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Table of Contents

1. Introduction

1.1 Background and problem

Childhood obesity has become a pervasive social problem around the world. According to the World Health Organization (WHO), the number of overweight children under the age of five is estimated to be over 41 million in 2016 around the world. In Australia, 25% of children (aged 2 to 17) were overweight or obese in 2014-15 (Australian Institute of Health and Welfare, 2018). Furthermore, those kids are likely to stay obese as they grow up and more likely to develop diseases like diabetes and cardiovascular diseases at a younger age than other children (World Health Organization, 2018).

Obesity leads to several diseases but not limited to type 2 diabetes and chronic diseases including cardiovascular diseases which costed the Australian government around $48 billion in 2008. Whilst obesity is a complex issue with many contributing factors, one important factor is exercise. Exercise burns off energy obtained from the food we eat, rather than allowing our bodies to store it as fat. Diet is also crucial – what and how much energy the person consumes is a leading contributor to obesity. Diet and exercise are things that can be changed and are within control, however it is important to recognize that medical and genetic issues can also contribute to obesity – these are not easy to control without medical advice.

1.2 Solution

The aim of our project is to help kids with obesity or overweight to make a healthy choice and thus make both the parents and the kids happy. The target audience in this project will be the parents with kids from 5 to 10. The project will develop a system that will primarily be a website with different functions and it will be divided in three iterations which will remedy the situation.

Our project aims at helping the parents of those kids with obesity by providing a fun and healthy environment where they will be encouraged to go out and be more active and be physically fit. In addition to that they will be able to access a list of recipes on the website where there will be recipes of dishes which are easy to cook. This will benefit their children by being healthy with fresh nutritious ingredients that will not take precious hours to prepare. Moreover, the website will provide a sugar tracking function for parents and help them to monitor the sugar intake of their children.

1.3 Lean Canvas

Problem / Need	Solution	Unique Value Proposition	Competitive Advantage	Customer Segments
1. Increasing number of obese children in Australia. 2. About 25% of children are obesity or overweight in Australia.	Provide a health tracking website for parents of obesity or overweight children. **Key Metrics** Using a network traffic calculator to count how much time the website has been visited.	1. Parents and kids can know more information about the problem of over sugar intake and be aware of overweight and obesity issue. 2. Parents can also take suggestion from the website and control the sugar intake of their children. 3. Parents can make a plan for their children about what date they will go which parks or playgrounds. 4. Parents can track their playing history by using the calendar function provided on the website.	**Channels (Marketing and Communication)** Website over the Internet	Parents of obesity or overweight children (age group from 5 -10)

2. Iteration Overview

The project will be divided into three iterations, and various functionalities will be developed as the passing through of iteration procedure. At the end of the iteration process, the team will deliver a completely building product which can developed to contain more functionalities, more features as well as usability, security, reliability.

2.1 Persona

Several personas are provided as below to help demonstrate the requirement of the product.

Photo	Name	Age	Gender	Background	Motivation
	Mary	30	Female	A teacher as well as a mother of one overweight child (8 years old), own a Bachelor of Education degree	The weight of her child is increasing day by day, and she wants to know the sugar level of different drinks and snacks to help her decide what to provide for her child to eat.

	Jack	35	Male	A software engineer and a father of 2 girls (one of the children is obesity, both girls are 6 years old), divorced, has a Master of IT degree.	He is busy in the work and has limited time to take care of his girls, he wants to look for health diet list for his girls and save his time.
	Vivian	40	Female	A housewife with no job, a mother of two obesity children (a 6-year-old boy and a 9-year old girl), has lots of time.	She is worried about the health problem of her children, she cooks health food for her children but none of them love the food, she wants to look for cooking suggestions and experiences shared by other parents and makes her children love the healthy food.

