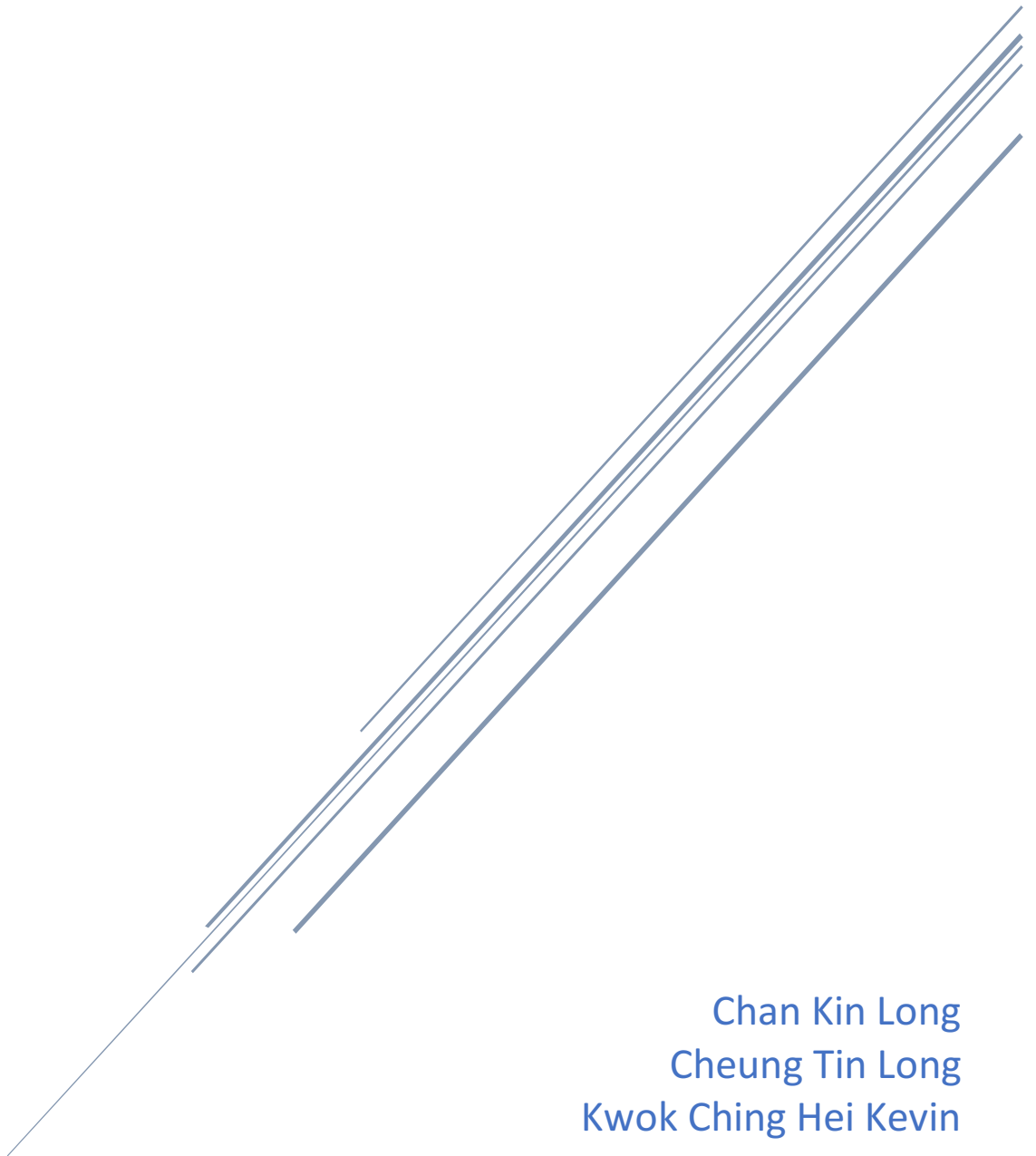# Final Year Project

Instant information sharing system

supervised by Dr T.W. Chim

Detailed Project Plan

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Table of Contents

1. Introduction

People always want to get instant information of different places: A hungry boy wants to know the immediate situation of restaurants nearby to avoid a long queue; Girls who planned to shop would like to know if the place was already crowded. Although there are already many popular communication applications for users to exchange information, we still find it hard to crave for instant information of certain places.

To satisfy all kind of curiosities, we will develop an instant information sharing system for requesting or uploading instant information by location and category. The deliverable of this project will be a real-time application to provide a platform for users to ask for the immediate situation of wherever they are curious about and retrieve the expecting information that are shared by users at certain places. It is hoped that the application will soon be widely used, so that it could satisfy our curiosity.

