An Intelligent Meal Planning System to Support Students 'Eating Well'

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Overview

User Research

After we surveyed students from various schools of the university, we noticed that some of them were having difficulty planning a healthy and regular meal, while others were hoping for lower-budget meals. According to our interviews with selected participants, students normally eat irregularly because of unexpected changes in their timetable or no time for diet planning, and students who would like to get lower-budget meals typically use some mobile notes applications to record their shopping lists and food costs. However, this is not sufficient for students who want a healthy or low-budget diet. During the research of literature, I realize that university students usually have less opportunity for nutrition education and overestimate their own health. (Hwang JH, 2015) Eating irregularly is linked to a higher risk of metabolic syndrome (high blood pressure, Type 2 diabetes, and obesity), and adults consuming calories during regular meals, i.e. at similar times from one day to a next, were less obese than people who have irregular meals. (Meghan Holohan, 2016) Therefore, I designed this system to help students plan their meals regularly and to suggest improvements based on their eating behaviour.

Intended users: Students who would like to eat regularly and get some healthier or lower-budget suggestions for their weekly meals.

Solution

The solution is a combined system with a timetable and a meal planning system. This system will be a mobile application that connects with student timetables and offers suggestions according to their preferences—eating healthy or being on a budget. (I'm not requiring students to make a selection but seeking a ratio for two different goals.) The different suggestions will be provided based on the ratio of the two goals. The suggested meal time will be provided to the students to help them eat regularly, and they will no longer check their timetable frequently to rearrange their meal time (irregular-meal avoidance). Because this system is connected with their timetable, we also could advise them whether to cook or eat out by the amount of free time on their timetable, especially for lunch. For students who would like to have healthier meals, this system will provide different suggestions for their daily meals and recipes. The

other features will be a market and restaurant suggestion based on their meal preference, a recommended recipes list for their food purchases, a reminder to record any ingredients they want to buy, a statistics page based on their weekly food cost and a suggestions list based on their food/restaurant behaviour.

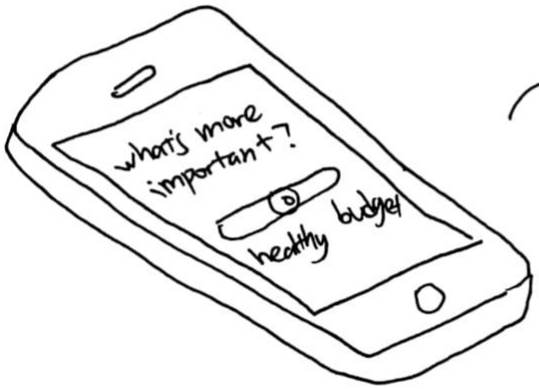
User Requirements

- The application should allow students to connect their timetable and provide a suggested meal time to help students eat regularly.
- The application should allow students to record when they actually eat, and provide weekly statistics.
- The application should allow students to record their meal cost and calculate the weekly cost for them.
- The application should provide suggestions based on their weekly meal if it is possible to improve.
- The application could provide a grade for students as an encouraging feedback which based on their weekly eating behaviour.
- The application should allow students to record their shopping list and analysis it to give a healthier solution.
- The application could contain a list of recipes to help students eat healthily.

Sketches of Ideas

The scanned sketches will be shown on the next page.

