

GNG2101

Design Project User and Product Manual

[Mealtime – Mealtime Tracking Application]

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List of Acronyms and Glossary

Table 1. Acronyms

Acronym	Definition
ADD	Attention Deficit Disorder
BOM	Bill of Materials
CAD (in context of money)	Canadian Dollar
IDE	Integrated Development Environment
MIT	Massachusetts Institute of Technology
OS	Operating System
UI	User Interface
UX	User Experience
Wi-Fi	Wireless Fidelity

1 Introduction

This User and Product Manual (UPM) provides the information necessary for diabetic and ADD users to effectively use the Android mobile application entitled Mealttime as well as for prototype documentation. Our team, BAPN Designers, was assigned to a client that suffers from type II diabetes and ADD. ADD can cause an individual to talk excessively at times, be very disorganized, or even find it hard to focus on more than one task at a particular time. The client currently uses a glucometer to track his blood sugar levels. However, upon further analyzing this problem, our team was able to conclude that existing mealtime insulin tracking apps are too complex for a typical diabetic patient. Current mealtime insulin apps make the user keep track of extra factors such as proteins and vitamin content present within foods. These apps are more suited for medical professionals and require extensive background knowledge of the topic to operate these applications. After benchmarking these solutions, our team was determined to solve the problem once and for all, by creating a mealtime tracking application entitled Mealttime, which stores the sugar, starches, and fiber contents of each food, and then calculates the total carbohydrate intake. This is a very simple and easy-to-use app because the user is only asked for these contents and nothing more. The user can then utilize the carbohydrate content information and forward that to their medical doctor or another healthcare professional if needed. Our application is based upon an empathetic and user-friendly interface which provides precise calculations and is designed only for the Android OS. Thus, it is the most effective solution to combat the problems that diabetics face on a day-to-day basis. There are no security or privacy considerations associated with the use of the UPM.

2 Overview

There are many individuals that suffer with diabetes. Over 2 million Canadians are diagnosed with diabetes, which means 1 in every 16 people have been diagnosed with this condition. This is a very serious problem because it increases the risk of multiple cardiovascular problems, such as heart attack, stroke, narrowing of arteries (atherosclerosis), and chest pain (angina).

After our first client meet, our team presumed that we had to create a mealtime insulin tracker, just as how previous teams had done the same in which the primary goal was to keep track of one's glucose and insulin levels. A list of needs was derived for this application which are listed in the table below. This table consists of a numerical ranking system with a scale of 1 - 5, one being the least important and 5 being the most important.

#	Attribute	Need	Importance
1	The mealtime insulin tracker	has a simple interface and is easy-to-use	5
2	The mealtime insulin tracker	is a visual guide that stores photos of food/beverages	4
3	The mealtime insulin tracker	contains a reminder that notifies the user what type of food he/she is consuming	3
4	The mealtime insulin tracker	allows the user to input different grams of sugar	5
5	The mealtime insulin tracker	figures out the sugar debts for insulin	4
6	The mealtime insulin tracker	finds all the hidden sugar contents	5
7	The mealtime insulin tracker	is easy to install and Wi-Fi independent	2
8	The mealtime insulin tracker	is free for the user	5
9	The mealtime insulin tracker	is a commercially available app for diabetic patients	4
10	The mealtime insulin tracker	protects the user's private information	5
11	The mealtime insulin tracker	accurately calculates the inputs of carbohydrates and fibers	5
12	The mealtime insulin tracker	contains radio buttons and nested menus	1
13	The mealtime insulin tracker	is bug-free and does not crash at any point during the application's usage.	4
14	The mealtime insulin tracker	is non-intrusive	5

15	The mealtime insulin tracker	records the daily insulin by the user	3
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However, after the second client meet, the goal of creating a mealtime tracking application was established and what we had aimed to create before was no longer needed. This took a lot of stress and weight off our shoulders and it was due to our misunderstanding originally for needing to create a mealtime insulin tracking application. At the end of our project, we created a mealtime tracking application and an image of this is shown below.

