CHAPTER 1

INTRODUCTION

1.1 Rationale of the Study

People of today – students and non-students alike – had a tight and hectic schedule. They do not have much free time. Instead of cooking food for themselves, they opt to eat lunch or dinner at food establishments. However, people sometimes get tired of eating the same food repeatedly, they found other food establishments nearby, but because of the time constraint they had, they were unable to explore the area they work or live in. The researchers also experienced this dilemma. Thus, the researches created a food establishment mobile locator called “Asa ta kaon?”

The users would not need to go out and explore the area to look for a place to dine in, but just open the app and all food establishments – including fast food, *carinderia*, etc. – was displayed on screen. The user can search the establishments displayed on screen based on the desired price and name of food establishment. Users who were unfamiliar of the area used the application’s feature, which provided them direction towards the food establishment. They also viewed the dining experiences of past customers of the food establishment so he or she had an insight of what kind of service the establishment provided. The registered users left their own description about their experience for the others to read and the food establishment to consider. Another advantage that registered users have over unregistered ones was that they can book for a table or seats in selected restaurants. This guaranteed them a secure seating, improved their dining experience. Customers also checked in the food establishment using the application to support their favorite food establishment. By doing this, it updated the place’s reputation by increasing the total number of the application’s user who availed their products and services.

This type of mobile application was beneficial to all the users, but also to the food establishment owners. If the establishment offered outstanding services and provided excellent dining experience to the customers, it immediately

spreaded through the community via the application's food establishment review feature. If the establishment performed rather below average on the other hand, they used the reviews as their basis on where to start improving their services.

"Asa ta Kaon?" is like a combination of Google Maps and a restaurant finder website such as Zomato. However, "Asa ta Kaon?" is a mobile application that does not require the user to open the web browser and is not limited to well-known restaurants or food place as it includes local *carinderias* such as the Mildson Ngohiong House near RD Pawnshop and the Golden Ladle.

1.2 Statement of the Problem

1.2.1 General Objective

This study aimed to develop a mobile application that helped users navigate and filter establishments around him that locates where he/she can dine within 200m radius as long as it is found in the specified scope.

1.2.2 Specific Objectives

1. Identified the possible food establishments within the user's location with a radius of 200m with the establishments that can be found in the specified scope.
2. Designed a mobile application that displayed 100 food establishments along the specified scope of the location.
3. Tested and evaluated the system.
4. Deployment of the Application
   - Created a local Web base App for the Admin.
   - An online mobile application for "Asa Ta Kaon" server is connected to the Firebase.

1.3 Significance of the Study

Many businesses nowadays found a way on how their business should be known by people. Most of them used social media sites and mobile applications for their advertisement.

This study was beneficial to the following:

Owners of Food Establishments. They may use this as a strategy of increasing their customers and to take action of the reviews given by the customers in order to improve the establishment.

Customers. They may be provided different varieties of food to choose from and discover new places they haven't tried before.

Students of University of San Carlos – Talamban. They may see this as a helpful way in locating new different establishments they haven't been to.

Future researchers. Who will be doing this kind of study especially those who are interested in creating a Mobile Locator that they may see this study as a guide or valuable reference in the future. This research would also help in understanding and analyzing the current status of the rapid growth of technology.

1.4 Scope and Limitations

This study aimed to create an Android mobile application that located and pinpointed food establishments within the user's vicinity. The application allowed the user to view information regarding the establishment's description, type of food served e.g. snack, rice meal; menu, price range, and reviews and ratings made by previous customers. The registered users rated an establishment and made a review about his or her dining experience. The application allowed them to book reservations for food establishments. Member or not they can search the food establishments to be displayed on the screen with price and name of food establishment. It is the discretion of the food establishment owner whether it may be a carinderia or restaurant that they would be accepting bookings.

The application covered only a limited area, which was along Gov. M. Cuenco Ave. starting from A.S. Fortuna intersection up to M. L. Quezon Ave. The system included at least 100 food establishments that included *carinderias*, restaurants, and snack houses, spreaded all throughout the area where the system covers. The application is limited with a mobile phone version of Android 7 and higher.

CHAPTER 2

RELATED SYSTEMS

In today's world, life is always on the move. With the fast evolvement of technology, smart phones today have great capabilities in providing a rich user experience with interactive facilities.

Food Finder

Zomato is a search and discover engine of restaurants that has been providing information to over 1.4 million restaurants in 24 countries. Aside from the search and discover they offer online ordering, food delivery, take out services and table reservations. Users can rate and review restaurants, which can make restaurants, become more known to other people. The developers of *Zomato* used to work in a company in Delhi and saw people in office cafeterias spend a lot of time looking for paper menus and because of that Foodiebay was created, but was soon afterwards renamed as *Zomato* (Goyal & Chaddah, 2011). ***OpenTable*** an online reservation service for restaurants based in San Francisco. Users can search restaurants by these categories' dates, time, cuisine and price range. When a user registers for the application, they will get a confirmation email. Another advantage of being a user is that they can receive reward points, which can be used for discounts at membered restaurants. Restaurant owners who avail to the application are subscribed to an Electronic Reservation Book (ERB) to replace the use of pen and paper reservation. The ERB will be the one who will handle the reservation, table arrangement, guest recognition and email marketing (Templeton, 1998). ***Urbanspoon*** an information and recommendation service. The functionalities of the system have a search engine that can filter prices from the cheapest to the most expensive, the type of food, neighborhood and special features like glute-free fares, child-friendliness and more. A user can like or dislike giving a feedback about the restaurant and could share the restaurants information via Facebook, Twitter and etc. Users who will register and join can track the history (Goldberg & Bogle, 2006). ***Yelp*** is a local-search service that develops hosts and markets.

Users can submit a review about their products or services by using the rating system, they can also react to reviews, plan and share about their personal lives, they can also make restaurant reservations and spa appointments, and order and schedule like manicures, flowers and etc. Establishments can update their contact information, what time they open and close and other information needed (Simmons & Stoppelman, 2004). ***Zagat*** a collect and match service by the ratings of establishments based in the US. Ratings that are only up to 30 from being the highest and 1 being the lowest which will categorize establishments according to the ratings; it also includes a short description from reviewers' comments about the service or establishment as well as the price. With a higher rate, an establishment can much more known from the rest (Zagat, 1979).