Idea 1: a smart phone app

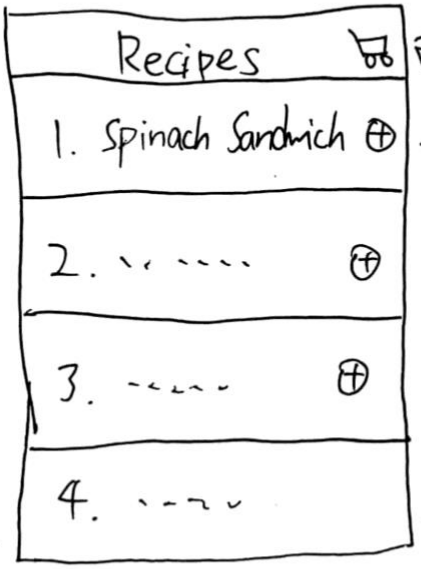


Canvas Login

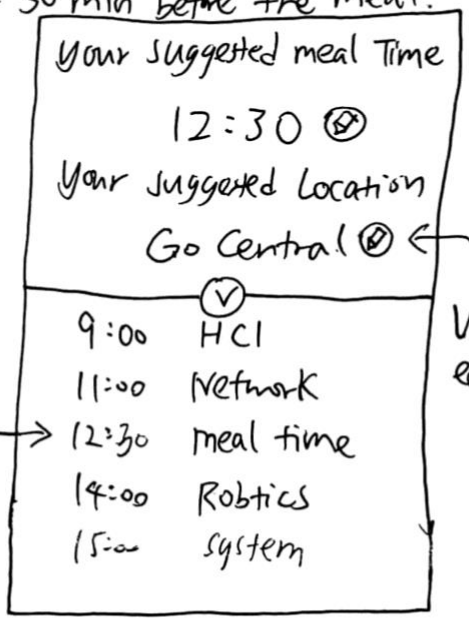
② Connect with their canvas timtable

① Understand user's preference

③ Provide suggested meal time base on their timetable & Suggested restaurant based on their preference. A notification will be sent 30 min before the meal.



Add to shopping list

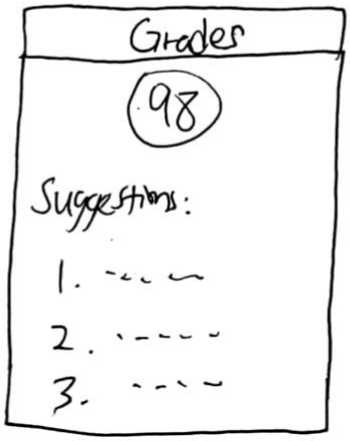


suggested time

Users could edit info.

④ System will provide some recipes to help students home cook. They could add receipes to shopping list and get a remind when they shopping.

⑤ User get a weekly report & grades for their eating behaviour.

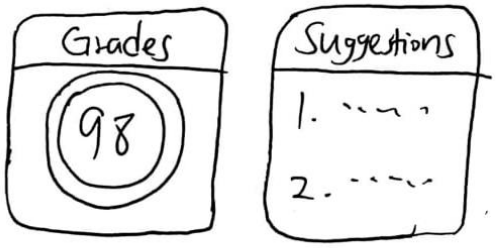


Idea 2 : a smartwatch app.

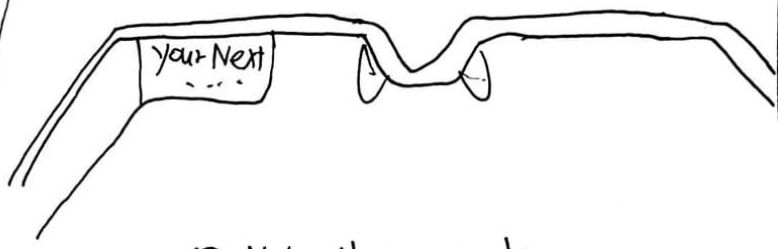
① Timetable connected. App send a notification 30 min before their every meal.

② Shopping List Reminder

③ Weekly Grades & Suggestions



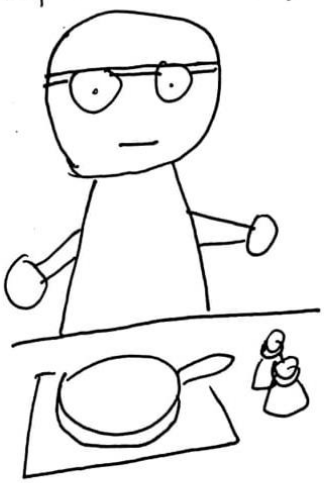
Idea 3: a Google glass app



① User get notification for their meal

② Remind user shopping list

③ Help them cook.

