

Ho Chi Minh City University of Technology  
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



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Report

# Practice on Software Engineering

## Lifestyle Monitoring App

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**Lecturer:** Dr. Quan Thanh Tho

**Student:** **GROUP 18**  
Do Anh Khoa – 1852471  
Vu Hoang Anh Khoi – 1811013  
Bui Minh Kiet - 1852115  
Dang Gia Le - 1812791  
Nguyen Hoang Long - 1852164

## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Functional Requirements</b>	<b>3</b>
2.1	Basic funtions . . . . .	3
2.2	Use-case diagram for whole system . . . . .	4
<b>3</b>	<b>Use-cases description</b>	<b>5</b>
3.1	Do Anh Khoa: Security . . . . .	6
3.1.1	Password . . . . .	6
3.1.1.a	Use-case details . . . . .	6
3.1.1.b	User story . . . . .	6
3.1.1.c	Main flow . . . . .	7
3.1.1.d	Mock-up . . . . .	8
3.1.2	Biometric . . . . .	9
3.1.2.a	Use-case details . . . . .	9
3.1.2.b	User Story . . . . .	9
3.1.2.c	Main Flow . . . . .	9
3.1.2.d	Mock-up . . . . .	10
3.2	Bui Minh Kiet: Receive Advice and Notification . . . . .	10
3.2.1	Use-case details . . . . .	11
3.2.2	User story . . . . .	11
3.2.3	Main flow . . . . .	12
3.2.4	Mock-up . . . . .	13
3.3	Vu Hoang Anh Khoi: Manage personal schedule . . . . .	14
3.3.1	Use-case details . . . . .	14
3.3.2	User story . . . . .	14
3.3.3	Main flow . . . . .	15
3.3.4	Main flow . . . . .	16
3.4	Dang Gia Le: Manage Personal Status . . . . .	16
3.4.1	Use-case details . . . . .	17
3.4.2	User story . . . . .	17
3.4.3	Main flow . . . . .	18
3.4.4	Mock-up . . . . .	19
3.5	Nguyen Hoang Long: Search Information . . . . .	20
3.5.1	Use-case Details . . . . .	21
3.5.2	User story . . . . .	21
3.5.3	Main flow . . . . .	22
3.5.4	Mock-up . . . . .	23
3.6	Bui Minh Kiet: Receive Advice and Notification . . . . .	24
3.6.1	Use-case details . . . . .	24
3.6.2	User story . . . . .	24
3.6.3	Mock-up . . . . .	25
<b>4</b>	<b>Software Architecture: Deployment Diagram</b>	<b>26</b>
<b>5</b>	<b>Software Design: Class Diagram</b>	<b>27</b>
<b>6</b>	<b>Conclusion and development strategy</b>	<b>28</b>



## Document History

Date	Version	Changes	Changed by
19/04/2020	1.0	- Create report template - Present Introduction	Do Anh Khoa
20/04/2020	1.1	- Describes basic functions - Usecase for function "Receive Advice"	Bui Minh Kiet
21/04/2020	1.2	- Usecase for function "Manage Personal Schedule"	Vu Hoang Anh Khoi
21/04/2020	1.3	- Usecase for function "Manage Personal Status"	Dang Gia Le
21/04/2020	1.4	- Usecase for function "Export Document"	Do Anh Khoa
21/04/2020	1.5	- Usecase for function "Search Information"	Nguyen Hoang Long
27/04/2020	2.0	Detailed description for <i>Export Personal Document</i> - Initialization and detailed description for <i>Change Settings</i>	Do Anh Khoa
27/04/2020	2.1	- Detailed description for <i>Receive Advice &amp; Notification</i>	Bui Minh Kiet
27/04/2020	2.2	- Detailed description for <i>Manage personal schedule</i>	Vu Hoang Anh Khoi
28/04/2020	2.3	- Detailed description for <i>Manage Personal Status</i>	Dang Gia Le
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28/04/2020	2.5	- Update Use-case diagrams	Bui Minh Kiet
28/04/2020	2.6	- Add mock-up and workflows for respective feature	Whole group
10/05/2020	2.7	- Update Use-case diagram and Activity diagram for <i>Manage personal schedule</i>	Vu Hoang Anh Khoi
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23/07/2020	3.1	- Update mock-ups for manage personal status	Dang Gia Le
24/07/2020	3.2	- Update Manage Schedule + Notification/ Reminder (mockup + descriptions)	Vu Hoang Anh Khoi
24/07/2020	3.3	- Update Mockups for Home screen, Display and Advice	Bui Minh Kiet
29/07/2020	3.4	- Add class diagram and deployment diagram	Bui Minh Kiet
30/07/2020	3.5	- Finalize report and polish works	Whole group



## 1 Introduction

With the advance of technology, people's lifestyle are becoming more and more convenient with the use of smart applications. One of the problems people usually encounter with nowadays is keeping track of their daily activities and personal status, as well as receiving healthy and useful advice to maintain a satisfactory condition. Therefore, the need of developing a convenient monitoring software is reasonable.

Lifestyle app is a simple interactive mobile application that helps users preview, program and improve their lifestyle. The app provides a mean of recording financial, physical and nutritional status and in return also gives general advice on proper decisions in spending and eating. Furthermore, the database of basic meals and workouts available can also aid users in searching and looking for options daily.

This report serves as the second outline of our group's project on the course *Practice on Software Engineering (CO3055)*. The report presents a Use-case diagram for the whole system along with detailed description on some major use-cases, depending on each member's work. The description will include details/ scenario, user story, mock-ups image and workflow.

The mock-ups images presented are drawn by the group using an online website called [app.mockups.com](http://app.mockups.com), while workflows are created with the help of online sites such as [draw.io](http://draw.io), [lucidchart](http://lucidchart.com),...

## 2 Functional Requirements

### 2.1 Basic funtions

In order to allocate and distribute the group work, we have discussed and agreed on five basic functions of the Lifestyle app. Noted that these functions can include and extend to other more subtle features and are subject to be modified in the near future as the software develops.

1. **Manage Personal Status:** Allow user to enter and modify personal information such as daily spending, meals, activities as well as financial status and physical conditions. This information is stored as user's profile and can be reviewed any time.
2. **Manage Personal Schedule:** User can set up their own itinerary consisting of useful reminders, meeting and quick notes. These schedules are monitored and alerted via the use of push notification.
3. **View suggestion information:** The app is projected to allocate a database of basic kinds of food in Vietnam with detailed nutritional value, as well as various suggested workout and exercises. User can either browse, search or filter the available suggestion to help find the best plan for their schedule.
4. **Receive advice and notification:** An advanced feature of the app is generating personal advice according to the personal status entered by the user. This includes suggesting daily plans and alerting when user's lifestyle is getting off track.
5. **Export Personal Document:** Generate documents under the form of pdf about user's personal condition. These can be used as a helpful summary or be submitted to personal trainers and the authority when in need. In addition, visual graphs and charts can be presented to help illustrate the information more conveniently.
6. **Change Settings:** Perform simple modification on app usage, including changing personal data and setting lock code (local use).

## 2.2 Use-case diagram for whole system

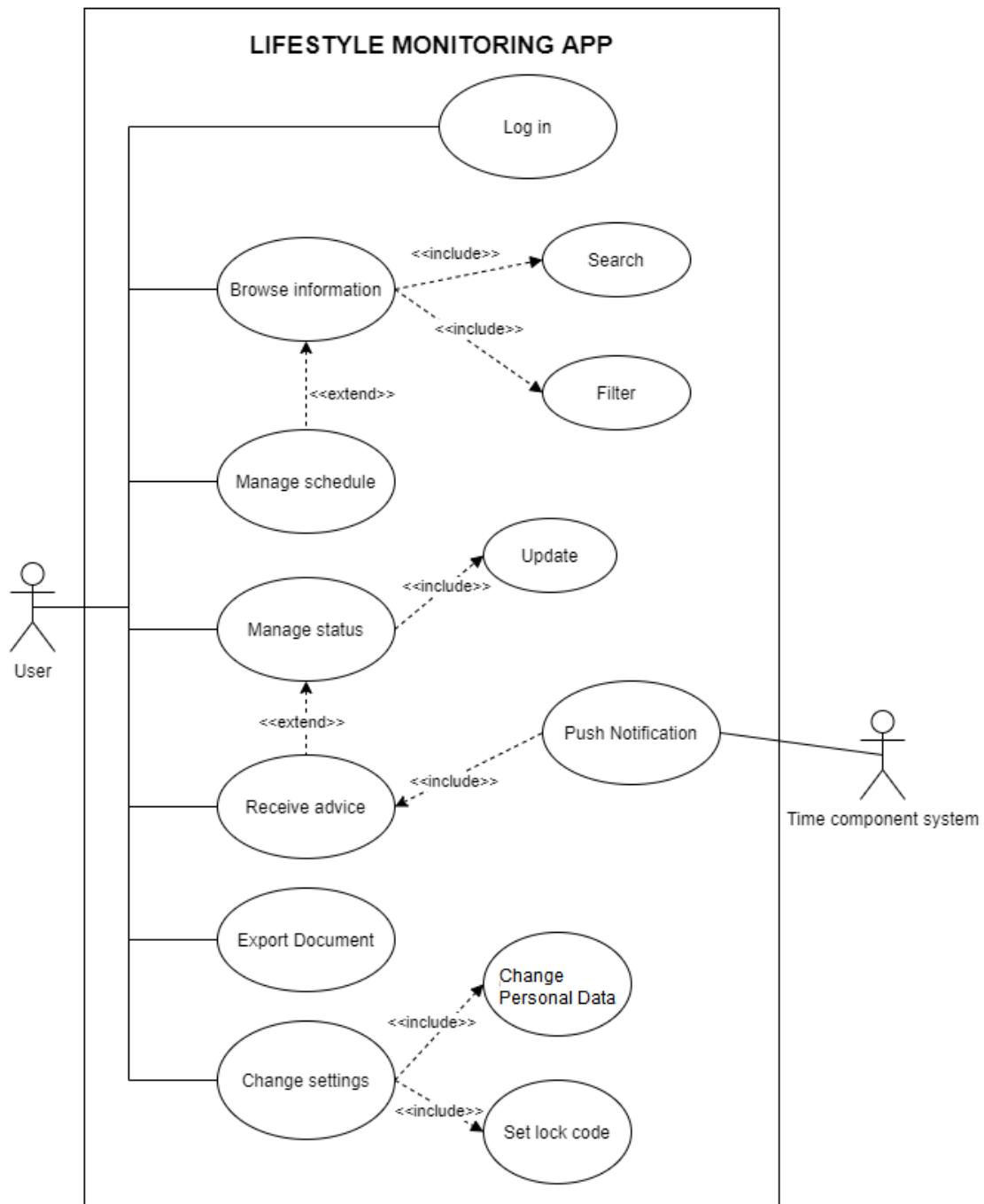


Figure 1: Use-case diagram for whole system

### 3 Use-cases description

This section will present the details of the some major interaction use-case with the system. In each part, the detailed table of the use case will be listed. In addition, user story, main flow and a mock-up screen of what the expected app interface will look are also documented.