LocalEats a restaurant information and recommendation service based in the US and other international cities. The system filters restaurants by Top 10, Category Winners, All Picks, Cuisine, Neighborhood, Feature, Price Range, Hours and more. It also locates and finds restaurants nearby, can also make reservations and add these restaurants as a "favorite" for later use (LocalEats, 1996). ***TheFork*** allows a user to book a table in 40,000 restaurants worldwide. A user would have to enter an email and a zip code and will be validated. A user can also discover the top-rated restaurants around the neighborhood and can avail exclusive discounts up to 50% off. A search engine limited to finding the address, restaurant name and neighborhood along with the date, time and people if ever you want to have a reservation (Kaufer, 2000). ***Rezku*** the implementation of research and development in restaurant management made by Guest Innovation. With *Rezku* POS system, restaurant owners and managers are able to handle the inventory, finances, accounting and staff. The software helps the user track food waste, audit the inventory to see if there are losses. The user can also create and implement the schedule of the staff, the number of hours the staff has worked and keeping the slots for your employees filled. They also offer order and tableside services, marketing and promoting, and gift cards (Katsch, 2014). One of the famous websites in the Philippines

that will guide you to the country. ***Dinr*** a reservation mobile app that will help a user in their last-minute diners based in Canada. A user will just have to create an account and is notified when a customer cancels which will give them the opportunity to have that table reserved and be the first one to know when the very hard reservations can become available (Nares, 2014). ***Restaurant Guide*** is a GPS based android application, which helps the user to locate Hotels nearby the current location and order the items available in the respective hotels. The app tracks the user's current location with google maps API, which provides nearest hotels available. The app shows hotels within a 3 km distance from the user's location. The user can also view the menu and order available items by emailing the hotel (Nepali et al., 2012). **Food Finder - Mobile Food Ordering** is an online food ordering system that enables the customer to place their order at anytime and anywhere. The reason to develop the system is due to the issues faced by the food industry. The application contains different types of food varieties available for the user to buy through online, another thing it can do is that it allows to quickly and easily manage online menu which customers can browse and know how much he/she can spend (Ashish et. Al. 2018). **An Examination of Customers' Adoption of Restaurant Search Mobile Applications** is a restaurant-related mobile app that has gradually replaced computer-based restaurant service websites. Many restaurant operators have realized the essence of developing a restaurant-related mobile app that can meet the consumers' needs (BAI, 2015).

Hotel & Restaurant Locator

TripAdvisor is a user-generated content adopter that shows hotel and restaurant reviews, bookings and travel-related content. The website has functionalities of booking for a hotel, the check-in and out and the number of rooms and the number of guests. The other functionalities book flight tickets or dinner reservations, it also has a functionality called "things to do" where you can look or get ideas for your next adventure. A user can log-in and register, once a user logs in they can manage their shopping carts and trips, they are also given an inbox where they can message another person, they can also

give feedbacks or read feedbacks of a certain restaurant, airline, hotel and etc (Kaufer, 2000). ***Foursquare*** a local search-and-discovery service mobile app that provides search results for users. The system has features like local search and recommendations just by entering the name of the location and displays recommendations based on time of the day, breakfast places during the morning and dinner places in the evening and it is based on the user's history, and their tastes and venue ratings and friend reviews. A user can write short tips about the place to make other users aware of the restaurant and add photos or a URL. The user can also like tips by other users and follow brands or users and users can add venues to a "to do list" (Crowley & Selvadurai, 2009).

Navigation Locator

Waze gives more than just one directional path that is based on GPS navigation software that works on smartphones. A user will have to type in their destination address after searching and selecting, users will just drive and listen to what the computer will say; users can also inform other fellow wazers about accidents, traffic jams and police traps that will help them in order to avoid being stuck in traffic. The waze map gathers and collects data, the travel time and traffic information from users transmitting it to the server (Shabtai, Shinar & Levine, 2006). ***Google Maps*** a web mapping software that contains satellite imagery, street maps, a 360-degree panoramic view of the street, the real-time traffic updates, and route planning for people walking, riding, or driving. Google Maps also offers an Application Programming Interface (API) which allows the map to be redirected to other third-party sites, a locator for urban businesses. It works based on the Global Positioning System (GPS) that is a satellite based radionavigation system that provides geolocation and time information to a GPS receiver anywhere in Earth (Page &Brin, 2005). ***Be-On-Road*** packed with features for travelling on the road and GPS tracking that will help users with the fastest route and a closed source application for offline usage. The software has features that will display a map in 2D or 3D, road segments can be blocked in order to avoid navigation, offline address search; smart differentiation of place names that could occur twice in a country or region, online address search

which allows you to locate the geographical data not found when offline, multi-language voice navigation, speed limits and route calculations (Be On Road, 2015). ***Global Positioning System Based Location Finder on Android*** is a smart phone application that uses location-based information and concepts of a multiplying reality to enhance a user's experience. It keeps track of the user's location in real time. Whenever the user points the phone in any direction, the application updates its camera view by showing the tag with additional information of buildings and places in the exact location of where a user is (Tahir, 2015). ***Sygic*** a navigation system for mobile phones and tablets with GPS, a touch screen and audio signals. The GPS navigation can be used online and offline offering for more than 200 countries in 30 different languages. Users can download maps to their devices and can use them offline. The system provides real-time traffic information, and can direct users to other street routes (Stencl et. al, 2004). **Trip Tracker Application on Android** is an Android based application which obtains the geo-location. This application is developed to provide users by having the information of a specific location (Reddy, 2011).

Security Locator

Life360 a family networking application that is a location-based service which allows friends and family members to share their location and communicate with one another for both web and mobile. The software has features of location sharing, circles, places and premium. Location sharing can let users open the application and locate where their friends and family are. Users can select if they want to share their location or not from a particle circle and time. Circles separates groups within the app. Users can create geofences which will alert them that another user has entered or left that specific location and users can also use the premium app if they want additional features like stolen phone insurance, emergency speed dial and etc (Hulls &Haro, 2008).

Table 1

Summaries of Related Systems

	LOGIN/ REGISTER	SEARCH ENGINE	FEEDBACK/ RATINGS	USES GPS	BOOKING/ RESERVATION	NAVIGATION	MENU
ZOMATO	✓	✓	✓	✓	✓		✓
OPENTABLE	✓	✓	✓	✓			✓
URBANSPOON	✓	✓	✓	✓	✓		✓
YELP	✓	✓	✓	✓			✓
ZAGAT	✓	✓	✓	✓	✓		✓
LOCALEATS	✓	✓	✓	✓			
THEFORK	✓	✓	✓	✓			✓
REZKU	✓	✓	✓	✓	✓		✓
TRIPADVISOR	✓	✓	✓	✓	✓		
DINR	✓	✓	✓	✓	✓		✓
FOURSQUARE	✓	✓	✓	✓			
WAZE	✓	✓	✓	✓	✓	✓	
GOOGLE MAPS	✓	✓	✓	✓		✓	
SYGIC	✓	✓	✓	✓		✓	
LIFE360	✓	✓	✓	✓		✓	
BE ON ROAD	✓	✓	✓	✓		✓	
"ASA TA KAON?"	✓	✓	✓	✓	✓	✓	✓

Login/Register – allows user to register their basic personal information and login to gain access to the system.

Search Engine – allows the user to easily search for an establishment and price range.

Feedback/Ratings – allows the user to leave a comment and rate the food establishment's service.