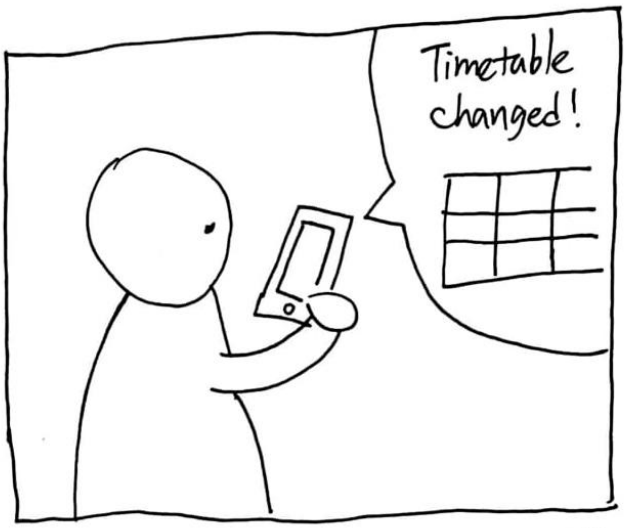


④ Provide suggestions & grades

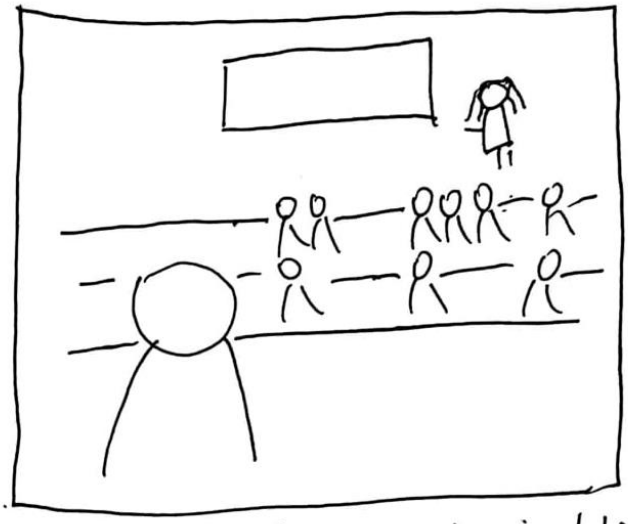
Well done ~
98 %

Storyboard for idea 1

University student : without my designed app.



It's 11.45 a.m. Tom checks timetable and notices his HCI lecture was changed to 12.00

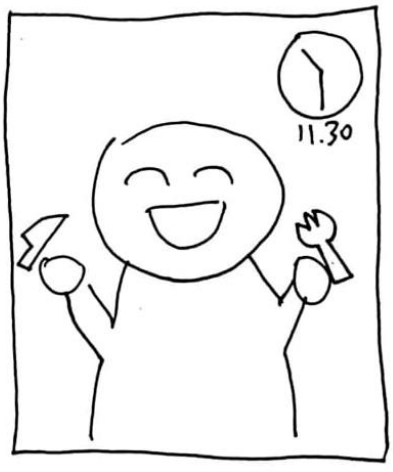


Tom goes to lecture and missed his lunch. Tom has to eat late (irregular meal).

University student : with my designed app.

Tom received a notification 30 min before his scheduled lunch.

Tom checks his timetable (which is on my app) and notices his HCI lecture was changed to 12.00.