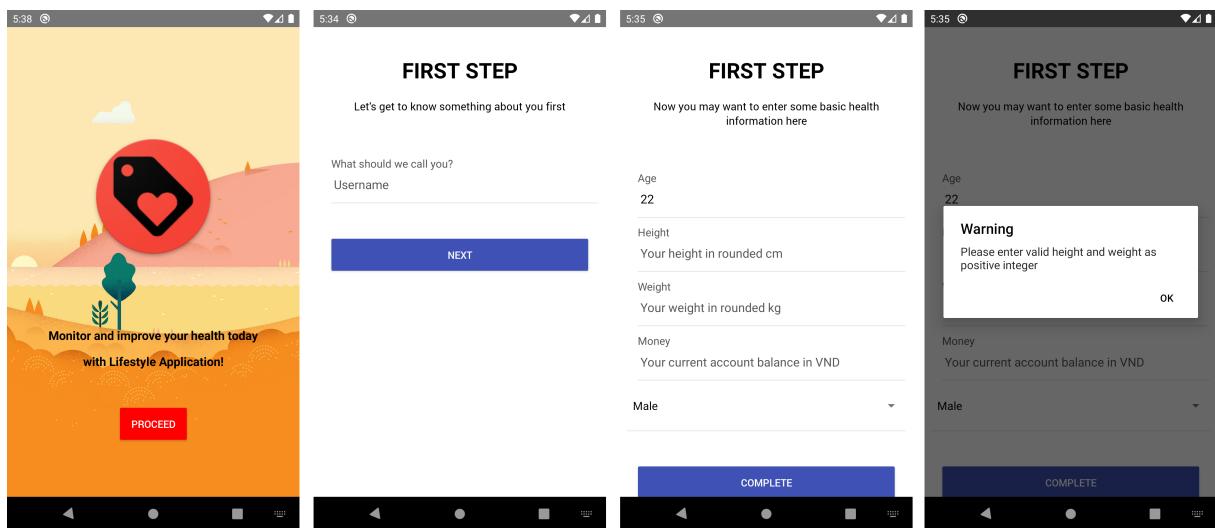


Figure 2: Splash screen and first user form screen upon installing the app

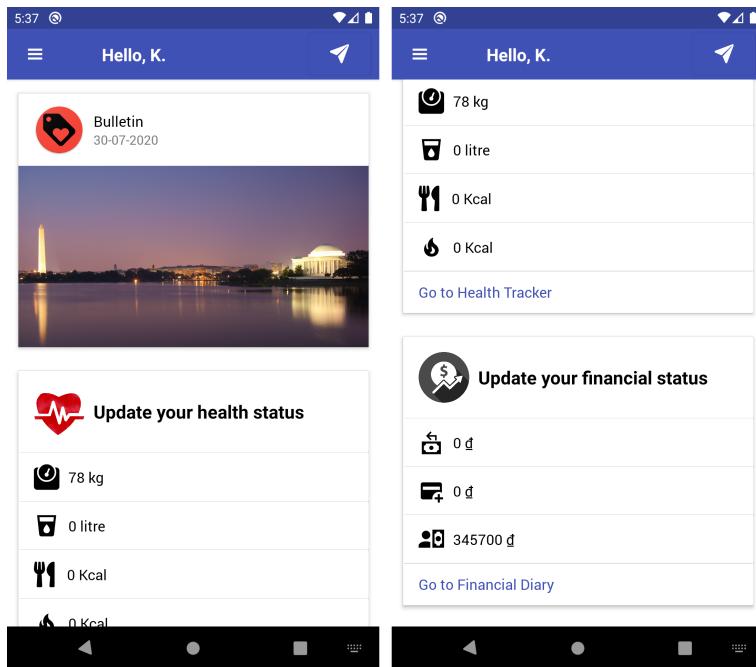


Figure 3: Home Screen User Interface after registering

### 3.1 Do Anh Khoa: Security

#### 3.1.1 Password

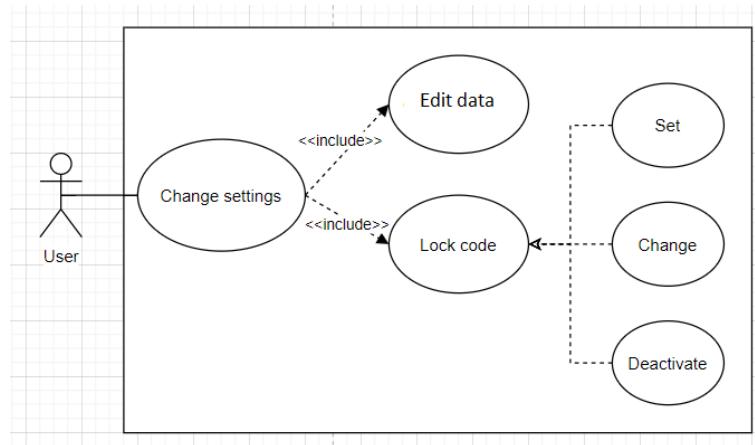


Figure 4: Use case diagram for security (Do Anh Khoa) and editing personal data (Bui Minh Kiet)

##### 3.1.1.a Use-case details

Use case name	Set Lock Code
Actor	Users
Description	User can set private lock code for the app.
Trigger	User wants to make this app safer and more personal
Precondition	Users is at the Option tab of the application
Normal flow	1. User chooses set lock code in Change Setting tab. 2. User register pin code for the app. 3. System set up password for the app.
Exceptions	None
Alternative flow	<i>Alternative 1: at step 2</i> 3a. If Set Lock Code is already on, one click will deactivate lock code. 3b. System reask pin code for confirmation. 3c. System process deactivation request.

##### 3.1.1.b User story

- User might also want to make this app more personal to them. By setting lock code, it can prevent other people who have access to the phone from entering the app and intrude data in the app.