Uses GPS – allows the user to give out his/her location at the moment.

Booking/Reservation – allows the user to reserve/book a table online.

Navigation – guides the user on how to get to the establishment.

Menu – allows to user to view the menu of a specific food establishment like their price.

CHAPTER 3

TECHNICAL BACKGROUND

API (Application Programming Interface)

API or Application Programming Interface is an intermediary software that allows two (2) programs or application to communicate with each other. It serves as the bridge between the user and the system. The API relays the user's request to the system and then delivers the requested output by the system to the user.

GPS (Global Positioning System)

GPS or Global Positioning System is a navigation system that utilizes the numerous man-made satellites orbiting the earth. It was first introduced and used by the US military during around 1960s. It was then introduced to the world at around a decade later. Nowadays, most vehicles and devices are GPS capable, which means it can be tracked down by anyone given the proper tools and knowledge. In order to obtain a vehicle or device's location, it is required to receive signal from at least 3 of the numerous satellites present just beyond the earth's atmosphere; this process is called 'triangulation'. Although using only three (3) satellites can yield an object's location, connecting to additional satellites give a better and accurate result.

Geolocation

Geolocation is the process of finding or locating an object's exact location by using its geographical coordinates and measurements. Geolocation utilizes the GPS to provide the object's whereabouts. Aside from GPS, Geolocation can also utilize an object's IP (Internet Protocol) Address and MAC (Media Access Control) Address.

Backend as a Service

Backend as a Service or also called as BAAS. It handles activities that take place on the servers, such as push notifications, database management, remote updating, user authentication, as well as hosting and cloud storage.

Front-end development

Front-end web development also known as client-side development is the practice of converting to graphical interface for user to view and interact with data through digital interaction using HTML, CSS and JavaScript.

Database Management System

The Firebase Realtime Database is a cloud-hosted NoSQL database that lets you store and sync between your users in realtime.

React Native

Let’s you build mobile apps using only JavaScript. It uses the same design as React, letting you compose a rich mobile UI using declarative components.

CHAPTER 4

DESIGN AND METHODOLOGY

This chapter has discussed the conceptual framework, which introduced us to the new proposed system, analysis and user interface, and the design model of our proposed system.

4.1. Conceptual Framework

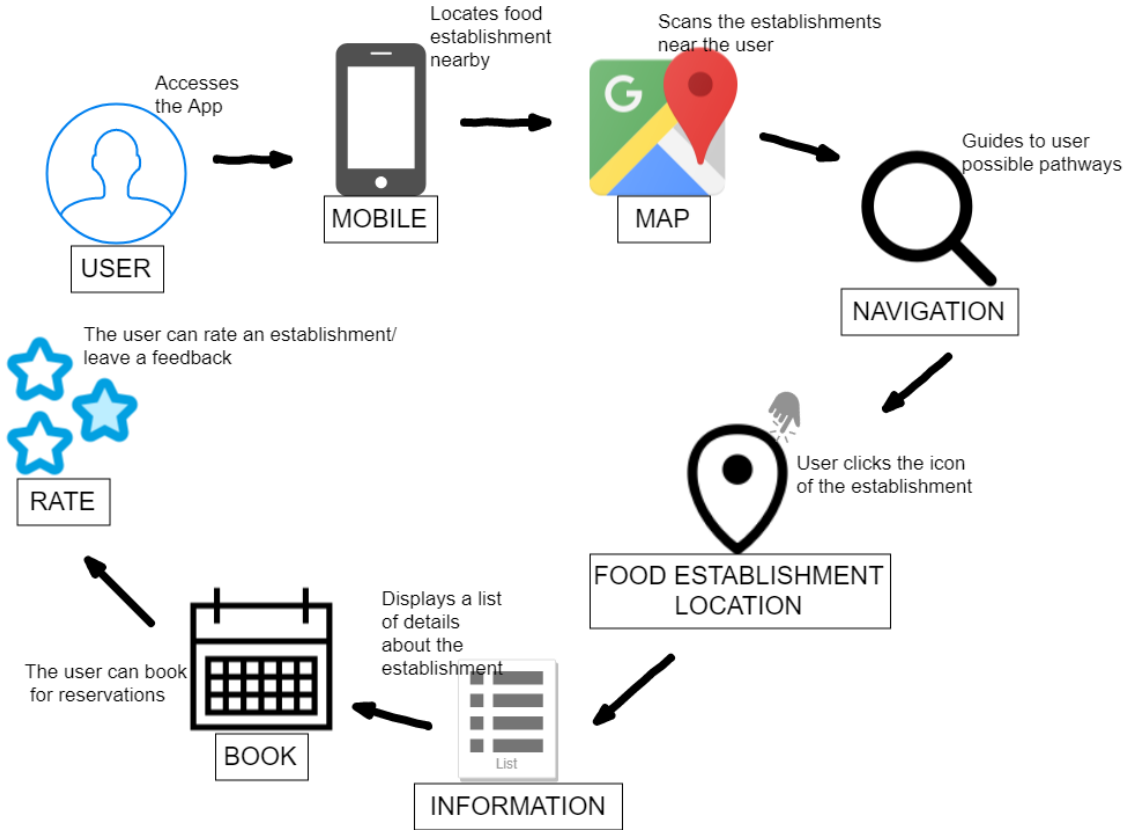

Figure1. Conceptual Framework – User's Side (Mobile)

In figure 1, it was based on the user's side where the user accessed the app and the app tracked the GPS of the user and scanned the food establishments from the selected places. Once the user had selected a particular food establishment it provided the user with information about that specific establishment and would book the restaurant. After the user has eaten

in that establishment, he/she can rate the establishment for future diners to know.