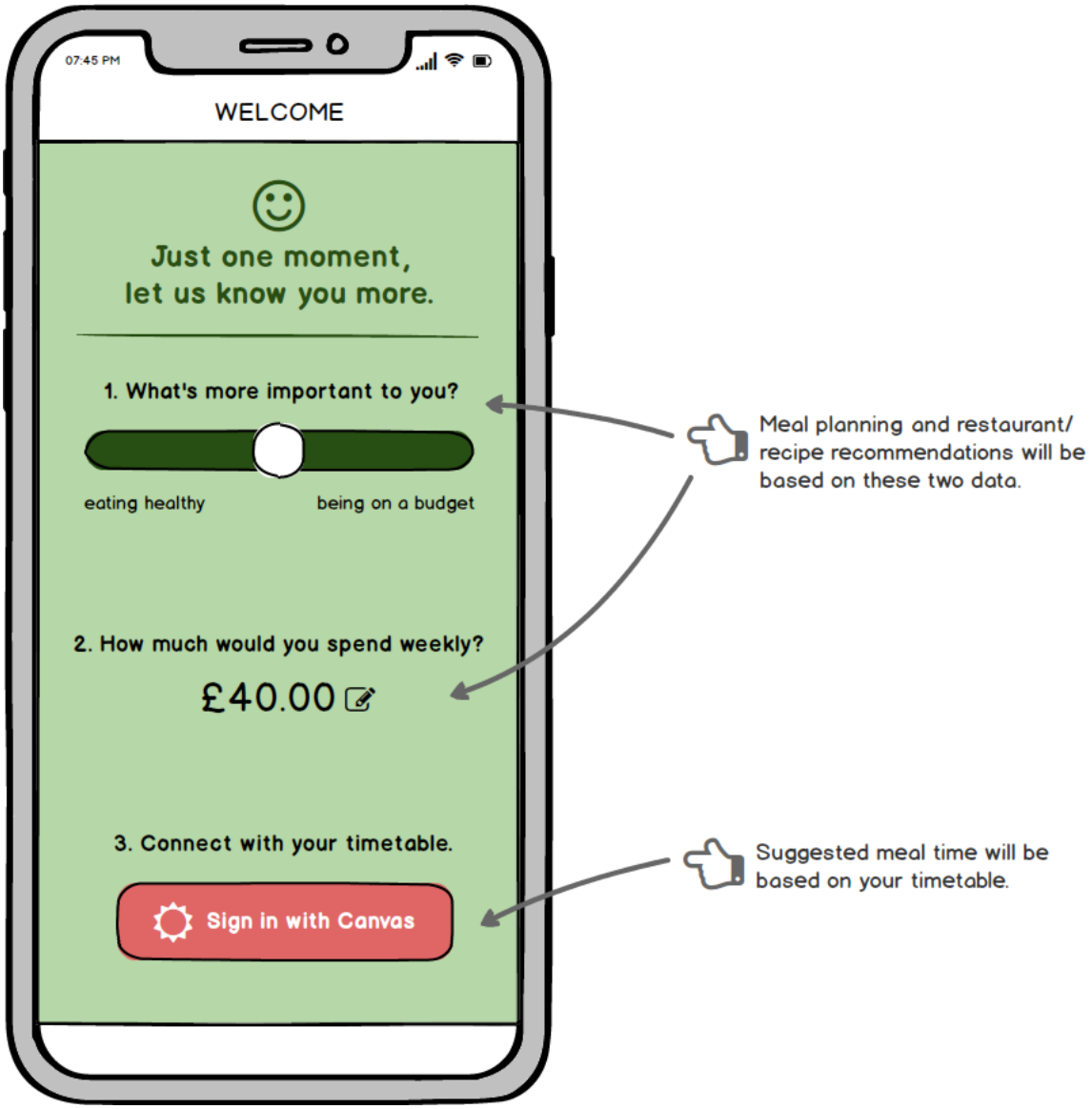


Tom eats his meal before the lecture

The Balsamiq Wireframes

Welcome Page

This page will collect user's dietary preference and weekly budget. Those two information will be used as data for meal planning. After users connected with their Canvas timetable, the system will be given out the suggested meal time and plan.