2.2 User stories

Iteration 1 **(done by 31/08/2018, Week 6)**	The primary work on iteration 1 is to construct the main framework of the website, and to set up the whole system on the cloud server. The main functionality of this iteration is to provide a sugar level calculation.		
Epic	As a user, I want to know the sugar level of different snacks and drinks and I want to calculate the total sugar level of snacks or drinks I provided for my children, so that I can know whether my children have taken too much sugar and I can adjust the amount of snack for my children based on the result.		
Story Number	User Stories	Status	Priority
1.	Mary wants to know how much sugar in drinks or snacks so that she can knows whether her child is having too much sugar.	Completed	Medium
2.	Vivian wants to calculate the total amount of sugar she provided to her children so that she can adjust the sugar plan for her children based on the calculation result.	Completed	High

3.	Jack wants to know how much sugar is appropriate for his daughters so that he can save his time and provide low sugar level food for his daughters.	Completed	Low
Iteration 2 (done by 14/09/2018, Week 8)	The main work on iteration 2 is to update the system database and the main functionalities of this iteration is to provide a map function for users and the map is combined with calendar. Information page about diseases of over sugar intake will be on the website as well.		
Epic	As a user, I want to look for nearby playgrounds and parks for my children and add an activity to the calendar and go back to track the activity in the future so that I can know where I have taken my children to and how much time we spent on the parks or playground.		
Story Number	User Stories	Status	Priority
1.	Jack wants to know the parks near his home so that he can know where to take his daughter to play.	Completed	High
2.	Mary wants to have an account for the website so that she can go back and track the activity she has planned for her children.	Completed	High
3.	Mary wants to add activity on the calendar based on the parks or playgrounds so that she knows how much time she spent with her children on which parks or playgrounds.	Completed	Medium
4.	Vivian wants to the information of health disease related to over sugar intake so that she can remind her and her children not to take too much sugar.	Completed	Low
Iteration 3 (done by 28/09/2018, Week 10)	The main purpose on iteration 3 is to improve and perfect the functionalities done on the previous iteration. More functionalities could be added on iteration 3 such as the sugar intake tracking and diet list suggestion.		

Epic	As a user, I want to record the sugar intake for my children every day and go back to track the sugar intake whenever I want so that I can monitor how much sugar my children have taken and provide appropriate amount of sugar for my children. I also want to look for diet food suggestions so that I can know what is good for my children.		
Story Number	User Stories	Status	Priority
1.	Vivian wants to look for healthy food recipes so that she can prepare healthy food for her children.	Completed	High
2.	Mary wants to know the history of how much sugar she provided for her child so that she can better control the sugar level for the upcoming date.	Completed	High
3.	Vivian wants to add the recipes on her account so that she can check the recipes easily and save more time.	Completed	Medium
4.	Jack wants to look for the weather of the following date so that he knows whether he can take his daughters to go picnic.	Completed	Low

2.3 Change from iteration 2 to 3

The main functionalities for iteration 2 are remained unchanged and some to the function is updated. The map function and the calendar are used to be on the same page, but now these functions are on different page and the combination between the two functions are still linked together. A weather forecast function was added on the map function page. It allows users to check the weather for the following date which help users better plan their entertaining schedule.

Sugar calculation, sugar tracking function, activities planning function are now combined with the login and register function. Users can still use the basic function as they did in iteration 2, but in iteration 3, users can save the sugar calculation result, tracking the sugar level of their children as well as look up activities planning after logging in the system.

The UI design for the website has been updated. The font, background and the colour are consistent now. Recipe, which was moved from iteration 2 to 3 has finished on iteration 3. User can save recipes on their account so that they can access the recipes they like more convenient. Data visualization, which is about the proportion of obese and overweight in Australia from 2014 – 2015, is added on iteration 3 and users could

see the issues of over sugar intake clearly.

2.4 Security

The main security of iteration 1 is the communication channel. The website is on the Internet and most of the servers will be allocate on the Azure cloud server. Therefore, for the security of the website, SSL encryption as well as the certificate are required on the setting of the website.