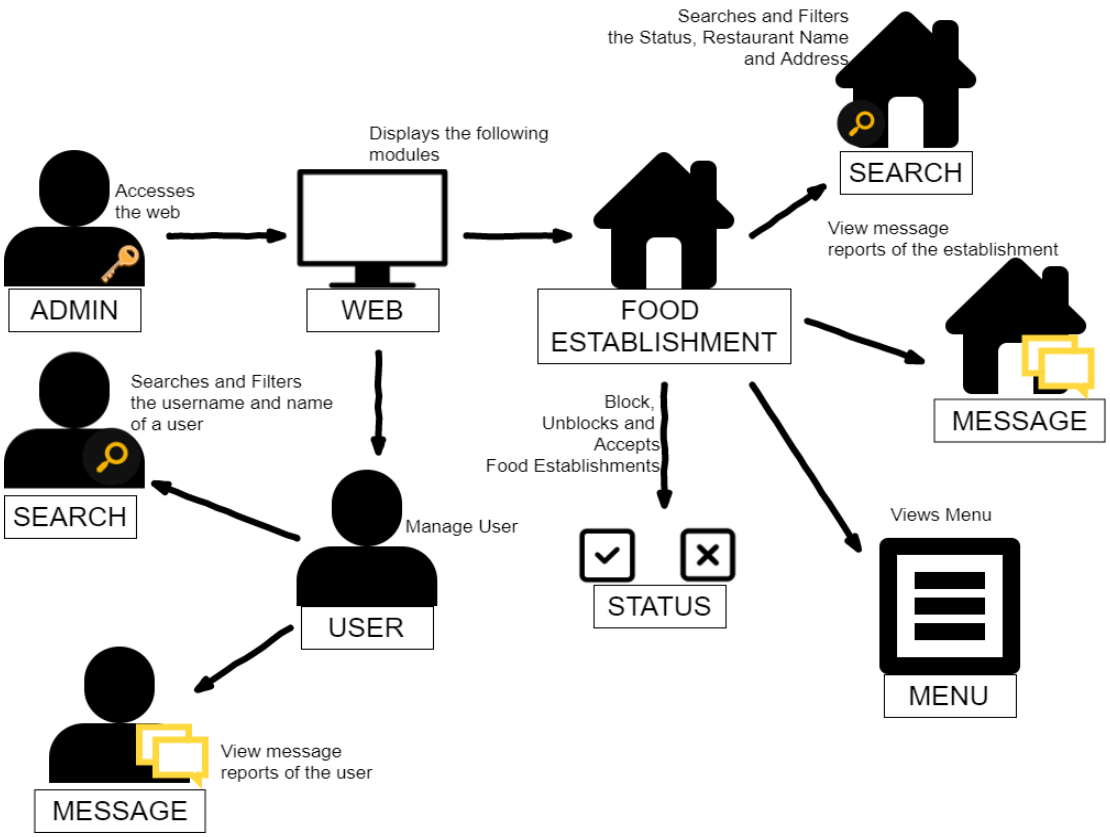

Figure2. Conceptual Framework – Admin's Side (Web)

Based on Figure 2, it was made as a Web for the Admin's Side where the Admin can do CRUD on both the User and Restaurant and can also search and filter for both operations. For the module of the User the Admin can check message reports and search by filtering their name and username. For the module of the Restaurants the Admin can accept when there is a newly registered Restaurant, block if the Restaurant has done something wrong and Unblock, can also check messages from a Restaurant and search by filtering their restaurant name, address and status.

4.2. Analysis and Design

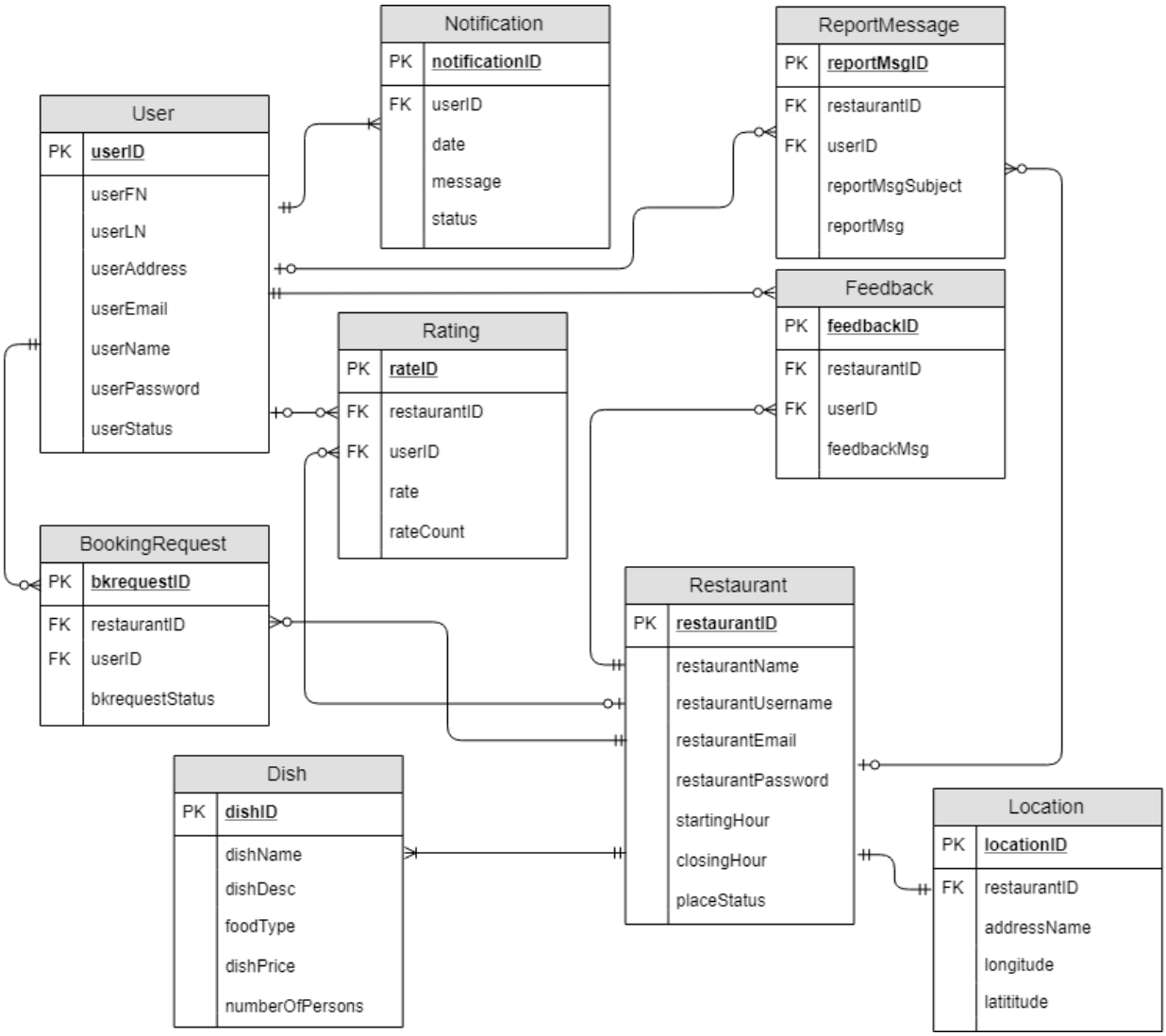

Figure 3. Entity Relationship Diagram

In figure 3, It was possible to use the "Asa ta Kaon?" food locator mobile application without making an account. Although this was permitted, there were limited features available to the unregistered users compared to those with registered accounts. An unregistered user was allowed to locate a food establishment and view its description, but reservation and viewing of reviews made by other users was not allowed. It also had a search engine that search out the likes of the user, if the user search price the system would display all

food establishments that had the price range chosen. It sorted what would be the budget of the user.

