, the system would pops reminder to the user
- A cellphone activity detector that checks whether user is active or not

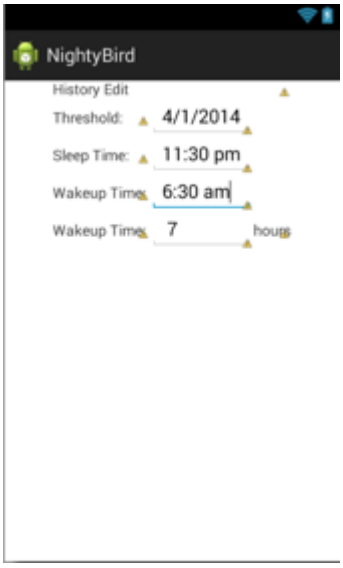
Advanced module includes:

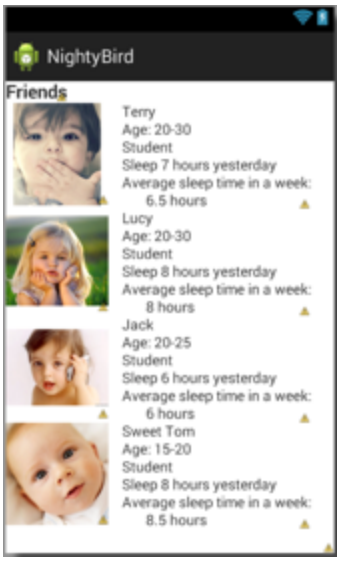
- A friend module help users manage and interact with their friends online.

Designing Screens

Figures below show the implementation of the screens.







