Project Charter

<Personal Food Log App>

<Group 5>

University of Ottawa

School of Electrical Engineering and Computer Science

ELG 5100 Group Project

Table of Contents

Section 1. Charter Introduction

1.1 Document Change Control

Revision Number	Date of Issue	Author(s)	Brief Description of Change
1.0	2019/09/20	Xu Zhang, Yuhao Shen, Yi Pang, Ke Yang	First Version of Project Charter
2.0	2019/09/27	Xu Zhang, Yuhao Shen, Yi Pang, Ke Yang	Second Version of Project Charter
3.0	2019/09/29	Xu Zhang, Yuhao Shen, Yi Pang, Ke Yang	Third Version of Project Charter

1.2 Executive Summary

We are in an age where Fitbit and similar personal health devices and apps have become prevalent. Digital Health Inc. would like to be able to log what food a person is eating on a daily basis. Recently, Digital Health Inc. has posted an official RFB and they are already sending a draft of this bid to their existing suppliers. Our company has a lead who has been able to receive this RFB draft.

In our project, we prepare to build a highly scalable cross platform mobile app which uses Artificial Intelligence (AI) for food identification and calorie calculation and can achieve high accuracy.

The major milestones of our project will be: Project charter, Detailed plan & proof of concept, Demo and Final product. And key deliverables of our project will be: Login and Sign Up, Photo Taken for Food, Photo Analysis, Database update and Result Output. Finally, the key risks in our project can be: Performance, Time schedule, Requirement and client.

1.3 Authorization

This project charter formally authorizes the existence of the project, <Personal Food Log App>, and provides the project manager with the authority to apply organizational resources to project activities described herein. If there is a change in the project scope, the project charter will be updated and submitted for re-approval.

Xu Zhang

Full name Date: 2019/09/30
Project Manager

Yuhao Shen
Full name Date: 2019/09/30
Project Manager

Yi Pang
Full name Date: 2019/09/30
Project Manager

Ke Yang
Full name Date: 2019/09/30
Project Manager

Section 2. Project Overview

2.1 Project Summary

Our project is based on RFB posted by Digital Health Inc., which require us to develop a highly scalable cross platform mobile app which uses Artificial Intelligence (AI) for food identification and calorie calculation and can achieve high accuracy. We have four project managers in our team who are also stakeholders for this project.

2.1.1 Project Goals, Business Outcomes and Objectives

No.	Goals	Objectives	Business Outcomes
1	Food identification and calorie calculation	At or near the top of the list of existing VBM systems in terms of accuracy	Main selling point of our product
2	Ease of use and pleasantness	Achieve great pleasantness and ease of use	Bring good experience for our customers
3	Detect each food ingredient	Detect each food ingredient that is visually detectable	It can report the food ingredient which can perform better than other apps and can attract more customers
4	Assume that what exists on the surface of the food	The system can assume that what exists on the surface of the food, continues down to the bottom of it more or less uniformly	This can achieve higher accuracy for our food logging and become one of our main selling point
5	Calculate weight of each ingredient	Calculating the visible surface of the ingredient, then calculating the volume of the ingredient, and then using food density tables to convert volume to weight	This function and help our app better calculating calories in food and have better suggestion to our customers
6	Measure the actual dimensions of the image	Using auto-calibration techniques	Improve accuracy of our calculating
7	Highly scalable	Storage, processing, and communication need to be highly scalable	Can improve performance by using, and can customized by using
8	Cross-platform	The app itself should run on the most common mobile platforms: Android and iOS	Can be used by android and ios customer which expand our market

2.1.2 Project Scope

In our project, we prepare to develop a highly scalable cross platform mobile app which uses Artificial Intelligence (AI) for food identification and calorie calculation and can achieve high accuracy.