Timetable Page: Brief Suggestion

A timetable with suggested meal time will be shown as a main-page in this application. The suggested time is calculated from their timetable automatically. Users will receive a notification 30 minutes before the suggested time. If users would like to check more recommendations about restaurant or market (see next page), they could tap the expand-button. The suggested time slots will be several green bars in the timetable. Time slots are adjustable if users drag the right side of the green bar.

Timetable Page: Detailed Suggestion

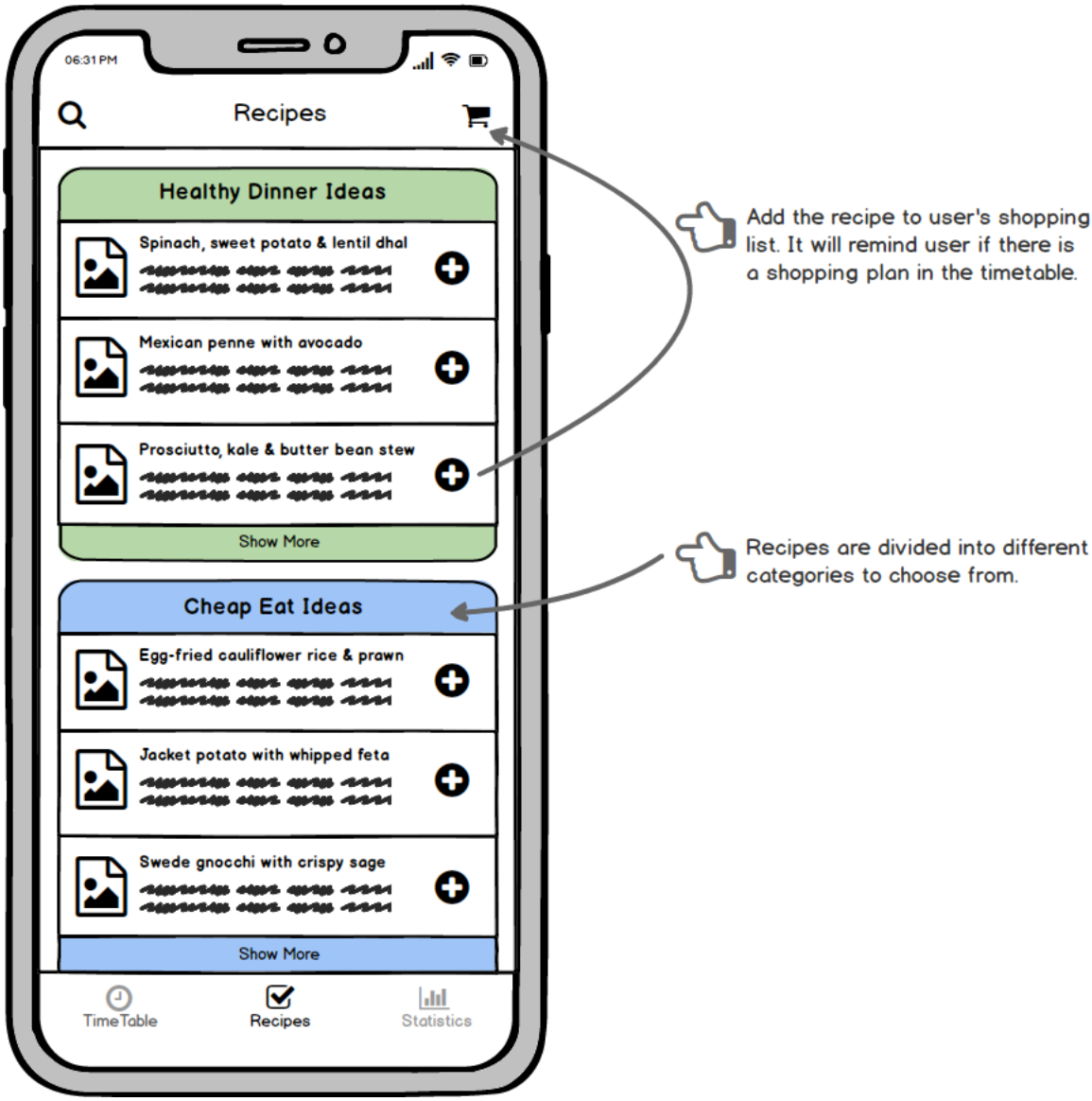
If users tap the expand-button below the suggested meal time, a full suggestion with time, location, and restaurant/market will be shown. The possibility of suggestion for eat-out or home-cook is based on the information collected from welcome page and free-time from Canvas timetable. An estimate cost will also be shown, user could change any estimate information (time, cost or location) as their actual information to get an weekly report based on their eating behaviour.