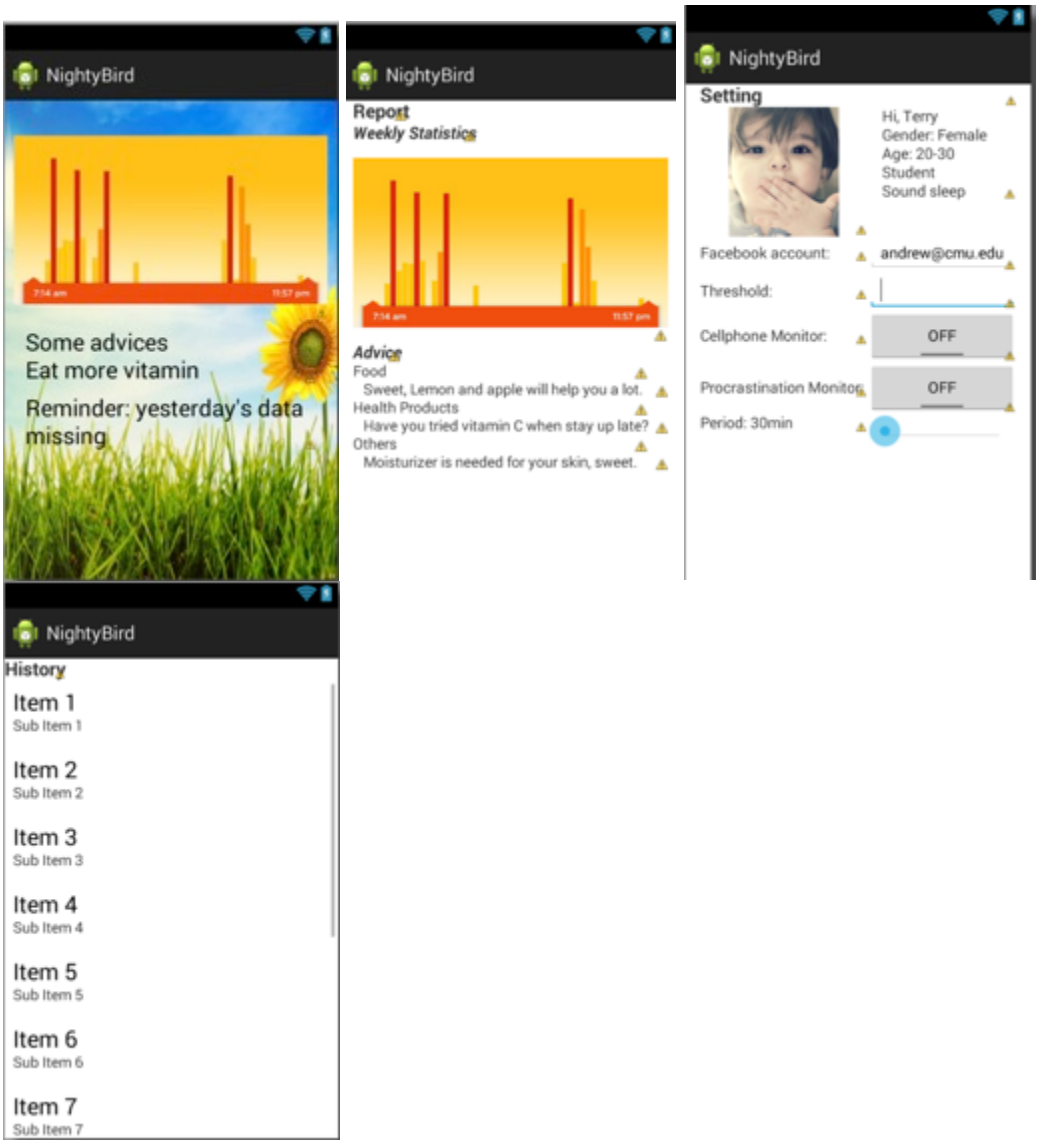


Figure 1： Implementation of wireframes

Designing Presentation Tier

Screenflow of the application has been designed as Figure 2. To support the switching of activities, intents and onClick mythods have been added to several activity classes (MainActivity, StayupActivity, etc).

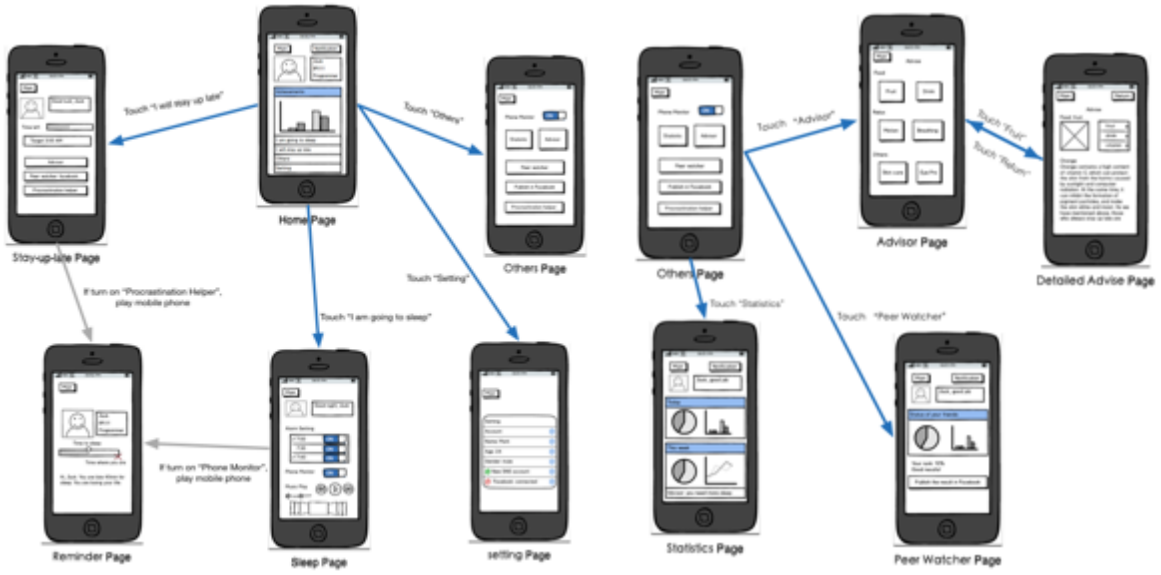


Figure 2： Screenflow of the application (**not including flows back to main page**)

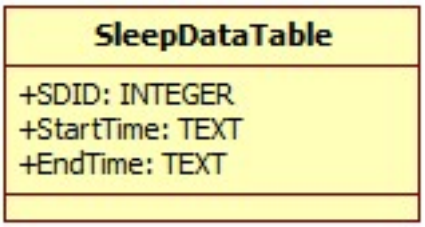
Designing Content Provider(For Storage)

Objects of database APIs are placed in package “dblayout”. SQLite DB will be used in the application to store data about sleeping.

The table goes as:

SleepDataTable		
SDID	INTEGER	PRIMARY KEY AUTOINCREMENT
StartTime	TEXT	NOT NULL
EndTime	TEXT	NOT NULL

The UML:



Designing Application Tier

Objects to be utilized in presentation tier are placed in package “entities”. There are four classes defined to realize functions in application tier:

Classs Name	Type	Functions
Report	abstract class	API for extending types of reports
DailyReport	class, extends Report	Report class for daily report data
WeeklyReport	class, extends Report	Report class for weekly report data
ReportManager	class	Manage various types reports: getting and storing reports; anlyzing reports; publishing reports online.

Designing Integration Tier

Objects to interact with applications on same device are placed in package “ws.local”; objects to interact with remote services are placed in package “ws.remote”.

Design of classes in package “ws.local”:

Classs Name	Type	Functions

StayupReminder	class	sendReminder methods: to remind for sleeping time

Design of classes in package “ws.remote”:

Classs Name	Type	Functions
Friend	class	Define the data structure of friends that users have.
FriendsInteractor	class	Include methods to get, delete, update, interact with friends via remote server.