The main function provided on iteration 2 is map function, calendar tracking function, register and log in function as well as information providing function. As such, security issues could exist on the register and login function. SQL injection should not be a problem in the system because the language for the system is ASP.Net and it prevent the SQL injection. The problem is the register and log in function. User are required to register to the system before they can use the tracking function provided by the system. The strength of the user password is important. the system should force user to set a strong password, otherwise user account can be hacked easily. Although the website will not require use to input personal information, the password should be strong enough to prevent users account from losing.

Issue on the iteration 3 is the cross-site scripting (XSS). User are allowed to input data in the activity description under the map function. XSS could happen if user input a script on the activity description. To prevent this, user input should be limited and checked to make sure the problem will not occur.

3. Current iteration

3.1 Detailed Description of Iteration 3

The main functions in iteration 3 is providing information about healthy food recipe, tracking the sugar intake, and providing the visualization for users.

Users can check the healthy food recipe from this website. They can know the food ingredient and the approaches of cooking healthy food. Through the recipe tab, users can learn to cook more healthy diet for kids to instead of sugar.

In addition, users can track their daily sugar intake. This function allows users to calculate and add current sugar information into their calendar. Users can also view the history of previous sugar intake. Therefore, they can compare and realize the sugar level in different time.

Another information page will provide data which are visualized to users. The page will state the problem of overweight and obesity in Australia by providing visualized chart or histogram to users and it should help users better understand the issue of over sugar intake.

3.2 Acceptance Form

Users can access the website and use the sugar tracking function to track their children's sugar intake. Recipe page also provided to help user cook healthier.		Website: sugarbattle.tk		
User Story		**Acceptance Criteria**	**Y/N**	**Feedback**
1	Vivian wants to know healthy food menu, so that she can learn to cook more healthy food for kids	The website can successfully provide the information of recipe		
2	Vivian wants to know the history of how much sugar her kids have eaten, so that she can better help kids to control the sugar intake	Users can successfully track the history of sugar intake		
3	Jack wants to look for the weather of the following date so that he knows whether he can take his daughters to go picnic.	The website shows weather on the up-coming date.		
4	Mary wants to save the recipes in her accounts so that she can access the recipes easily next time.	Users can save recipes in their accounts.		
5	Jack wants to add drinks or desserts to current day, so that he can better track his kids sugar intake.	Users can select and add drinks or drinks successfully.		
6	Mary wants to view the data in a visualized way so that she can understand the issue deeply.	The website shows the data visualization in an appropriate way.		

4. Data Source

4.1 Data Description

Regarding the dataset used for the project, the Australian Institute of Health and Welfare has a breakdown of obesity and overweight in kids according to ages and this is shown over the last four financial years and this conclude how obesity is becoming an issue. The dataset shows which cities across Australian are affected and the percentage of the population with obesity kids. Regarding the dataset for the 4 categories items we aim at, there is an open source data which originate from

openfoodfacts.com. We are using Australia specific datasets for the items in the website.

In addition to our functionality we have added a map for location of playgrounds and took the data from the data. The data will help in the location of different playgrounds where the parents can take the kids and be more active. Below is a tabular form of the data sources.

Open data related to overweight and obese children are retrieved from the Australian Government websites and the data are utilized on the data visualization section of the website.

Dataset	Year	Granularity	Copyright	URL	Update Frequency
A picture of overweight and obesity in Australia	2017	The data is in Excel showing the age range of people (both male and female) in the overweigh or obesity threshold	https://www.aihw.gov.au/about-our-data/accessing-australian-government-data	https://www.aihw.gov.au/reports/overweight-obesity/a-picture-of-overweight-and-obesity-in-australia/data	No update
Open Foodfacts-Australia	2018	The data is given in all the ingredients included in the items including the country of manufactured.	https://au.openfoodfacts.org/data	https://au.openfoodfacts.org/cgi/search.pl?search_terms=sugar+drinks&search_simple=1&action=process	As and when required
Playgrounds in Melbourne	2018	The maps are shown on a spatial coverage where streets names and parks names are provided	https://data.gov.au/about	https://data.gov.au/dataset/playgrounds	As and when required
Google Map API	2018	The website will embed a google map API on the location page.	https://cloud.google.com/maps-platform/terms/#17-copyrightpolicies-content-removaltermination-of-repeat----offenders-accounts	https://developers.google.com/maps/documentation/javascript/tutorial	As and when required