### 3.1.1.c Main flow

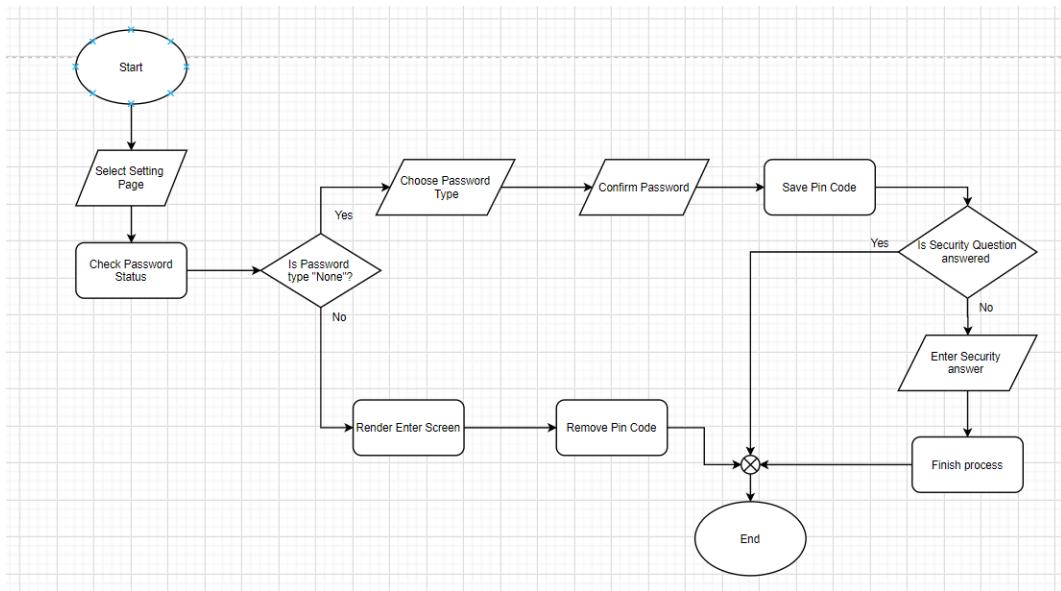


Figure 5: Main flow for Setting Security

### 3.1.1.d Mock-up

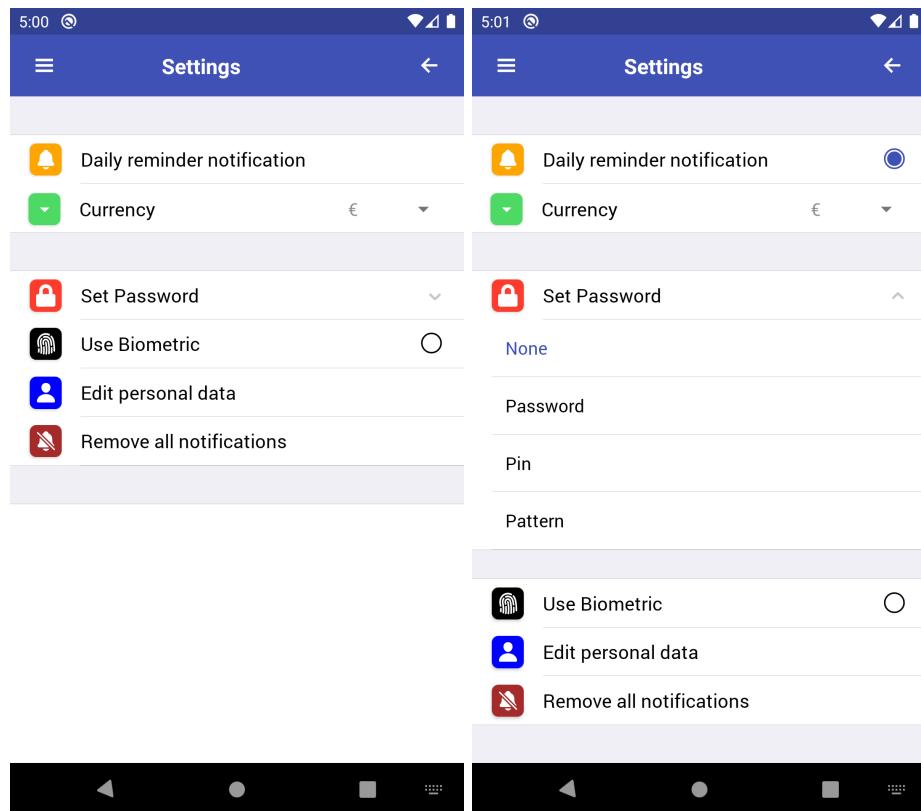


Figure 6: Setting Page

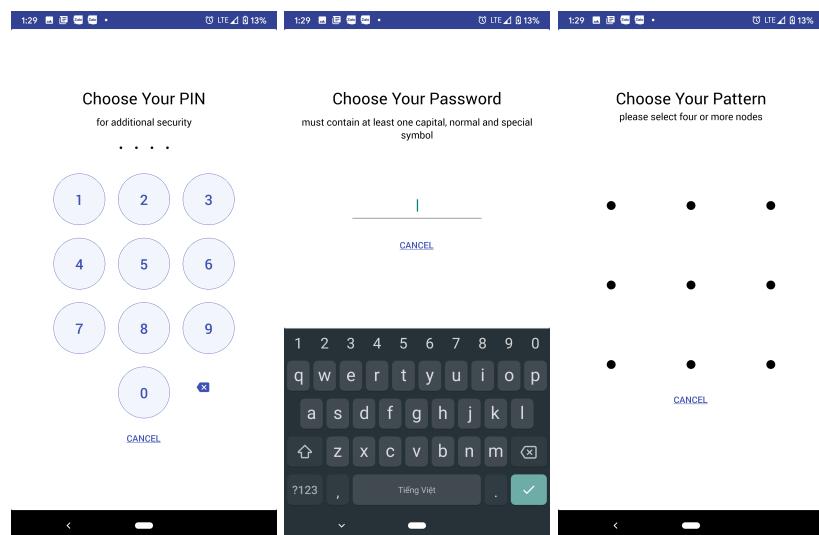


Figure 7: Type of password

### 3.1.2 Biometric

#### 3.1.2.a Use-case details

Use case name	Set Lock Code
Actor	Users
Description	User can set biometric (fingerprint) for the app.
Trigger	User wants to make this app safer and more personal
Precondition	User's device have biometric hardware, a fingerprint has been set in the system
Normal flow	1. User chooses Biometric in Change Setting tab. 2. User authenticate using registered fingerprint to turn on. 3. System set up turn on biometric authentication for the app.
Exceptions	Device does not support hardware or fingerprint has never been set.
Alternative flow	<i>Alternative 1: at step 2</i> 3a. If biometric is already on, one click will deactivate lock code. 3b. System ask for fingerprint confirmation. 3c. System process deactivation request.

#### 3.1.2.b User Story

-User's device have Biometric system and they wish to use that as their main security system.

#### 3.1.2.c Main Flow

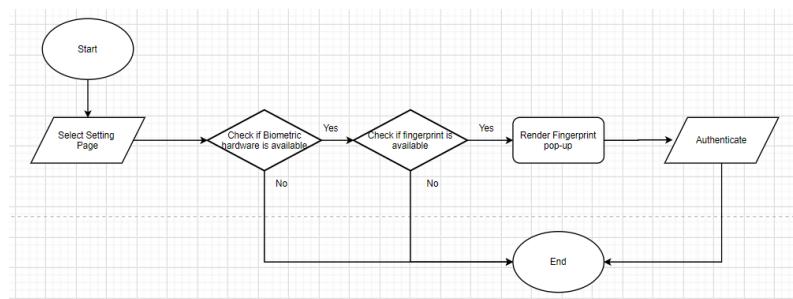


Figure 8: Type of password

### 3.1.2.d Mock-up

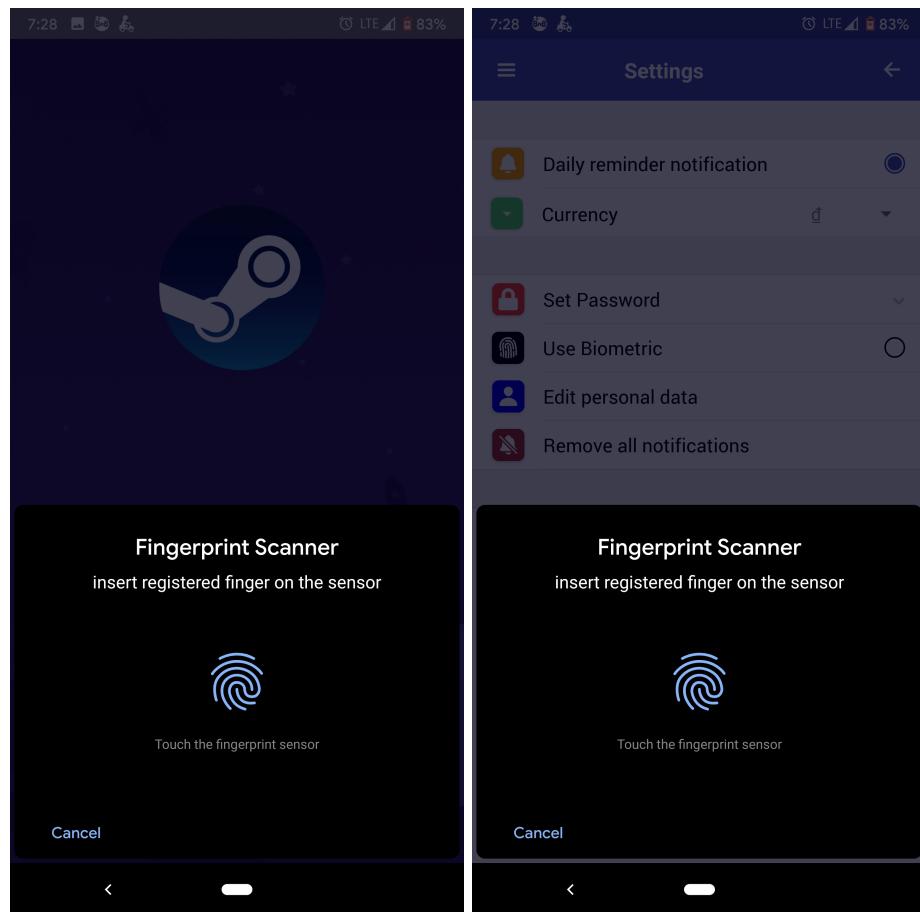
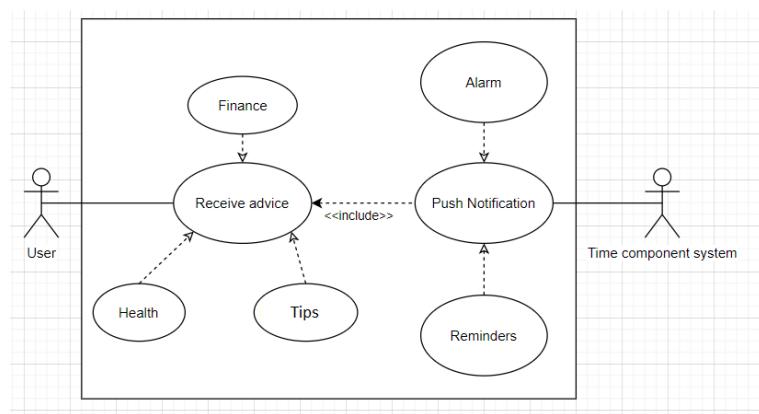


Figure 9: Setting Page

## 3.2 Bui Minh Kiet: Receive Advice and Notification



### 3.2.1 Use-case details

Use case ID	4
Use case name	Receive Advice & Notification
Actor	User, Time management system
Description	At specific time of the day, the app will automatically generate advice based on tracked user information. The advice can also be manually generated at any time if user choose the option to receive it.
Trigger	User command or device's time system notification
Precondition	User is at the <i>Options</i> tab generated from the home page
Normal flow	<ol style="list-style-type: none"> <li>1. User chooses "<i>Today's advice</i>" in the <i>Option</i> tab</li> <li>2. System presents a list of sections (health advice, financial advice,...) for user to choose from</li> <li>3. User selects option(s) from the list</li> <li>4. Based on user's choices and personal information available, the app will present advice and suggested schedule for user</li> <li>5. After that, system may present warning and reminders for the day if user has any</li> </ol>
Exceptions	<p><i>Exception 1: at step 2</i>  If the user has not entered any personal data regarding the section(s) chosen, system asks user to enter some basic information first</p>
Alternative flow	<p><i>Alternative 1: at step 1</i></p> <ol style="list-style-type: none"> <li>1a. User does not ask for advice, but the time system alerts automatic daily advice or events</li> <li>1b. System generates advice / events with user's most recent status and schedule as data</li> <li>1c. System creates messages and push these to user's device screen</li> </ol> <p><i>Jump to step 4 in normal flow</i></p>

### 3.2.2 User story

- User wants to improve health condition and raise awareness of their own lifestyle. By using the app, they seek to receive more analysis and advice on their personal status, and as a result know how to organize/ function their life better. Moreover, timely warning on unusual trends in their health or spending can prove to be critical to have, especially in situations when users are too busy to notice these irregularities.
- User has entered their personal data into the app daily, and has also tried some suggested exercises & habits presented in the app. Now they want to receive some quick analysis and advice on their condition, so they use the "*Receive Advice*" option in the application. The app presents calculated measures and general insights or warnings based on built-in algorithms. User can choose to use these insights to improve their itinerary and build a better life.
- Moreover, the time system can also interact with the app by pushing notification, either about new advice or maybe just daily reminders and notes, to user's device screen.