Timetable Page: Quick Change of Suggested Time

If users just want to adjust the meal time and get a meal notification, they don't need to check the expanded suggestion to change the time. The only need is drag the right side of the green bar. The interval of time will be changed to 5 minutes when they holding the green bar.

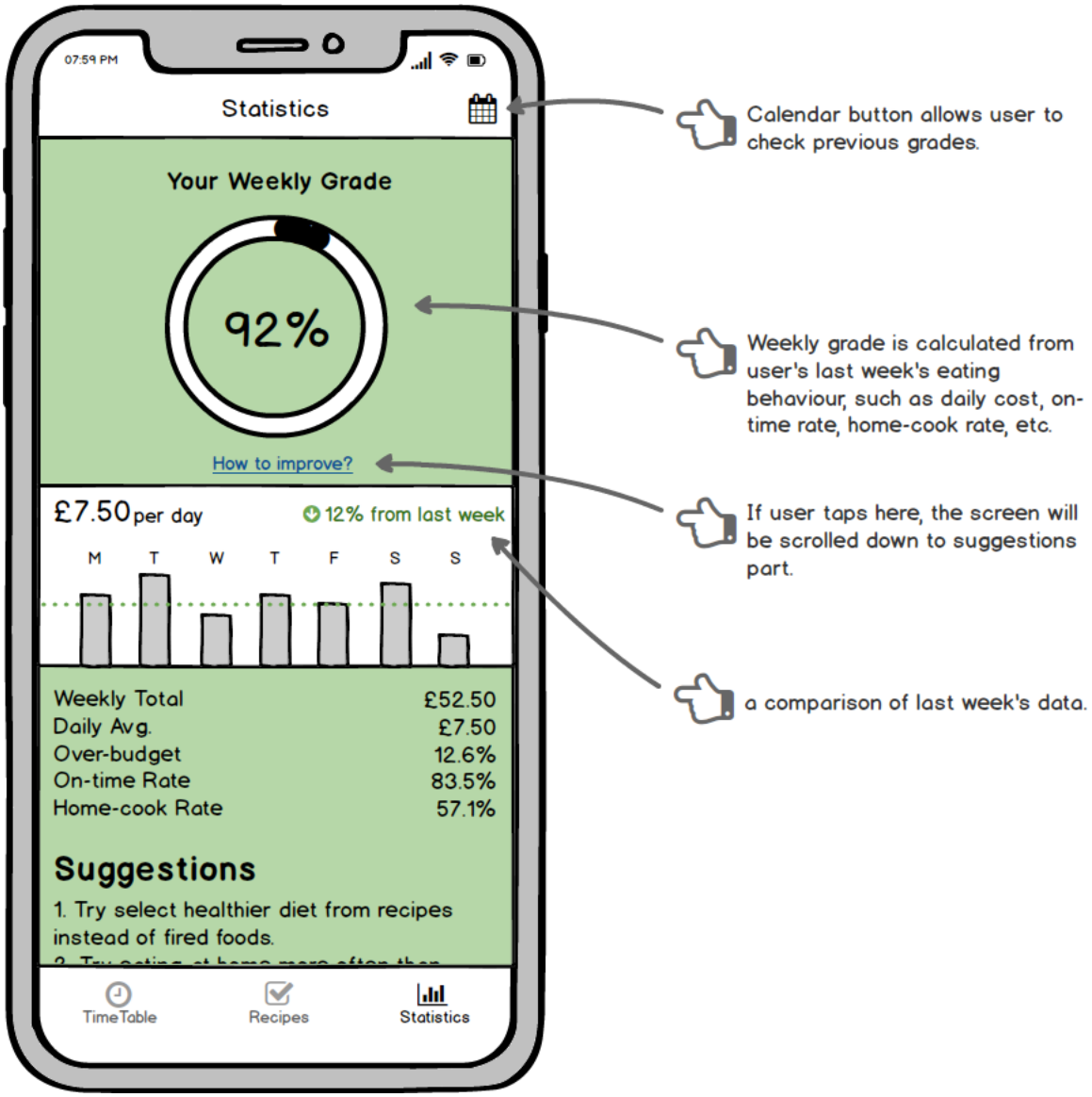
Recipes Page

When there is a home-cook suggestion appears on their timetable, the recipes button will lead user to recipes page. Recipes are divided into different categories for users to select. Tap the right plus button to add the specific recipe to user's shopping list. It will remind users automatically when they go shopping.



Statistics Page: Weekly Grade

Weekly statistics page provides a weekly grade for users, which is an encouraging feedback for users to improve themselves. Weekly grade is calculated from different aspects (daily cost, on-time rate, home-cook rate, etc.) of user's eating behaviour.



Statistics Page: Suggestions

Suggestions part is designed under the grades part. The page also will be scrolled down to suggestions part if users tap the how-to-improve button on the top. Suggestions vary according to user's weekly eating behaviour and grades, normally about nutrition suggestions and healthy suggestions.

Heuristic Evaluation – Form

Project: Intelligent Meal Planning System

Interface	**Issue**	**Heuristic(s)**	**F**requency 0 (rare) to 4 (common)	**I**mpact 0 (easy) to difficult (4)	**P**ersistence 0 (once) to 4 (repeated)	**Severity** = Sum Total of F+I+P /3
Timetable Page	The status bar at the bottom shows the current status, which is nice. But the status inside each page (especially timetable page) may be confusing to new users. It might be better to show a help content when users run it at the first time.	Visibility of system status	2	2	1	1.67