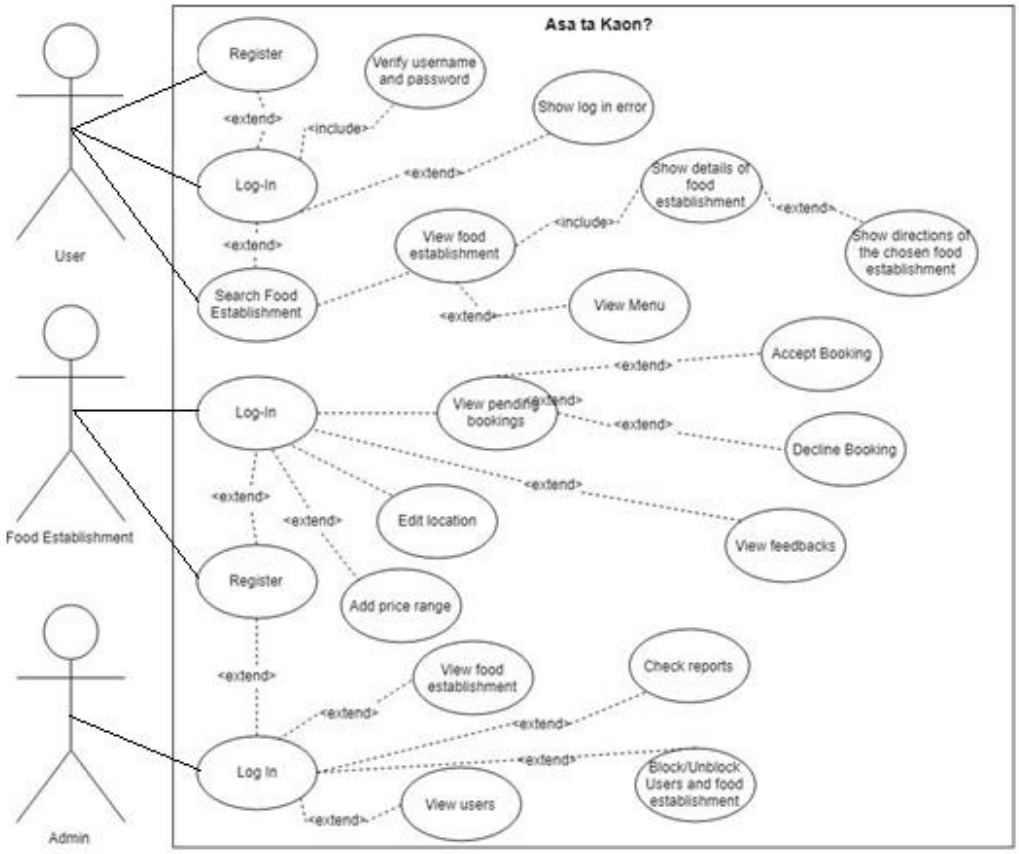

Figure 4. Use Case Diagram

In figure 4, the user can easily register if they don't have an account, they can log in if they have an existing account, and they can search food establishments directly we have a search engine so that the user can decide what type of food the user wants. The log in function has included relationship to verify username and password so that the system can see if the user is registered. It also has extended relationship to show log in error so that if the user's credentials are not known to the system, it would display an error sign. Once the user is in our system, they can only see log in function, register function, and search food establishment function. Once the user would click

search food establishment it would go to the next page which displayed food establishment, where they can see the food establishment what they searched for. Once the view food establishment is entered, the show details of food establishment was also entered which was the details of the specific food establishment. The last function was the show direction to the chosen food establishment, here the user saw where the chosen food establishment was located and they pin pointed where they are. The admin side is controlled on a web page. The admin can only validate, check food establishment reports, and view information of user and food establishment accounts.

4.3. Development Model

The process design of this research aims to use the agile process model.

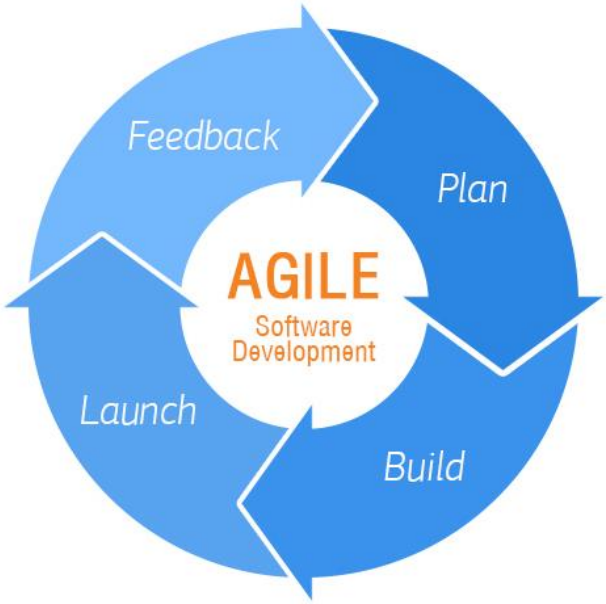

Figure 5. Agile Development Model

Planning Phase, brainstormed and shared new ideas happened in this phase. Through this process, the proponent clarified priorities, defined project goals and understood the needs of the consumer.

Building Phase, through a combination of brainstorming and collaboration, combined research, design, elements, features and concepts from the concept generation phase and merged them into single-focused ideas

and designs and the creation of the modules began, to build up, grow, or improved gradually over time. The previous phase had outputted by following the model. The system was created by its modules following the development approach of top-down.

Launching Phase, distributed the final version of the application, once the Test ended and the application was evaluated by the public.

Feedback Phase, the proponents gathered and implemented the feedback to meet their expectation and to improve our system.