2.1.3 Boundaries

Activities In Scope	Activities Out of Scope
1. Food logging	Taking food pictures and analyze these pictures then save them in our database
2. Ingredient identification	Using deep learning technique to detect and identify food ingredients
3. Calculate calories	Based on ingredient identification and ingredient calories chart, calculating calories in food
4. Generate report	Generating a final report to user
5. Scalability	Using cloud computing platform to build backend service such as AWS
6. Cross platform	Using cloud computing platform to develop cross-platform product

2.2 Milestones

Project Milestone	Description	Expected Date
1. Charter	Finish project charter	09/30/2019
2. Project Plan	Finish detailed project plan	10/28/2019
3. Proof of Concept	Finish proof of concept	10/28/2019
4. Demo	Build the demo for our project	11/05/2019
5. Product	Develop final product	11/28/2019

2.3 Deliverables

Our final deliverable is an App for users to know their daily food take in as energy. We will have 5 main functions to achieve this goal. The most crucial ones are photo-taken and ingredients analysis. In order to have a more efficient algorithm to give a better user experience, we would apply deep learning in our database. We also want to have a profile for users, in case they want to have a long-term monitor of their daily food take in, this would be personalized. For the final result output, we want to have an intuitive conclusion, so we would have a verbal and graphical combination to give a final report of energy take. Details can be found in this chart.

Project Deliverable 1: Login and Sign Up	
Stakeholder:	● Digital Health Inc. Control the database of all registered users and their profiles. ● Personal Food Log App users. Input personal information to control data of their future food take in.
Description:	Sign up function for the first-time users, who want to have a long-term food record, to input their personal information, for example, height weight, age, etc., so that the Digital Health Inc. could have better user profile control for all the future data input. Login function for users who want to record their daily food take in.
Acceptance Criteria:	Single window, one form, two buttons to distinguish between login and sign up
Project Deliverable 2: Photo Taken for Food	
Stakeholder:	Personal Food Log App users. Take a photo of the food they take in.
Description:	A basic and fundamental function for our app, take a photo of food to have future analysis.
Acceptance Criteria:	One button on the homepage, get access to the camera and photo library.
Project Deliverable 3: Photo Analysis	
Stakeholder:	Digital Health Inc. Analyze all the food ingredients from the photo.
Description:	Distinguish all visible food ingredients from the photo, estimate the volume of each ingredients, and then get the weight of each and transfer to calories. This all done in the back-end of this App.
Acceptance Criteria:	Back-end analysis technology and calculate
Project Deliverable 4: Database update (Food Logging)	
Stakeholder:	Digital Health Inc. Update the ingredient database.
Description:	After each photo has been uploaded, check whether there is any new ingredient. If there is, update our ingredient database, so that the whole algorithm would be more efficient.
Acceptance Criteria:	Back-end Deep Learning technology.
Project Deliverable 5: Result Output	
Stakeholder:	● Digital Health Inc. Save current results to the database. ● Personal Food Log App users. Get a clear report of their energy takes in.
Description:	After analysis from the back-end, App users would get a clear report (verbal and graphical) of their energy take in, for example, calories, carbohydrates, etc. For the Digital Health Inc., they can check whether the users are logged in or not. If the status of the user is login, then save this to his or her personal record, and update the database.
Acceptance Criteria:	Single window, show the verbal and graphical result

2.4 Project Cost Estimate and Source of Funding

2.4.1 Project Cost Estimate (For Project Charter)

For our project cost estimate, we basically count cost of the project plan phase. Our project management team is a group of 4. We searched the average salary for Project Manager is about 96k CAD per year, so we use this as a standard to estimate our cost during the project planning stage. Future development and professional services, such as web or database service, are not included in this cost estimation.

Deliverables	Login and Sign up (3 days)	Photo Taken for Food (4 days)	Photo Analysis (7 days)	Database update (10 days)	Result Output (1 week)
Salary	3.4k CAD (4 project managers)	4.6k CAD (4 project managers)	8k CAD (4 project managers)	11.5k CAD (4 project managers)	8k CAD (4 project managers)
O&M	500 CAD	500 CAD	1000 CAD	1500 CAD	500 CAD
Sub-total	3.9k CAD	5.1k CAD	9k CAD	13k CAD	8.5k CAD
Total	39.5k CAD				

2.5 Project Risks, Assumptions, and Constraints

2.5.1 Risks

No.	Risk Description	Probability (H/M/L)	Impact (H/M/L)	Risk Management Plan	OPI
	Client not common to see	L	L	Accept,	
	Changes of Market	L	H	Transfer, Buy insurance	
	Inaccurate estimates of schedule	M	H	Avoid, Extend the schedule to eliminate	
	User's inaccurate expectations	L	M	Mitigate, Write Clearly user document	
	Team misunderstand requirements	L	M	Avoid, Communicate and clarify requirements in time and plainly.	