### 3.2.3 Main flow

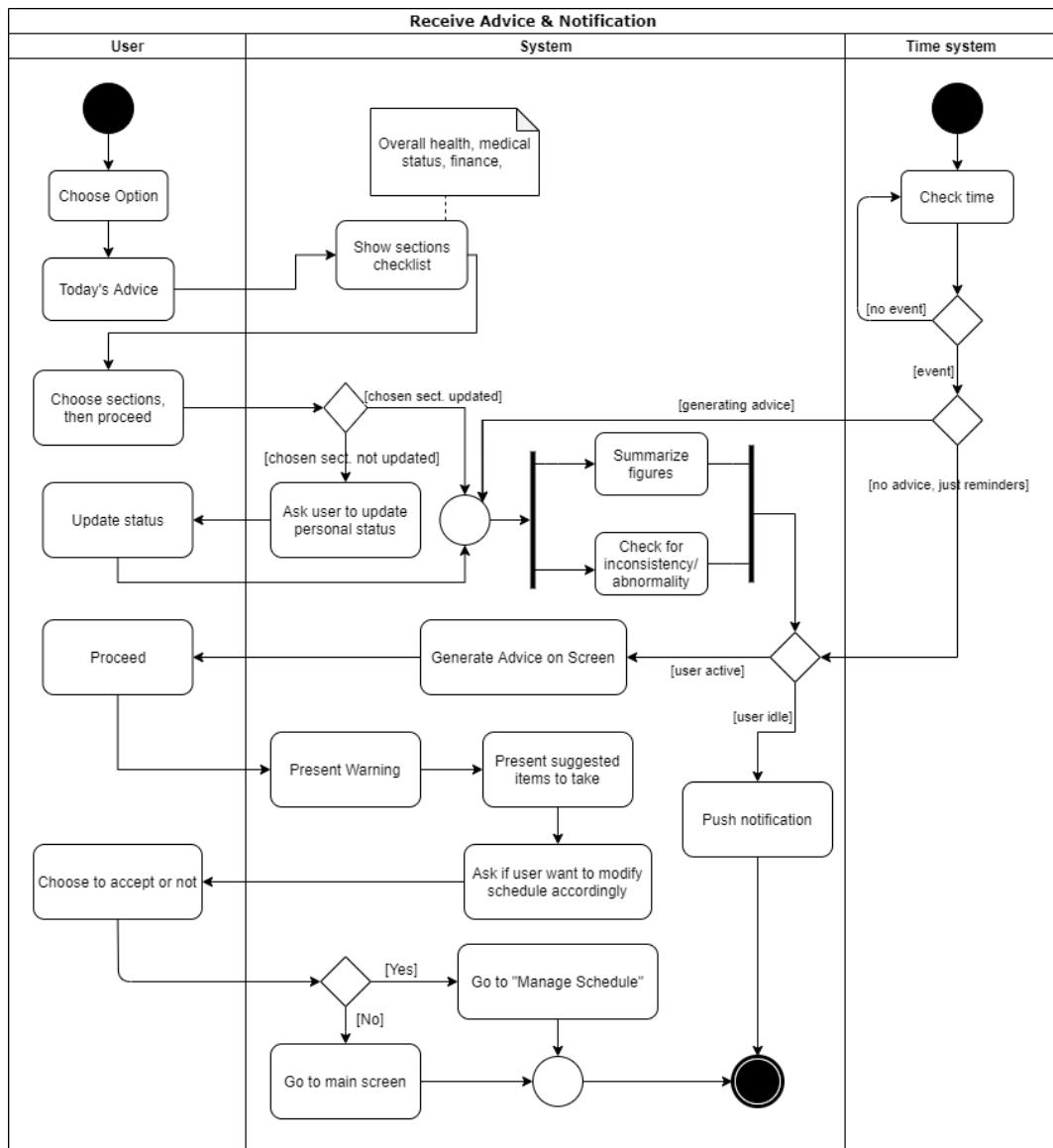


Figure 10: Main flow for receiving advice and notification

### 3.2.4 Mock-up

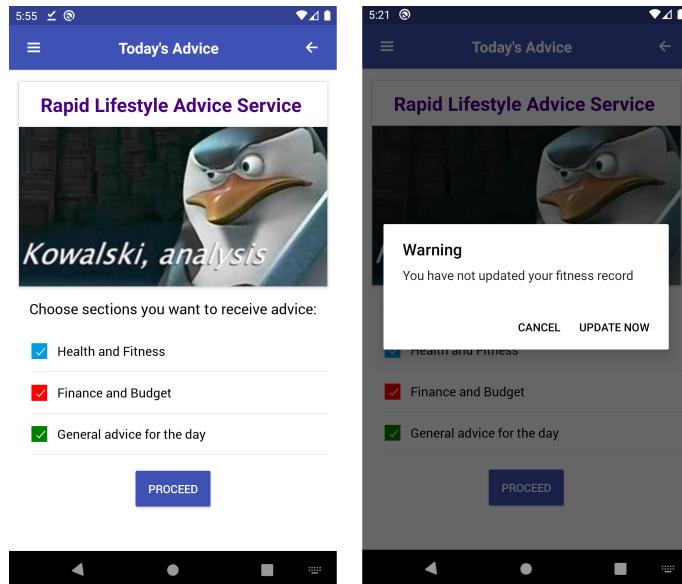


Figure 11: Mock-up screen for pre-filling in advice screens

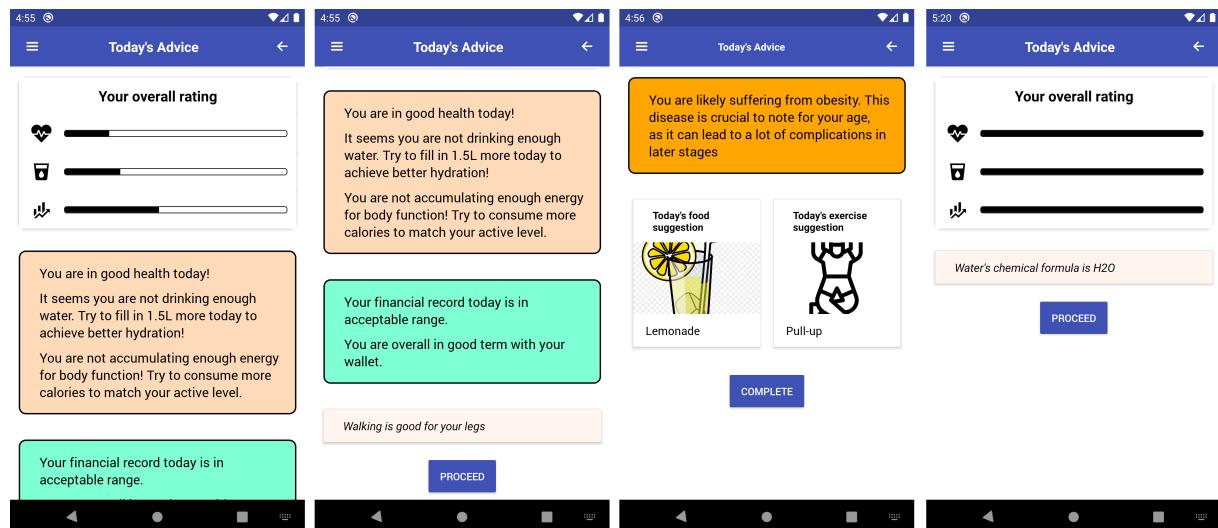
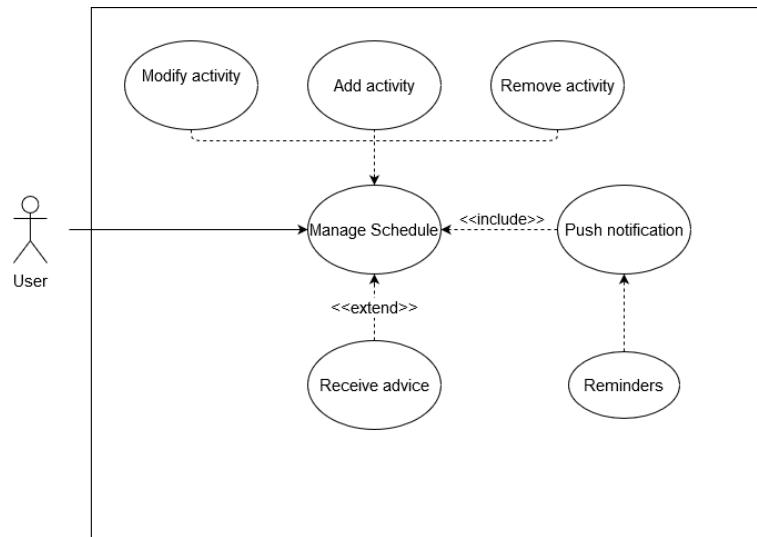


Figure 12: Mock-up screen for advice analysis and warning

### 3.3 Vu Hoang Anh Khoi: Manage personal schedule



#### 3.3.1 Use-case details

Use case ID	2
Use case name	Manage personal schedule
Actor	User
Description	User will set some activities with specifications so that the system will record and remind the user when the time comes.
Trigger	User's choice
Precondition	User should add some activities first
Normal flow	1. User chooses "Schedule" to manage the activities. 2. Initially there is empty, user taps the "+" sign to add activity and set information such as name, duration for it. 3. The system uses the schedule to notify user whenever there is an activity arranged at that time and when to stop.
Exceptions	<i>Exception in step 2:</i> User may not add any item to the schedule. Then the system will automatically send a message to suggest user to come to "Today's advice".
Alternative flow	<i>Alternative in step 3:</i> User may tackle unexpected problems at that time and tap "Postpone". Then the system will send a notification to remind the user of the activity.