4.2 Data Model
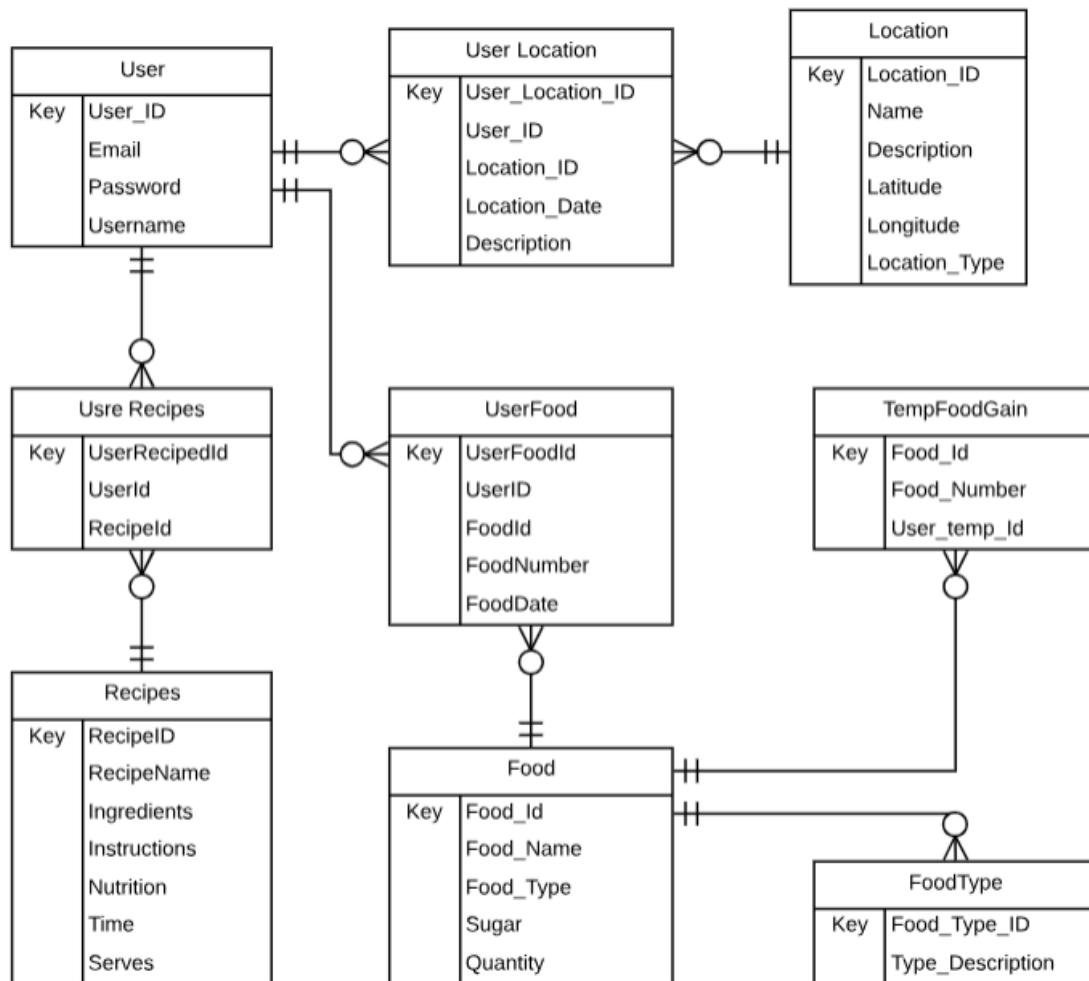
ER Diagram

There are nine entities in the model at the end of iteration 3, which are 'Food', 'FoodType', 'TempFoodGain', 'UserFood', 'User', 'UserLocation', 'Location', 'UserRecipes' and 'Recipes'. The diagram above shows the relationship between these entities.