The first deliverable will include the authentication and the instant information uploading and retrieving at different locations, to ensure the system works properly for iOS/Android device users to register an account and share information by location. Later on, there will be more features to improve user experience in searching and looking for requests by categories. At the last stage, a user-friendly application will be completed.

2. Background

End-to-end information sharing has long been one of the main purposes of the development of information technology. Thanks to the breakthrough of

the development of internet, there were numbers of online platforms for internet users to share information such as blogs, forums and various public websites. The Internet serves as a large public "storage", from which user can search for whatever they want.

However, most of the websites and applications we are using nowadays are "static" [5]. That is, user has to send a request for new information such as pressing the key "F5" to refresh a certain website (see Figure 1). This is an unpleasant single-user experience, in which contents only change when user makes a request to reload the information [2]. Thus, we believe that a real-time service would be much more engaging.

In this regard, our system will take references from existing applications which real-time service, especially a real-time map, provided. For instance, a very popular game "Pokémon go" does include this feature (see Figure 2), updates of information will automatically pop up on the map such as new monsters or latest information of certain gyms.
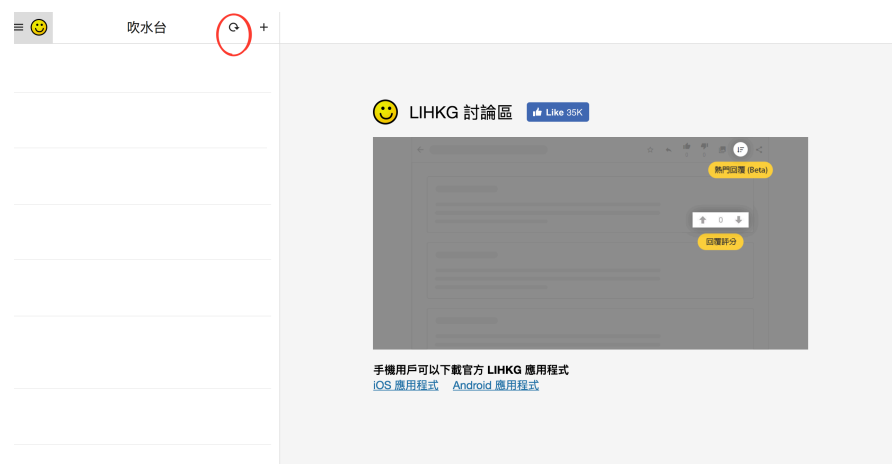

Figure 1 - a button implemented for refreshing new posts or comments in a popular forum LIHKG.

Figure 2 - a real time map implemented in popular game Pokémon Go.

3. Objectives

This project aims to provide a platform for iOS and Android device users to share instant information by location, allowing users to request for certain places and sending information at places that they are currently locating. The objectives of the projects are shown as follows:

1. Learn to handle a large-scale project with tremendous amount of interaction between the system and users.

2. Develop an application to tackle with daily life difficulties.

3. Understand the importance of user experience in the use of mobile
    application

4. Learn to develop a software product step-by step.

5. Implement a production-level application in terms of accuracy and
    concurrency.

6. Work as a team efficiently.

4. Methodologies

Theoretical and technological study

This part focuses on evaluation of the application of technologies.

It is common to build a mobile application using Xcode for iOS applications
with Objective-C or Swift as the languages and Android Studio for Android
applications with Java and Kotlin as the languages [4]. Yet it would be
problematic when we are going to build an application that serves to run on
both iOS and Android devices [3]:

1. The languages used in Xcode and Android Studio are completely
    different. Thus, two different codes have to be implemented for the
    same requirements but only different in platforms.

2. Maintenance of the application requires lots of effort. Since the codes
    implemented in two platforms are different, this may require two
    programmers who expertize in each language in order to maintain two
    versions of codes.

To get rid of the above problems, we will develop a React Native application. "With React Native there is no need to develop two different applications. The same code base can be used for both Android and iOS, and it even transforms the graphical elements to match the platform. [4] "

Besides, another important application of technologies in our project is Firebase. It is a mobile and web application development platform developed and provided by Firebase. We find it useful because of its convenience in developing mobile applications in a sense that several features are provided all-in-one. It is all-encompassing that it provides a real-time database, as well as it supports crash reporting, authentication, cloud function, cloud storage and hosting services.

5. Development environment

5.1 Hardware requirements

Hardware requirements mainly focus on implementation and testing, specially used for implementation of camera function and the layout of user-interfaces of iOS and Android version. In this regard, Android devices with version 7.0 or above were used for developing the Android version of the application. On the other hand, iOS devices with version 11 or above were used for developing the iOS version of the application. The functionalities and the design of user-interface of two versions will be made unanimous.