4.4 Development Approaches

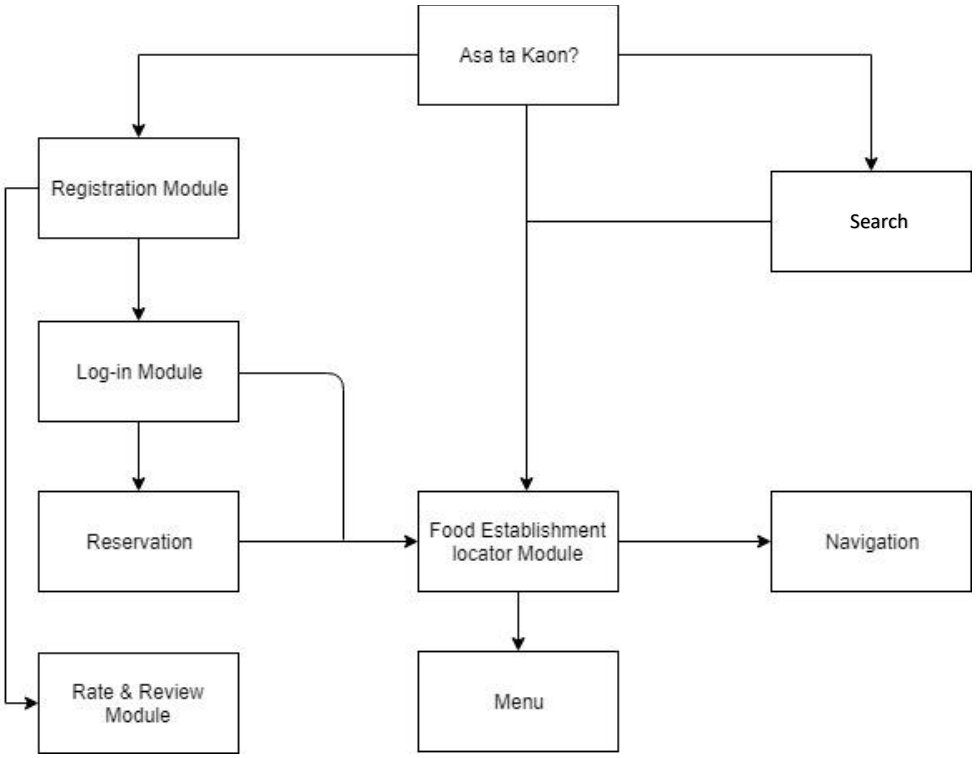

Figure 6. Top Down Approach for User

As shown in figure 6 the approached used was the Top Down approach where the flow started from the top until it reached and complimented the needs of the required modules until the bottom.

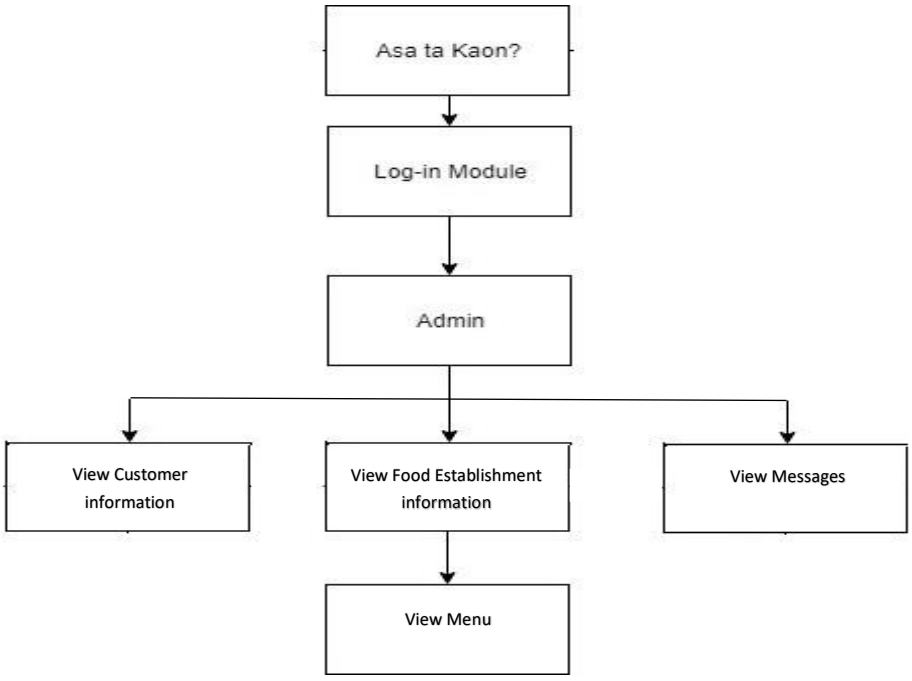

Figure 7. Top Down Approach for Admin

As shown in figure 7 the approached used was also Top Down approach where the flow started from the top and until it reached and complimented the needs of the required modules until the bottom.

4.5 Software Development Tools

Table 2

Software Tools used in the implementation of the system

Software	Version	Usage
Java Development Kit	3.2.2	It will store user credentials to let the admin know what the user's details are.
Android Studio	3.2.1	It will let the admin build codes so that the app will be created.
Firebase Platform	3.1.1	It is a cloud database. It will store data of the user in a real time database once the user has done registering.

Sublime	3.2.1	It will help the admin to code the back end and front end of the system.
Google Maps	10.13.4	It integrates the street view of the user and locates and searches food establishments.
Android SDK (**software development kit**)	Android 9	is typically a set of software development tools that allows the creation of applications for a certain software package, software framework, hardware platform, computer system, video game console, operating system, or similar development platform.
Node.js	10.15.3	It is designed to build scalable network applications.

4.6. Project Management

This section will present the Schedule and Timeline, the Responsibilities and the Budget and Cost Management.

4.6.1 Schedule and Timeline

Table 3

Gant Chart of Activities, 1st Semester 2018-2019

Month	September				October				November				December			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ACTIVITIES																
Plan																
Brainstorming																
Module Planning																
Research																
Project Documentation: Chapter 2																
Project Documentation: Chapter 3																
Design																
Project Documentation: Chapter 4																
Project Documentation: Bibliography, Appendices, and Cv																
Submission of Proposal Document																
Capstone Proposal Defense																
Submission of Revised Document																

Table 4

2nd Semester 2018-2019

Month	January				February				March				April				May			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ACTIVITIES																				
Build																				
Login/Registration Module																				
User Information																				
Food Establishment Information																				
Comment/Rating Section																				
Map Side																				
Navigation Side																				
Booking Side																				
Admin Side																				
Filter Side																				
Launch																				
Test Login/Registration Module																				
Food Establishment Information																				
Comment/Rating Section																				
Navigation Side																				
Filter Side																				
Booking Side																				
Test Whole System to a User for Testing																				

Table 5

Summer 2019

Month	June				July			
Week	1	2	3	4	1	2	3	4
ACTIVITIES								
Feedback								
Capstone Defense								
Revisions								

4.6.2 Responsibilities

Table 6

The proponents with their corresponding modules and responsibilities

MEMBER	ROLE	MODULE
Barral, Alda Zoe Kenji	Programmer	Mobile Side: Log in /Registration Module Map and Navigate Food Establishment Filter Module

Pasignasigna, Stephanie	Programmer	Admin Side: Log in module Accept/Blocked Food Establishment Module Mobile Side: Feedback & Rating Module
Rosal, Marnel	Programmer	Mobile Side: Food Establishment Information Module
Valdez, Franchesca Dominic	Programmer	Admin Side: Blocked User Module Messages Module Mobile Side: Booking Module

4.6.3 Budget and Cost Management

Table 7

Total cost of expenses for the project

Expenses	**Cost**
Printing	P 5,000.00
Laptop	P 25,000.00
Food	P 1,500.00
Transportation	P 500.00
Miscellaneous	P 2,500.00
Total	P 34,500.00

4.7 Verification, Validation and Testing

In order for the proponents to come up with a better system, they had to know the preferences of both the consumers and the food establishment owners. The proponents conducted a survey via questionnaires aimed at both the consumers and the owners of the food establishment. The questionnaires contained a series of questions probing on their preferences regarding the factors that affected the decision whether they eat in a specific food establishment or not. On the food establishment owner's side, the questionnaire's content was different. It would ask about their needs and or their suggestions to increase their customer influx.