#### 3.3.2 User story

- User aims to have a healthier lifestyle. They want to be reminded exact and reasonable time and duration for an activity. So the user create a schedule for a day by using the schedule management feature of the app.
- User can easily add up new activity by tapping the plus "+" sign and the feature will support him/her with changing days in week, start and end time, and the title of the activity.

### 3.3.3 Main flow

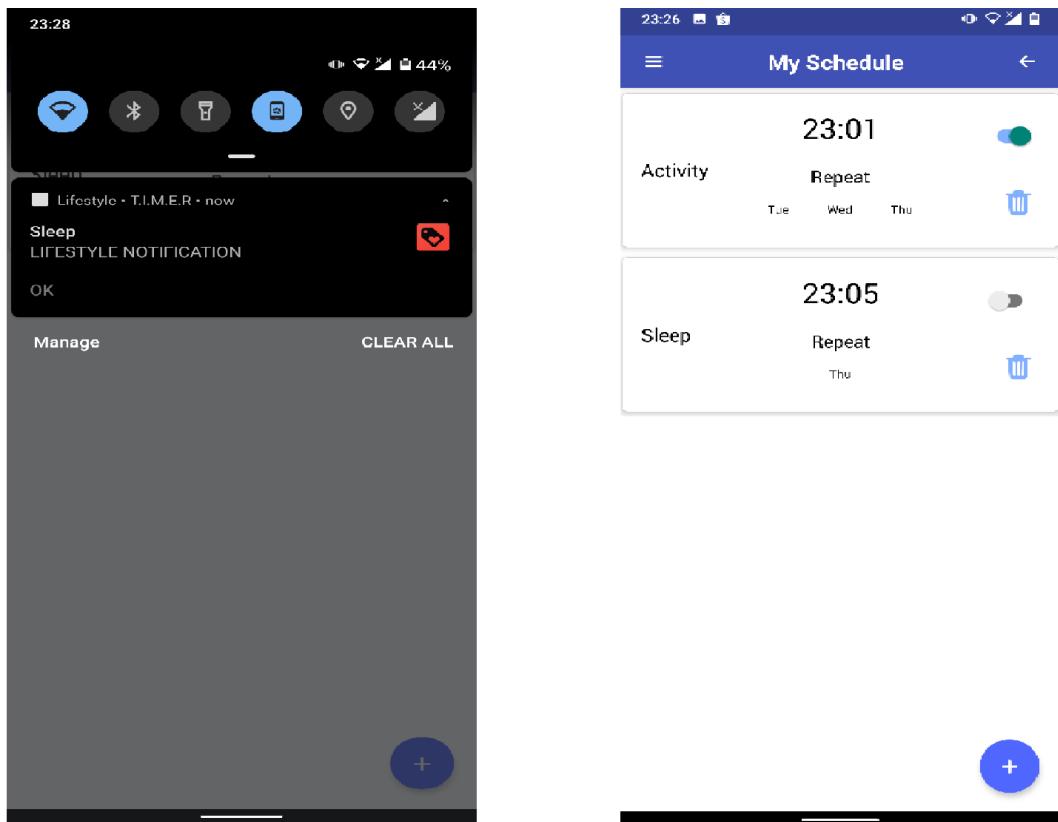


Figure 13: Main flow for Manage Schedule

### 3.3.4 Main flow

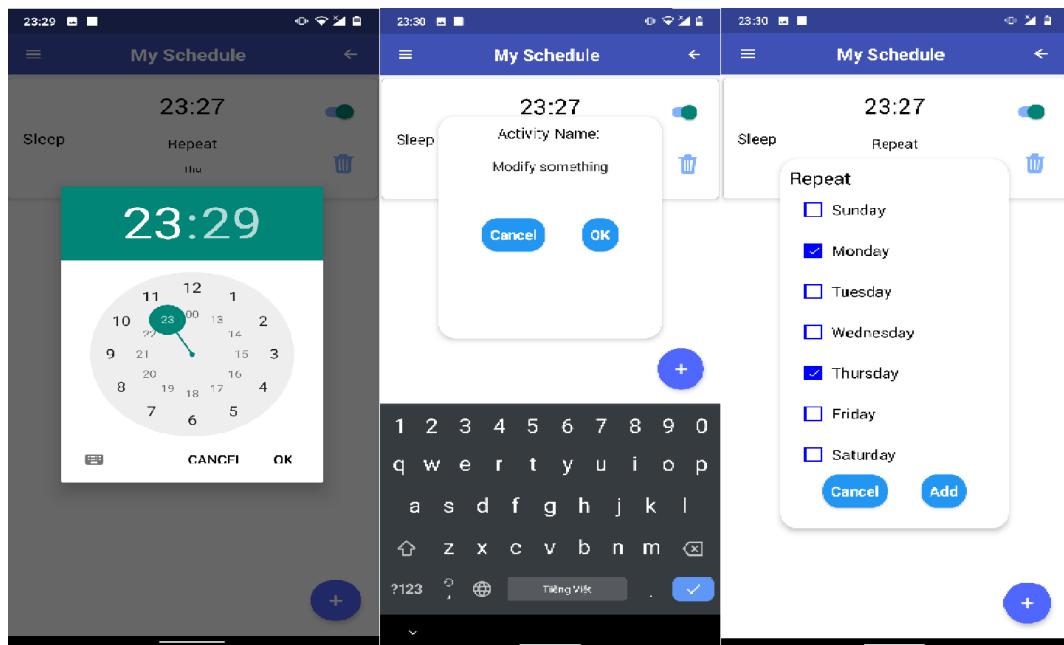
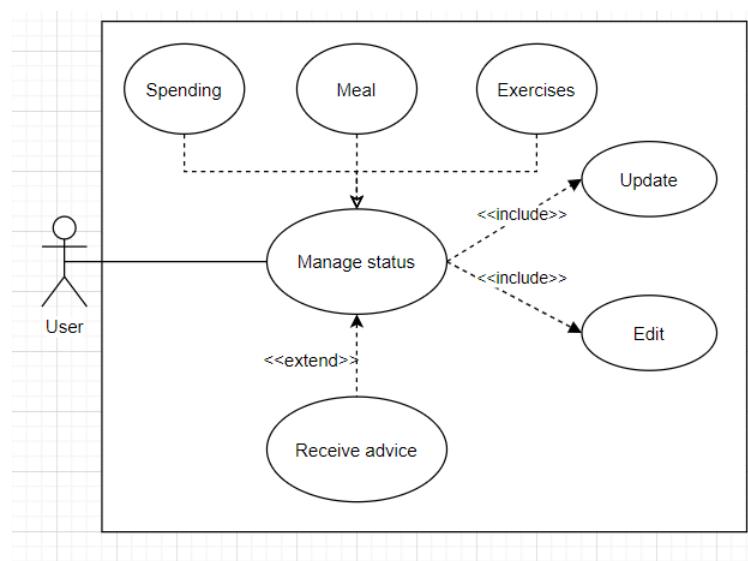


Figure 14: Main flow for Manage Schedule

### 3.4 Dang Gia Le: Manage Personal Status



### 3.4.1 Use-case details

Use case ID	1
Use case name	Manage Personal Status
Actor	User
Description	User enter daily personal information such as spending, exercises, meals to track user's budget and health
Precondition	User is at the main tab for input personal status
Normal flow	<ol style="list-style-type: none"><li>1. User chooses "Tracker" tab</li><li>2. App will present a list of types of information needed to be tracked</li><li>3. User chooses type from the list to enter required information</li><li>4. Data input will be stored in the system and then present in "Personal Status" tab</li><li>5. User can view daily status in "Personal Status" tab.</li></ol>
Exceptions	<p><i>Exception 1 at step 3:</i> If user does not press the submit button, the data will not be stored in the system.</p> <p><i>Exception 2 at step 4:</i> User enters wrong information. It is possible for user to edit or delete the data</p>
Alternative flow	<p><i>Alternative 1 in step 1:</i> At certain time of night, if user has not entered data yet, the system will send a notification to remind user</p>

### 3.4.2 User story

User want to track their daily personal status (including spending, meal, exercise) in order to adjust to a healthy good lifestyle and receive daily appropriate advice.