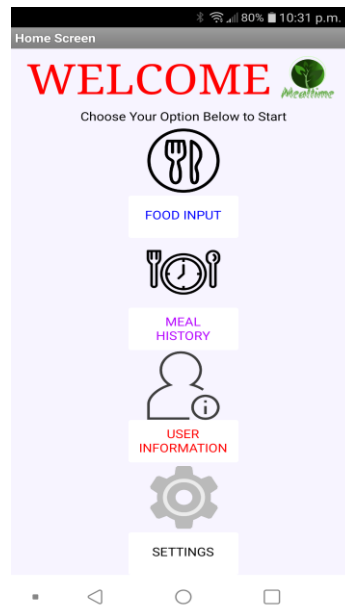


Figure 1: Mealtime – Home Screen

The Android mobile application was created using a web-application IDE entitled MIT App Inventor. This was originally created by Google and is currently maintained by MIT. App Inventor is a free-to-use cloud service that allows one to create their own mobile apps using a block-based programming language. The block-based system utilizes a drop-and-drop approach that is very easy for the user to create. This service is accessible through all Internet browsers, whether that's Google Chrome, Mozilla Firefox, Safari, etc.

The major functions of Mealtime are that firstly, it asks the user to input up to a maximum of five foods and each of these foods can be a part of a certain meal category (breakfast, lunch, snack, or dinner). For each food, the user must enter the sugars, starches, and fiber contents in units of grams, after which the user is taken to another screen that displays the summation of each of these contents, and the total carbohydrate intake for that given meal. The secondary function is that the user can view a bar graph for each of the meal categories. This graphical representation of the data really enhances the UX of the app and creates a more aesthetic display for the UI. Alongside this,

the user can view all the previous foods that were entered and clear the database that stores this information in the settings menu.

2.1 Conventions

There are no stylistic and command syntax conventions present within this UPM.

2.2 Cautions & Warnings

The app is packaged in a .apk file so when the user downloads this file to their Android mobile device from our team's MakerRepo page, they may need to change the settings on their phone to allow permission for the installation of non-market applications. Also, upon starting the app for first time-usage, the user must go to the Settings menu and click on the "Terms of Use" button which states all the terms and conditions as well as the app's privacy policy. They must agree to what is stated on this page, before using Mealtime.

3 Getting started

Please look at section 3.4 for a detailed walkthrough of the application.

3.1 Set-up Considerations

The user must download the app from our team's MakerRepo page, which is packaged as a .apk file. Then the user opens this file on their Android phone and may or may not need to allow for permission of installing non-market applications. To allow for permission, the user must go to the settings menu on their phone and click the button that says "Allow."

3.2 User Access Considerations

This application is only available for the Android operating system because .apk files are known to crash or cause errors when running on an iOS mobile device.

3.3 Accessing the System

To access Mealtime, the user must open the application from the location that is saved on their mobile device. There is no login or ID that is required to start the application.

3.4 System Organization & Navigation

Upon first starting the app, the user clicks SETTINGS. Then they must click Privacy Policy which states the privacy policy, types of data collected, and security of your personal data. The individual must agree to these terms and conditions before using the app. Then they must go to the main menu and click on FOOD INPUT. This displays the outline of one food entitled FOOD 1. The Name, Category, Quantity, Starch, Sugar, and Fiber labels are displayed for the user to enter. The user enters these quantities and can then click Add a Food so this process may be repeated. After the user has entered their desired number of foods (≤ 5) for a given meal, then they must click the Calculate Total button. This will take the user to a page that lists the total starch, sugar, and fiber contents for a specific meal, and the total carbohydrates intake, all in units of grams. These results can be used for the user's further analysis if need be. Then there are two buttons underneath, one that says Enter New Foods, and another that says Return to Home. If the Return to Home button is clicked, then the user is brought back to the home screen. After this, the user can click on MEAL HISTORY. Then the user is taken to a screen that has two buttons, one that states Bar Graph and another that says Previous Foods. By clicking on Bar Graph, this displays a bar graph with the types of meal categories on the y-axis, and the grams values for each meal on the x-axis. The user can then visually see the blue bars which display how many grams they have consumed for each meal category. Then if Previous Foods is clicked, this displays the name of all the past foods the user has entered, separated by meal category, and then three columns which represent the starch, sugar, and fiber quantities. After this, we go back to the home screen once again. Then the user clicks on the USER INFORMATION menu, and this takes one to a screen that displays textboxes for Name and Email. The user can enter any name or email they wish, and it is important to note that all information entered on this page is saved to the App Inventor's cloud database. The user can edit the Name and Email by clicking the EDIT button and then click on the SAVE button to keep all the changes they have made. Then the BACK button is clicked so the user is redirected to the main menu once again. The user then goes to the SETTINGS menu and can toggle the Reminder feature to be ON. Once it is turned on, it displays three textboxes, one that asks the user "What would you like to be reminded of?", and the second and third boxes asking the user to input the time they want the reminder to display on their screen. The user must know that this time uses the 24-hour clock system and if a reminder message and its time are entered, once the desired time has reached, the Clock application on the user's phone will display that message and an alarm sound will ring as well. This allows the app to be easily integrated with other applications currently on the user's Android device, instead of it being a standalone product.