The proponents also conducted a black box testing, which was a software method that tested the system's overall functionality. The testers were unaware of the internal structure, design, or implementation. The proponents intend to have the proposed system to be tested by 5 individuals. The application will also undergo (UAT) or User Acceptance Testing wherein it was given to 30 selected users who were our potential clients. The purpose of which was to uncover bugs and problems that may be have been overlooked from the previous test done to the system. Conducting this test ensured the developers to release a smooth, usable, and fully functional application to the public. The evaluation of the results made by the testers was used to improve the would-be developed system before being released for public consumption.

CHAPTER 5

RESULT AND ANALYSIS

This section is the presentation of the capability of the system and the discussion of the result of the objectives.

5.1 Data Gathering

The researchers have gathered around 100 food establishment as long as the location is found in the scope. Through conducting an interview to each food establishment asking for permission that they would be included in the system they were to sign an agreement. 105 establishments have agreed and handed out their information like Menu and Location, while 10 other establishments declined to be part of the application.

5.2 Systems Design

Systems Capability

- The application can pinpoint food establishment along Gov. M. Cuenco Avenue to M.L. Quezon Ave.
- The application can navigate the location of the food establishment along Gov. M. Cuenco Avenue to M.L. Quezon Ave.
- The application can filter the type of food, price range and business hours of the food establishment.
- The application can display the information and menu of the food establishment.
- The application can manage booking from the food establishment, only the registered users are allowed.
- The application can provide rating and comments for the feedback.

Major Modules

The proposed system has the following major modules:

- Map

    - Food Establishment – it provides different food establishment being display along Gov. M. Cuenco Avenue to M.L. Quezon Ave.
- Navigate – it helps the customer to navigate where the food establishment being select located.
- Filter
    - Price - it will then search the price of each food establishment.
    - Name of Food Establishment - it will then search the name of food establishment.
- Notification – the food establishment owner can accept or reject the customer's booking.
- Booking – it will allow registered users to book in the food establishment.
    - Claimed
    - Unclaimed
    - Delete
- View Restaurant Information
    - Name of Food Establishment
    - Business Hours
    - Price Range
    - Food menu
- Feedback/ Rating– it allows users to give comments and rating after eating in the food establishment.
- Validation – it allows the admin to accept or decline the request of the food establishment to be placed in the map.
- Restaurant/Customer Information – it will then display in the admin side.

See Appendix E for the detailed Functional Requirements.

5.3 Testing and Evaluation

Verification (Black box Testing)

The "Asa ta Kaon" A food establishment locator mobile application was tested last April 4, 2019 – May 3, 2019 by the following testers:

- Joshua Silao

- Arnella Gonzales
- Alyssa Loreto
- Elixir Cubelo
- Herald Castro

After executing a test, the decision was defined according to the following rules:

- Acceptable – The test sheet is set to “Acceptable” status if the actual result meets the expected result.
- Not Acceptable – The test sheet is set to “Not Acceptable” status if the actual result does not meet the expected result.

There are 23 test cases being tested by the testers.

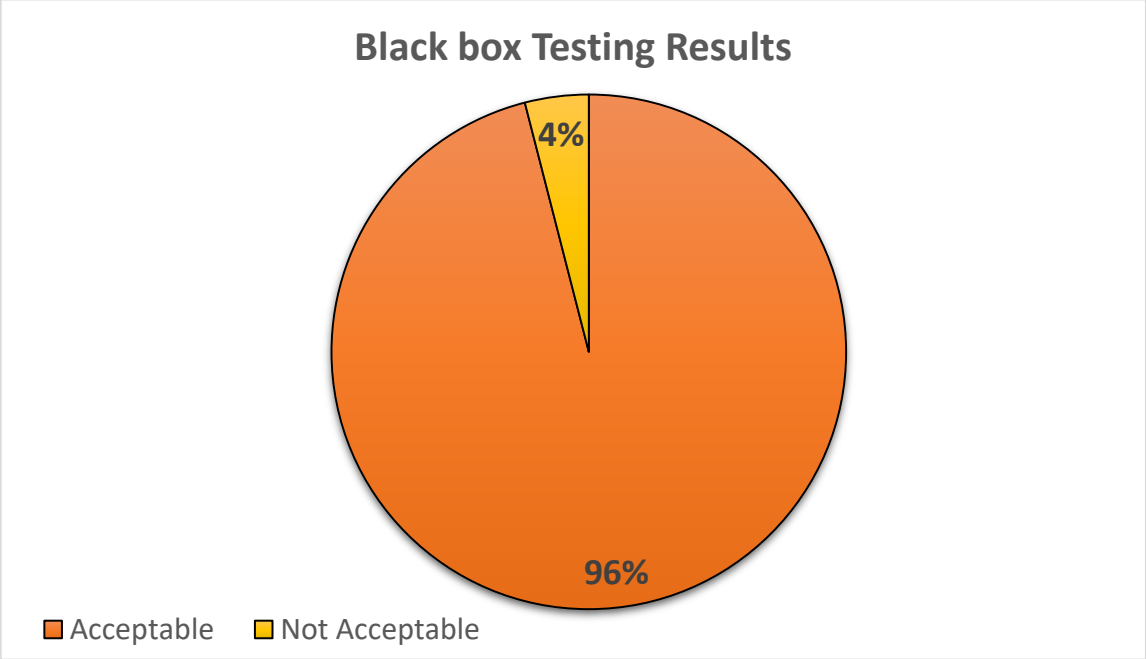

Figure 8. Black box Testing Result

Based from our Black box testing, we have accumulated with an average score of 96% out of 100% for our overall system. The 96% result has been accepted as Acceptable while the 4% is Not Acceptable. This was based from each modules’ overall functionality and so far, for each module, it has progressed with the expected result, but the 4% does not meet our expected results because

there were other functionalities that did not match the expected results in the Search Bar Module because at that time it was not yet complete and only displayed the Price Range of the establishments and cannot search yet for the Food Establishment's name. Before Proceeding to the UAT all the bugs were fixed.

See Appendix F for the detailed and Sample Test Cases (Black box Testing).

Validation (User Acceptance Testing)

The "ASA TA KAON" A FOOD ESTABLISHMENT LOCATOR MOBILE APPLICATION underwent user acceptance testing last May 3, 2019 by the following users of the system (10) Food establishment owners or managers (20) randomly chosen customers of the food establishments.

The system was tested based on functionality, reliability, usability, efficiency, maintainability, support and manuals.