### 3.4.3 Main flow

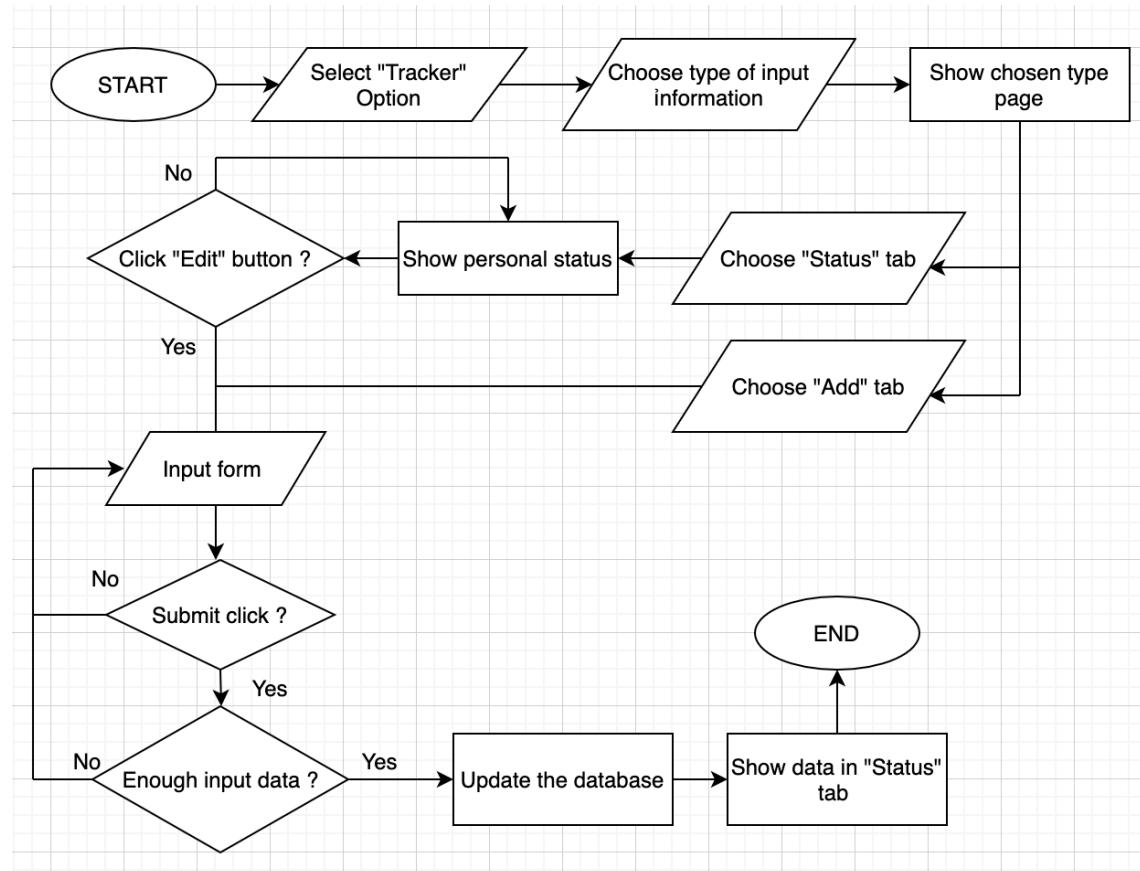


Figure 15: Main flow for Manage Personal Status

### 3.4.4 Mock-up

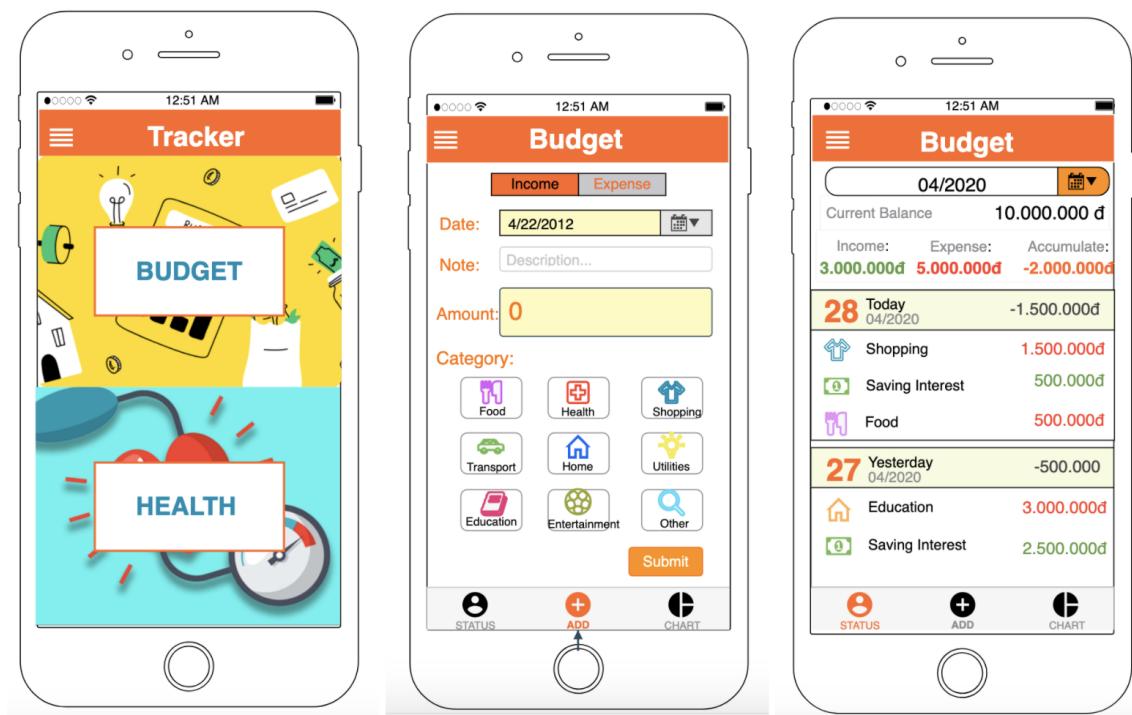


Figure 16: Mock-up screen for Manage Personal Status

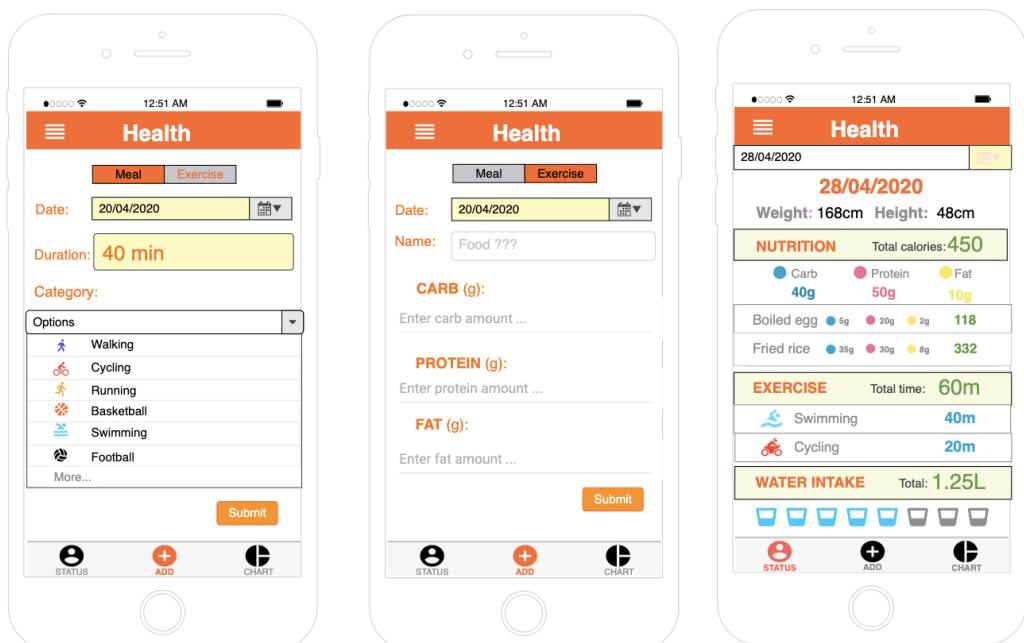
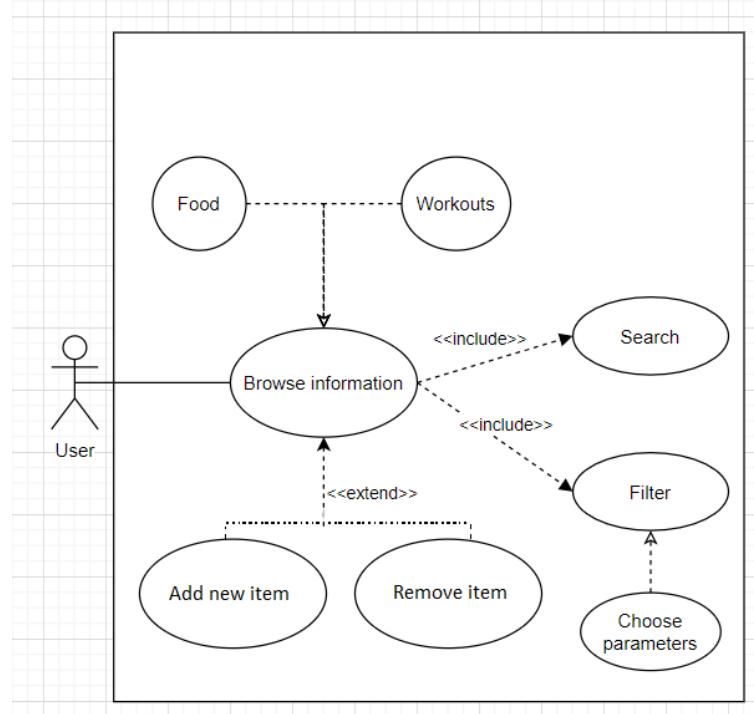


Figure 17: Mock-up screen for Manage Personal Status

### 3.5 Nguyen Hoang Long: Search Information



### 3.5.1 Use-case Details

Use case ID	3
Use case name	Search Information
Actor	User
Description	The app's database allows user to browse, filter and search for food and exercises with details to consider. User may choose to add the data into his/ her own schedule.
Trigger	User command to enter searching option.
Precondition	User is at the Option tab of the application.
Normal flow	<ol style="list-style-type: none"><li>1. User chooses Suggest Food/ Exercises in the <i>Option</i> tab.</li><li>2. System presents a list of food/ exercise available in the database in alphabetical order</li><li>3. User may browse and choose on a certain item in the list</li><li>4. System presents the item detailed description</li><li>5. User may choose to add the item in schedule and/ or "favorite" tab</li><li>6. System registers the chosen item into schedule and/ or "favorite" tab</li></ol>
Exceptions	<p><i>Exception 1: at step 5</i></p> <ol style="list-style-type: none"><li>2a. User's schedule at the chosen time has already been allocated</li><li>2b. System asks for rescheduling or canceling the option</li></ol>
Alternative flow	<p><i>Alternative 1: at step 3</i></p> <ol style="list-style-type: none"><li>3a. User chooses to use Filter</li><li>3b. System presents a list of parameters used for filtering items</li><li>3c. User chooses the parameters and tap Proceed</li><li>3d. System presents the item list based on user's chosen parameters</li></ol> <p><i>Alternative 2: at step 3</i></p> <ol style="list-style-type: none"><li>6a. User chooses to use Search.</li><li>6b. System presents a Search bar and a keyboard for user to type</li><li>6c. User enters desired information and tap Proceed</li><li>6d. System presents the item list based on user's information</li></ol>

### 3.5.2 User story

- User wants to have reference on some good food and exercises to take, and by browsing the data from the app, user can select and organize their own schedule with these items.