3.5 Exiting the System

To properly exit the application, the user can simply click the right-sided square present at the bottom of the screen if it is present on their Android phone, and that minimizes the screen window, after which there should be a button that states something like "CLEAR ALL." The user must then click "CLEAR ALL" to fully exit the application.

4 Troubleshooting & Support

If the user does encounter a problem, they must exit the application and restart it.

4.1 Error Messages or Behaviors

There should be no error messages or undesired behavior present within the app.

4.2 Special Considerations

There are no special considerations that must be considered for Mealtime.

4.3 Maintenance

There is no procedure required for regular maintenance of the application.

4.4 Support

There is no support team or help-staff for this application.

5 Product Documentation

5.1 <Subsystem 1 of prototype>

5.1.1 BOM (Bill of Materials)

Item Number	Application Type	Description	Quantity	Unit Cost	Extended Cost
1	Google Slides	An online application that allows for collaboration between people to create presentations	1	\$0	\$0
2	MIT App Inventor	Online web application (IDE) created by Google. It is designed to teach computational thinking concepts through creating mobile applications. Designed primarily for Android and utilizes block components to create code.	1	\$0	\$0
Total	N/A	N/A	2	N/A	\$0

5.1.2 Equipment list

The only equipment needed to build the subsystem was MIT App Inventor.

5.2 Testing & Validation

The app was tested using a Google Forms survey. This survey spanned over the course of one week and the participants included the team members' family and friends. They provided a lot of feedback regarding their UX, the app's UI and what screens worked best with what colours, the functionality of the subsystems, and much more.

6 Conclusions and Recommendations for Future Work

In Deliverable I, the team has developed a detailed user manual for the future clients and students who wish to use or analyze and further improve our application Mealttime. By completing this deliverable through and through, our team has learned that it is extremely important to thoroughly test all components of a product after completing it. Writing the user manual helped put ourselves in the client's shoes and empathize with him to understand what they would like to

see using the app for the first time. Using this information, we were able to make large and small changes and then outline what the most confusing parts of the app would be for our client and rectify them as much as possible.

For future groups, there are many steps that can be taken to further improve our application. Firstly, having the app displayed in a variety of languages would be beneficial because for those who are non-English speakers, they cannot understand the app's functionality because it is present in the English language which may be foreign to them. The second language that is most beneficial for implementation is French so having the ability to change between various languages will be a huge asset to this application. The second is arguably a very big change and that is to create the app using another web-based IDE entitled Thunkable. Thunkable is very similar to MIT App Inventor, however it allows for a much better UI and more aesthetically pleasing app design. Currently Mealtime does not look very good and instead is very plain-looking. Thunkable uses a subscription-based model, however it is very much worth it because it will allow for the creation of a well-polished app. The tertiary change that can be made is to store all the user's meal history data into text files that can be accessible on any device. With this, the user can directly send their numerical information to their healthcare provider without having to write each of these values down or screenshot them using their phone and then send the data. These are only some changes that may be implemented, but many more can be added to further enhance the app's usage. Our hope is that Mealtime will continue to be refined, for generations to come.

APPENDICES

7 APPENDIX I: Design Files

No design files were needed for the making of this document. All the previous deliverables, source code, as well as other important documents are listed on our team's MakerRepo webpage. PLEASE LOOK AT THIS WEBPAGE FOR A DEEPER UNDERSTANDING AND ANALYSIS OF HOW THE ENTIRE APPLICATION WAS CREATED.

The link is as follows; <https://makerepo.com/AbdelSB/848.gng2101-team-d1-bapn-designers-mealtime>