In the website, users can select the food or drinks and calculate the sugar level of the items they selected. Food is an entity that hold all information about the food items. FoodType is an entity that relates to Food entity and this entity record various food type. The TempFoodGain entity is serving for the sugar calculation functionality and it will be stored temporary information of the food collected by the user.

The 'User' entity records the basic information of user accounts, it will be utilized on the sign in and register function of the website. The 'Location' entity works for the map function of the website; the parks and playgrounds information are recorded in this table. 'User Location' works for the function of calendar and map function. When user add

activities to the calendar and add place from the map, this entity will be used. 1 user can add more than one location and activities on the calendar and on location can response to different users.

The entity UserFood is utilized to link entities User and Food. This entity is designed on the database to store the food user selected and to works for the sugar calculation function.

The entity Recipe is added on the database on iteration 3 and it stores the data about the recipes of the website. User can save any recipes in their account and the data will be saved in the entity UserRecipes.

5. Testing Detail

5.1 Testing Details

Tester	Hours spent on testing functions	Methods used
Kang (a student studying in Monash university)	15min	User test the website by using the manual input. Users gave feedback for the website and discussed ideas for next iteration. https://www.youtube.com/watch?v=7AlgjXG1AK4&feature=youtu.be
Tony (team member)	20min	Test website using manual input. The layout of each website pages has been tested, and "sugar intake", "Disease", "recipes" and "Location" functions are tested.
Songnan Lin (team member)	20min	Test website using manual input. Testing the background and layout of the website pages. The functions of "Sugar intake", "Disease", "Location", "Location tracking", and "recipes" are tested step by step.
Lu Chen (team member)	20min	Test website using manual input. The website font and background consistency are tested. The functions of "Sugar intake", "Disease", "Sugar Tracking" and "Location" are tested step by step.
Ram (team member)	20min	Test website using manual input. Testing website layout and functions. Functions of "Sugar intake", "Disease", "Recipes", "Sugar Tracking" and "Location" are tested step by step.

6. Appendix

6.1 Changes from iteration 2 to iteration 3

No.	Iteration 1 changes	Status
1	Change the user interface design of the website	The style and background have been changed now
2	Remove the "About Us" part in home page	The information of "About Us" has been removed from the website
3	Change the website word font	All the words have been changed to be the same font
4	Change the format of food pictures in "Sugar Intake Page"	Remove the food information under the picture, and just show the food pictures now
5	Change the user interface in "Result" page	The style of "Result" page has been consistent with other web pages
6	Update the database of snacks and drinks, more data have been added to the database.	All the data of snacks and drinks have been changed to be more accurate and correct
No.	Iteration 2 changes	Status
1	Adding information in home page picture	The background of the picture in home page has added information
2	Changing the pictures and word font in disease fact page	All the word font has been consistency
3	The format of location page has been changed	Users can select the calendar or map according to their need
4	The word font in manually enter sugar page has been changed	Word font has become same as other word font
5	Remove the result page.	The result page has been removed.
6	Modifying the result page format and layout, the result page is now on the same page with the sugar calculation page.	The layout of result page has changed compared with previous page, it is more appropriate now.
7	Changing sugar calculator, fact, and location page guide title	All the guide information has been changed to be more clearly for users to understand.
8	Changing the layout of the map function page, the map and the calendar are now in different page. Users can still add activities on the calendar after user logging in.	The layout of the website is clear and easy for users to use the website.

9	User can add food manually and the new-added food will be store in users' account.	Each user has their own food collection and the added food can be seen on their account.
10	The logo of the website has been changed to a new one.	New logo is shown on the website.