5.2 Software requirement

Software requirements mainly focus on the tools for database and development environment. In this project, Firebase is used to develop the mobile application. Since our application has a centralised database that is updated by a lot of users, Firebase is capable of handling the real-time data updated between devices. Moreover, Firebase allows data to be stored in the cloud and thus the data is readily available everywhere. More importantly, Firebase managed to host data so that users do not have to worry about the hardware requirement to load huge amount of data from the server [1]. Besides the use of Firebase, we used GitHub for version control. It is important to control the code that was developed by several developers. GitHub provides convenience in separate implementation and merging different versions of codes into one.

6. Teaming

Our team composes of:

1. Dr T W Chim, the supervisor of our project
2. Chan Kin Long, Cheung Tin Long and Kwok Ching Hei Kevin, year 4 students, major in Computer Science.

We regularly appoint meetings with Dr Chim to discuss about the process of our project and to ask for recommendation of the methodology. Internally, we divided our duties into three parts:

1. Requirements Implementation for mobile application
2. Design of visualization including App Icon, App logo and User-Interface.
3. Requirements Implementation for web application

7. Goals and Scope

7.1 Project Goals

Project Goal	Priority	Comment/Description/Reference
Functional Goals:	4(Least important)	
Sending requests to our system	3	Users who want to know the event or the situation in a specific region can make a request to the system
Sending notification from our system to app users in a specific region	4	The system then sends notifications to the users nearby.
Adjusting the range of notification	4	The range of getting notification from the location of the end user could be adjusted by the user
Uploading images with descriptions, locations and categories to our system	1	Users, notified by the system or not, can upload images to the system
Registration and Authentication	1	The system requires email confirmation.

Fetching data from database for Text representation	1	Images, with description, uploaded by other users would be shown.
Fetching data from database for Map representation	2	Latitudes and longitudes are retrieved from the database.
Settings	4	Settings of personal profile and application control.
Business Goals:		
Completing Application on time	1	Expected to complete and launch on the early January of 2018
Widely used by the public	1	Expected there will be around 100 active users (at least uploading five images to our system per day) in April, 2018
Technological Goals:		
Bugs-free react-native app		Users are able to load and upload new images.
Quality Goals:	2	
Concurrency	1	Ensure there would not be a concurrency issue: Allow multiple processes to access or change shared data at the same time

Performance	2	The visualization of data and the design of the user-interface are taken into account

7.2 Project Scope

This application basically provides a platform for instant information sharing. In this regard, the scope focuses on the form of information that our system provides for uploading. For details of other features such as the categories of information and the communication method between users, we are still in the consideration procedure.

7.2.1 Included

The system allows almost all events or things for sharing. Ranging from road conditions, food in restaurant, long queue in Mc Donald's and the class situation, our user can share whatever they want through the application and raise the others' attention. The included features of the application are as follows:

1. **User can upload post with texts and an image**

A post generally composes of an image and texts, in which more details or descriptions of the image can be included. The uploaded post will be delivered to our system and finally loaded by other users.

2. **Each post can be categorized to common areas**

Since there would be different types of post content uploaded by users, some users may not be interested in some areas. Therefore, the system provides default categories (e.g. Food & Beverage, transportation, entertainment) to which users can organize and relate their posts.

3. **User can search by category, hashtag and location**

The system provides a search field on the user-interface. Users can either search by inputting specific words or scrolling through the map to a specific location to look if there are new posts.

7.2.2 Excluded

The system has a strict rejection against improper images. In this regard, pornographic and violence are not allowed.

Our temporary plan for the scope of our system includes only text and image form as mentioned in the previous part. Depending on the user experience and feedbacks, other forms of sharing may be considered as new features to implement.

8. Schedule and Milestones

Milestones	Description	Milestone Criteria	Planned Date
M0	Start Project	Set up an environment for version control	2017-09-09

Milestones	Description	Milestone Criteria	Planned Date
	Project specification	Identify the main functionalities and features of the system	2017-09-09
M1	Start Planning Requirements	Identify detailed features of the system including the design of user interface	2017-09-09
	Deliverables of Phase 1 - Detailed project plan - Project webpage		2017-10-01
M2	Start implementation	Parts of functions and requirements implemented and parts of UI layouts made.	2017-09-09
M3	Complete Implementation	1. Workable application with all planned functions implemented and aesthetic UI. 2. Request for launching the application in app store	2017-12-15
M4	Release Product	Launched on app store	2018-01-01

Milestones	Description	Milestone Criteria	Planned Date
	Deliverables of Phase 2 - Preliminary implementation - Detailed interim report - First presentation		2018-01-08
M5	Maintenance	Ensure the application works smoothly without any bugs.	From the date of product release
	Deliverables of Phase 3 - Finalised tested implementation - Final report - Final presentation - Project presentation		2018-04-15
	Final Presentation		2018-04-16 – 2018-04-20
	Project exhibition		2018-05-02

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