Timetable Page: Time-line Adjustment	Does user know how to exit the adjustment-state when they dragging the green bar in the timetable? I don't think non-smartphone users know that. An help phrase needed.	User control and freedom	0	1	2	1
Timetable Page: Time-line Adjustment	Drag-and-drop green bar provides the same functionality as the time-changing in expanded page. Although drag-and-drop provides convenience to users, try to think a better way to implement it.	Consistency and standards	1	1	1	1
Statistics Page: Suggestions	Most of the pages are in users' language, which is good. However, will there be some professional words in the weekly suggestion part (You blurred the words)? If there are, those can be replaced with users language or explained in detail.	Error prevention	2	1	2	1.67
Statistics Page: Grades	Weekly grades is attractive for novice users, but an expert user may only want to see the suggestions below the grades. Suggest you provide two tabs for these two things.	Flexibility and efficiency of use	2	2	2	2
All Interfaces	Lack of help documentation, although everything is very straightforward. It might be better to show a help content when users run it at the first time.	Help and documentation	2	3	2	2.33

References

Hwang JH, L. H. (2015). *A Study on Lifestyles, Dietary Habits, Nutrition Knowledge and Dietary behaviors of Male University Students According to Residence Type. Korean Journal of Community Nutrition* (Vol. 12). Taehan Chiyŏk Sahoe Yŏngyang Hakhoe.

Meghan Holohan. (2016). Irregular eating patterns linked to diabetes, weight gain. Retrieved December 5, 2018, from https://www.today.com/series/one-small-thing/irregular-eating-patterns-linked-diabetes-weight-gain-t100031