### 3.5.3 Main flow

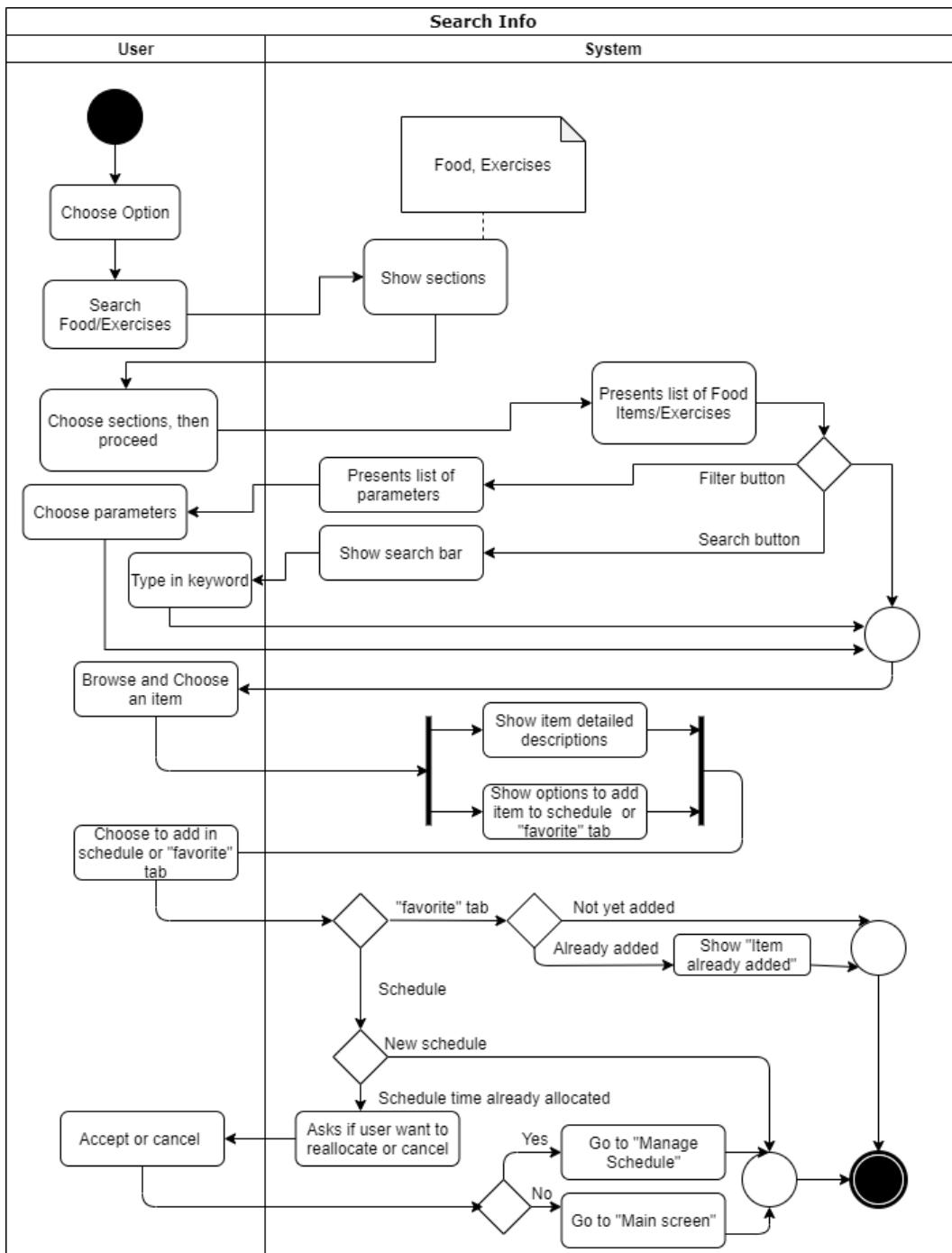


Figure 18: Main flow for searching information

### 3.5.4 Mock-up

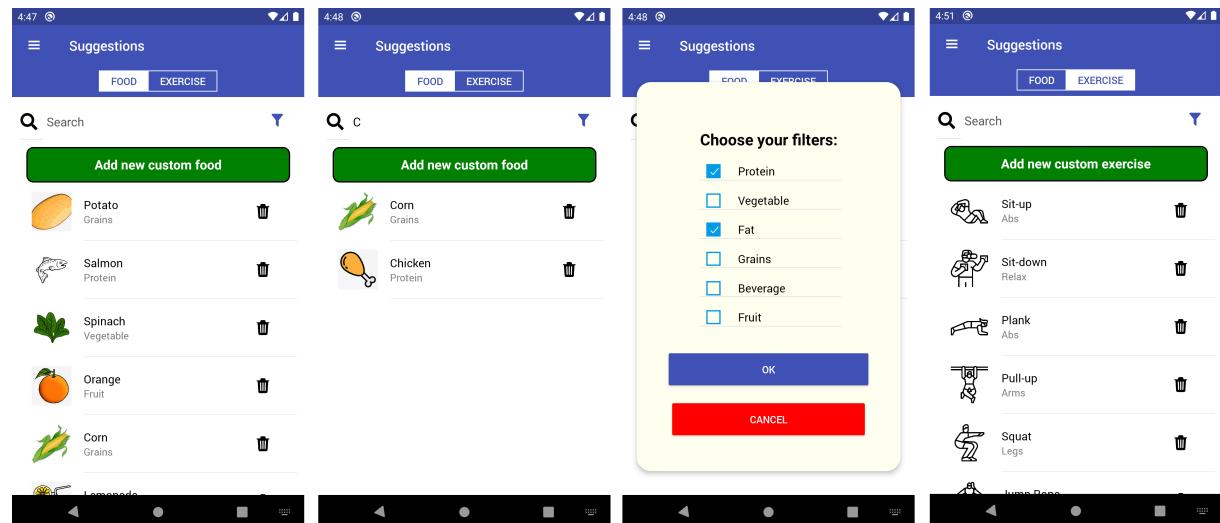


Figure 19: Mock-up screens for viewing / searching / filtering items

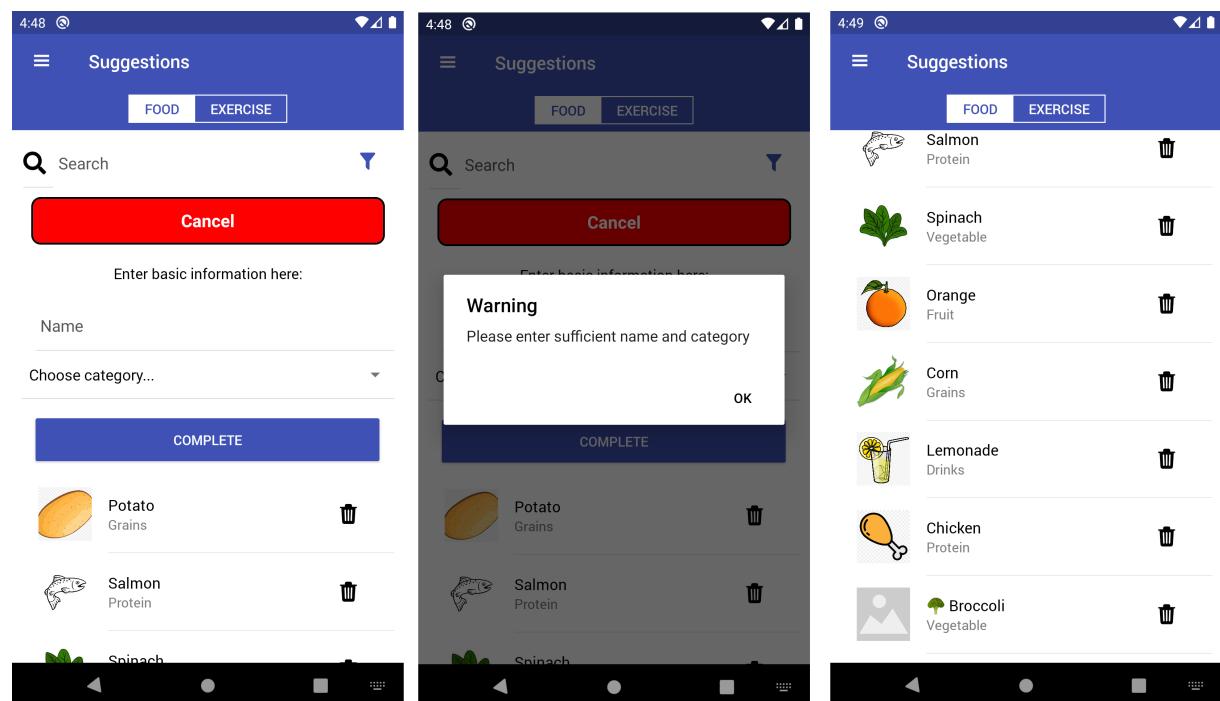
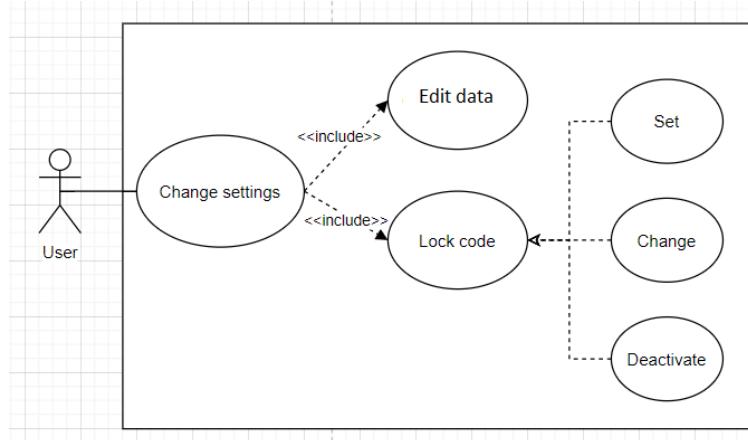


Figure 20: Mock-up screens for new items adding

### 3.6 Bui Minh Kiet: Receive Advice and Notification



#### 3.6.1 Use-case details

Use case ID	6
Use case name	Change Settings
Actor	User
Description	User can change settings on basic personal data, currency displayed and reminders
Trigger	User command
Precondition	User is at the home page
Normal flow	1. User chooses "Settings" in the <i>Drawer</i> tab 2. App navigates user to settings screen, which details options like daily reminder option, personal data edit, change currency,... 3a. User presses on the radio "Daily Reminder Notifications" 3b. System will turn the radio on/ off, and also will enable/ disable daily reminder respectively. 4a. User chooses the currency symbol on "Currency" option 4b. System will present a list of symbols currency for user to choose 4c. User chooses one symbol of choice 4d. System will save the currency symbols and display it on the home screen 5a. User chooses "Edit Personal Data" 5b. System presents the personal form for user to edit information 5c. User enter valid information and clic "Complete" 5d. System will saves the information and collapses the form
Exceptions	<i>Exception 1: at step 5c</i> If the user enters invalid information (negative age, null gender,...), system will alert user and block proceed.