2.5.2 Assumptions

No.	Assumptions
	It is assumed that all the requirements fit the client's expectations
	It is assumed that all the Techniques involved in our project plan can be supported by the Health.ca In
	It is assumed that the 1st version can be delivered on time
	It is assumed that the process of project plan and app development respects the Private Policy
	It is assumed that the project is under the budget

2.5.3 Constraints

The following table lists the conditional factors within which the project must operate or fit.

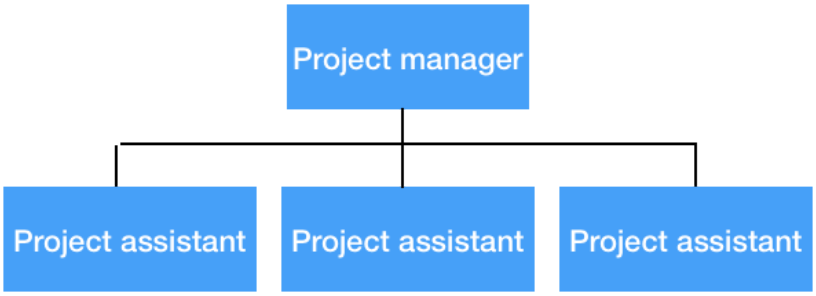
No.	Category	Constraints	
		Requirements	Client provide all the requirements
		Techniques	Development people comes from the Health.ca Inc
		Schedule	Fixed deadline for the Project Plan
		Private Policy	Compulsive policy to obey
		Fund	Predetermined budget

Section 3. Project Organization

3.1 Project Governance

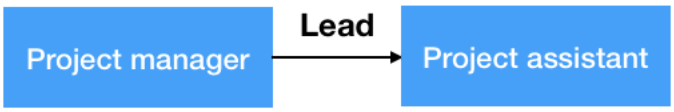
In this project, the project manager on duty for every week plans for every detailed thing should be done in this week. And three other team members (also called as project assistant) just follow his/her lead to finish their assigned work.

Everyone will be the project manager in rotation to train the ability of project managing.



3.2 Project Team Structure

Project manager leads project assistant



3.3 Roles and Responsibilities

Project Role	Responsibilities	Assigned to
[Project Manager]	Manage work for week 1	Yuhao Shen
[Project Manager]	Manage work for week 2	Yi Pang
[Project Manager]	Manage work for week 3	Ke Yang
[Project Manager]	Manage work for week 4	Xu Zhang
[Project Assistant]	Follow project manager's lead and finish assigned work	All team members

3.4 Project Facilities and Resources

Every week team members meet in the library to discuss week's work together, then due to the rotation of project manager, two project manager need to hand over the weekly plan to make sure the project process goes successfully.

Also, the project manager take charge in booking appointment with TA (as the project customer).

Section 4. Project References

More information concerning this project can be found in the following documents:

Document Title	Version #	Date	Author and Organization	Location (link or path)
You are what you eat: So measure what you eat!	IEEE Instrumentation & Measurement Magazine, vol. 19, no. 1, pp. 9-15	February 2016.	P. Pouladzadeh, S. Shirmohammadi and A. Yassine	https://ieeexplore.ieee.org/document/7384954
Mobile Multi-Food Recognition Using Deep Learning	ACM Trans. Multimedia Comput. Commun. Appl.	August 2017	Pouladzadeh, Parisa and Shirmohammadi, Shervin	https://dl.acm.org/citation.cfm?doid=3119899.3063592
Measuring Calorie and Nutrition From Food Image	IEEE Transactions on Instrumentation and Measurement, vol. 63, no. 8, pp. 1947-1956	Aug. 2014	P. Pouladzadeh, S. Shirmohammadi and R. Al-Maghrabi	https://ieeexplore.ieee.org/document/6748066
Using distance estimation and deep learning to simplify calibration in food calorie measurement	2015 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA)	Shenzhen, 2015	P. Kuhad, A. Yassine and S. Shimohammadi	https://ieeexplore.ieee.org/document/7158594?arnumber=7158594
A virtualization mechanism for real-time multimedia-assisted mobile food recognition application in cloud computing	Cluster Comput (2015) 18: 1099	2015	Pouladzadeh, Parisa Peddi, Sri Vijay Bharat Kuhad, Pallavi Yassine, Abdulsalam Shirmohammadi, Shervin	https://link.springer.com/article/10.1007%2Fs10586-015-0468-2

Section 5. Glossary and Acronyms

Term	Definition
O&M	orientation and management in short
Acronym	**Name in Full**
O&M	Orientation and Management