#### 3.6.2 User story

- User can change app settings (including security and password as detailed by Do Anh Khoa) and personal data. So far, user can change reminder setting (on daily notification and on removing notifications) as well as changing personal data and currency displayed.
- Moreover, these changes will ease user experience on using and managing lifestyle with the app.

### 3.6.3 Mock-up

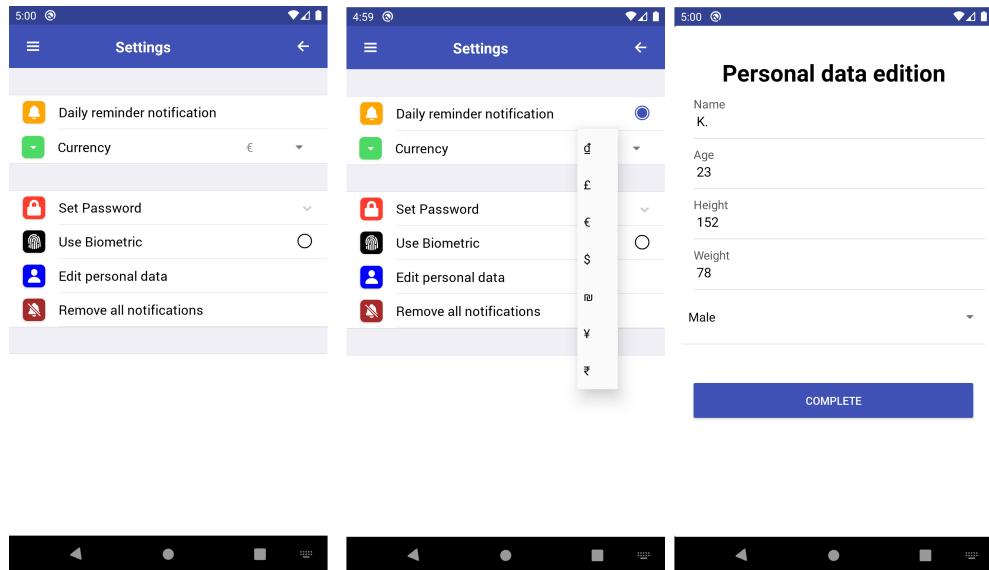


Figure 21: Mock-up screen for settings personal data

## 4 Software Architecture: Deployment Diagram

This deployment diagram details basic components used in our software. The *systemController* includes controller and redux classes connected to the database stored locally in *Redux Store*. The *UserView* composes of user screen and views, while other components will connect and perform functions for the app.

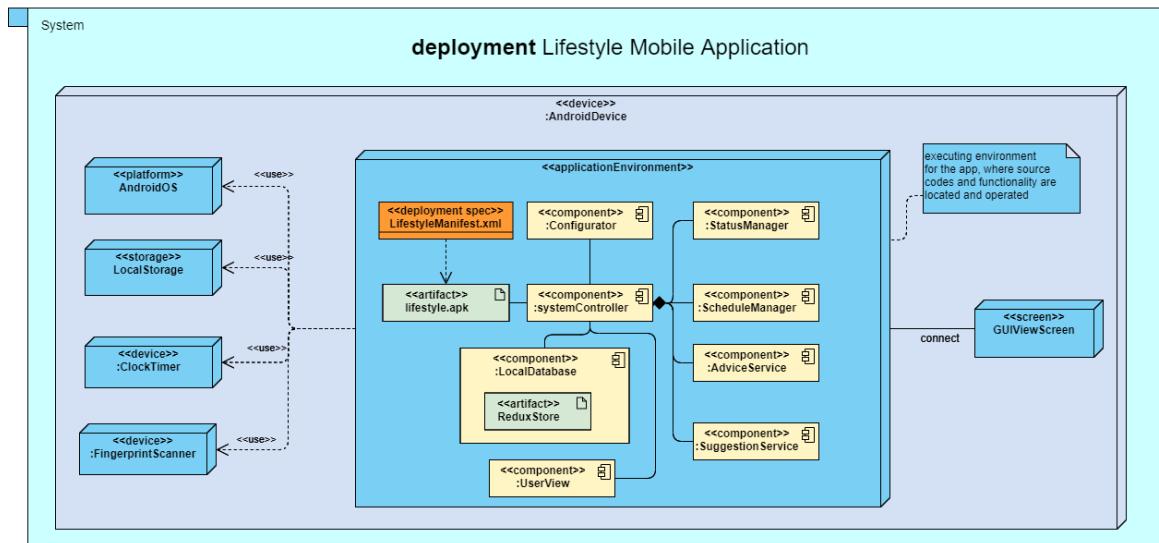


Figure 22: Deployment Diagram for Lifestyle system



## 5 Software Design: Class Diagram

We will present the overall system class diagram of our software, slightly adhering to the MVC Model with modification (the React Redux Model). The Main User Interface, consisting of several View class (named "...Screen") is managed and controlled by the app container class, AppNavigator. The View class will interact with the Controller class, which includes *PushController* controlling and managing the notification entity class *Notification*; and *AppReducer*, which will both interact with View class and Entity class (by modifying / retrieving data). The Entity classes managed by *AppReducer* are main user local database to be analyzed and updated while using the app. Updates to data will also be notified to screens and re-rendering them automatically.

## Lifestyle Software Class Diagram

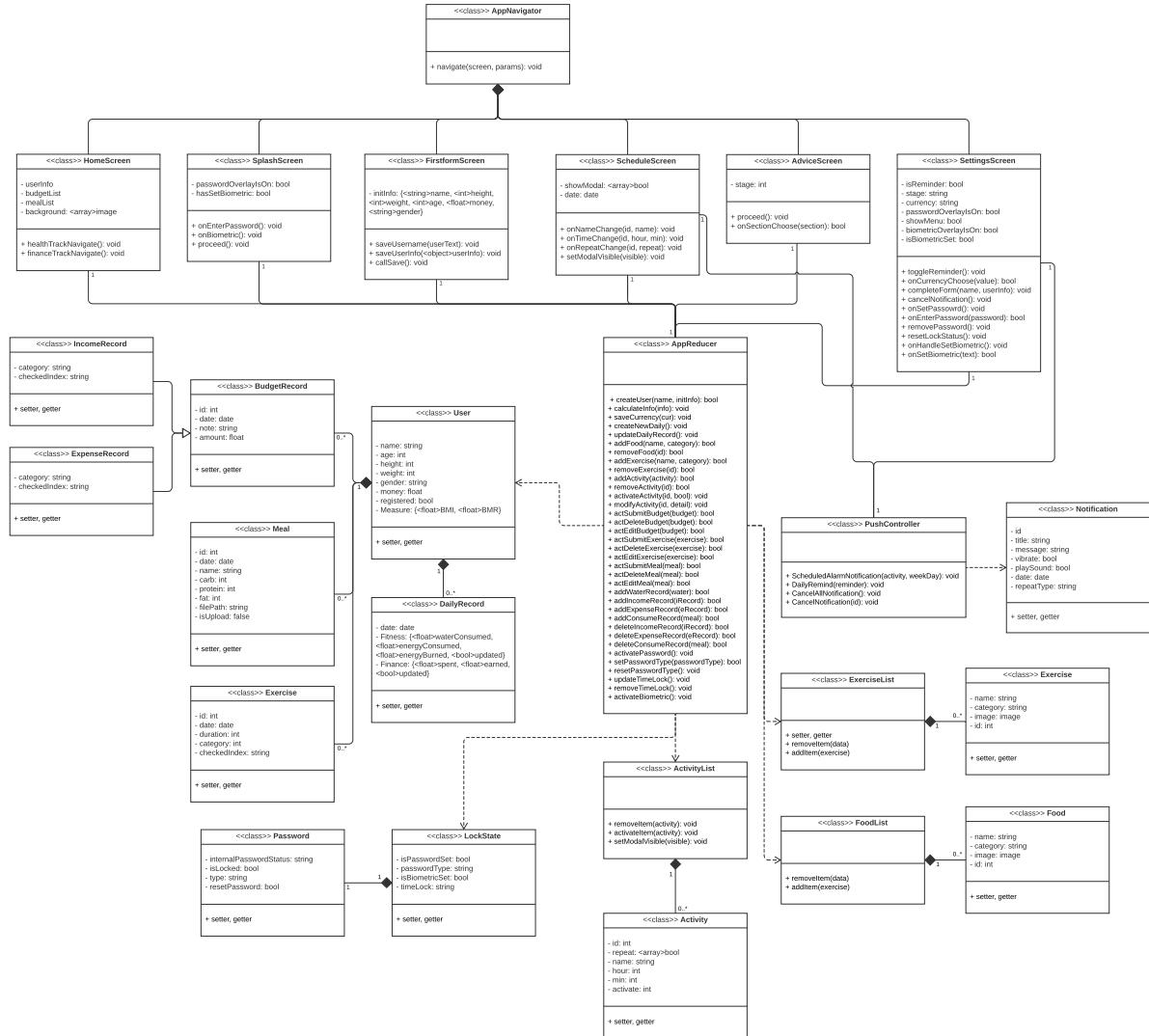


Figure 23: Class Diagram for Lifestyle system

## 6 Conclusion and development strategy

In summary, the project plans to develop a simple and convenient software that could still have great beneficial value for everyone. The monitoring features pose a comfortable way of tracking and setting up a healthy lifestyle. All in all, these kinds of applications are a great source of motivation and guide for modern residents.

Moreover, the future potential for this application is also visible, with expanded database on more daily aspects (studying, job recruitment,...) and advanced analysis tools for more helpful advice as examples. As the study of Computer Science progresses, the apps will be a reasonable space for our students to apply our knowledge for good use in real life.