Table Summary:

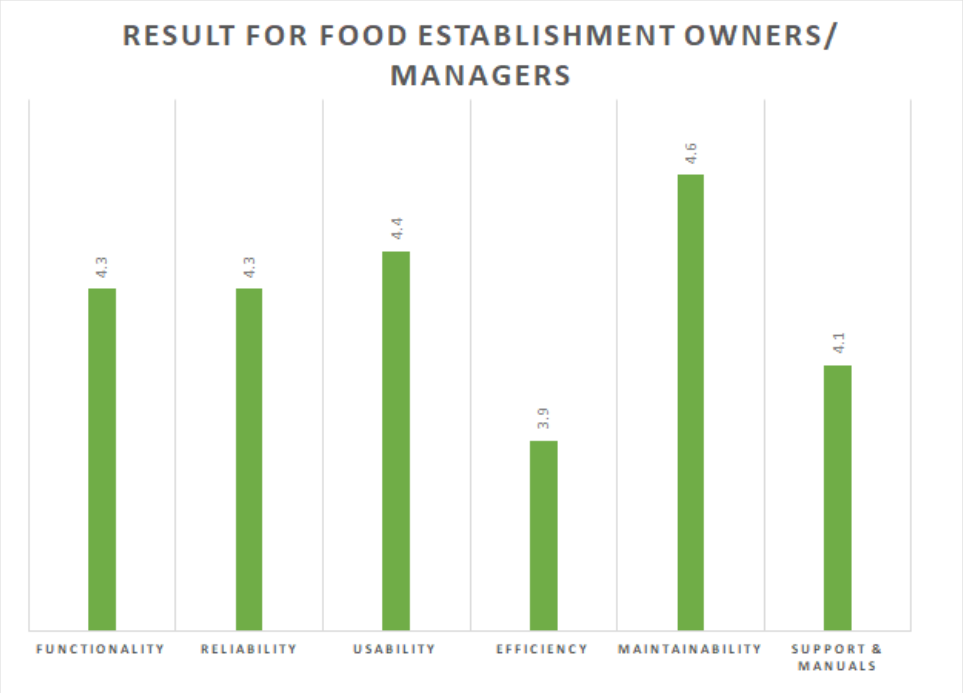

Figure 9. Result for Food Establishment Owners/ Managers

Based on Figure 9 of the result of the Food Establishment Owners, it is divided into 6 categories. These categories are Functionality, Reliability, Usability, Efficiency, Maintainability, and Support and Manual. Each category is scored depending on the application's performance. After the scores were given, it was calculated to get the average, which is the overall score of the application.

Functionality

This category refers to the actions performed by the modules of the application. It was rated based on the actual output versus the promised output of the module. The average score in this category was 4.3. This is derived from 6 testers giving a score of 4.5, and 4 testers giving a score of 4. Overall, the testers were satisfied with the actual outputs of each module of the application, which is reflected on the high score attained by this category.

Reliability

This category refers to the data management of the application. This category was rated based on its ability to store new data and retrieve existing ones, and also the application's ability to filter erroneous entries. The average score received by this category is 4.3.

Usability

This category refers to how easy it is to use the application. This category was rated based on how user-friendly the application is, how straightforward it is to use the application, and how easy it is to navigate from page to page. The average score received by this category is 4.4. Testers said that it was easy to learn how to operate the application. The flow of the application and its function was not complicated, according to the testers. Few concerns were raised by the testers. One was that page to page navigation could be improved by allowing users to go back to the previous page with the use of the phone's own back button. The other concern was that the user interface was "bland and dry". It didn't have any designs and embellishments aside from the welcome page.

Although this does not affect its functions, it would affect its attractiveness to potential users.

Efficiency

This category refers to the application's startup speed, system requirements, and performance. This category was rated based on how easy the application is to load its components, how fast it accomplishes actions, and the system requirements it needs to run smoothly. The average score of received by this category was 3.9. The scores given by the testers had more variation compared to the other categories because the test was done using the testers own device. The devices' specifications varied from tester to tester. Some users had high-end phones, while some did not.

Maintainability

This category refers to how easy to install and test the application is. This category was rated based on how easy it is to test and, distribute and install the application is. The average score received by this category was 4.6. Although the application was not deployed on the google play store, it was still easy to distribute the application to the testers via the use of a file transfer application. Testing the application with sample data was also easy according to the testers.

Support and Manuals

This category refers to the application's manual and instructions. This category was rated based on how helpful and understandable the application's manual. The average score received by this category received was 4.1. This is because the testers said that the user's manual was a bit unnecessary because the application was already pretty straightforward and easy to use, but the contents of the user's manual was useful nonetheless.

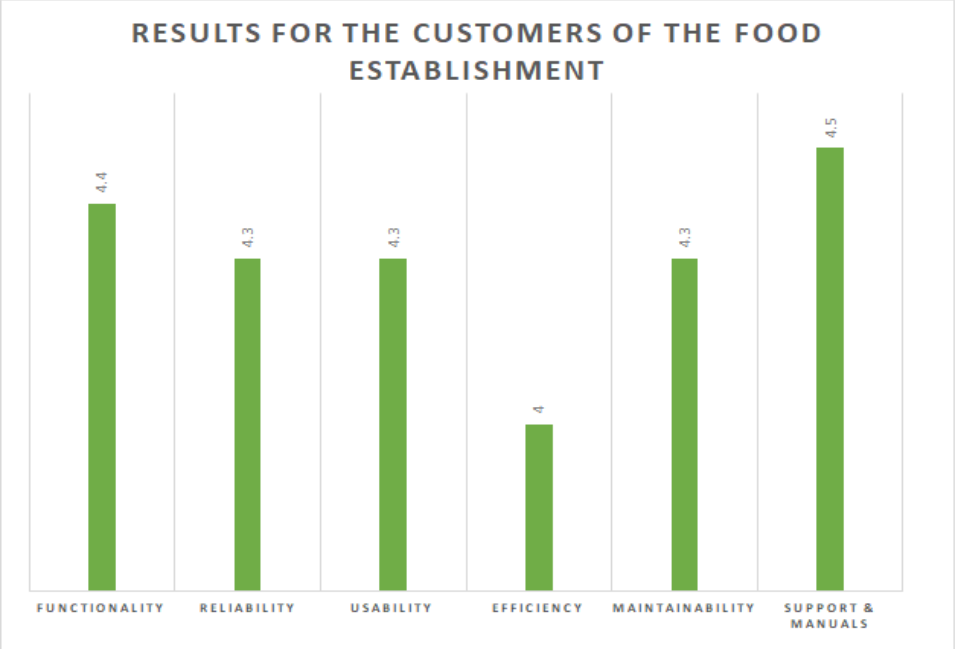

Figure 10. Result for the Customers of the Food Establishment

Based on Figure 10 for the result of the customers, it is divided into 6 categories. These categories are Functionality, Reliability, Usability, Efficiency, Maintainability, and Support and Manual. Each category is scored depending on the application's performance. After the scores were given, it was calculated to get the average, which is the overall score of the application.

Functionality

This category refers to the actions performed by the modules of the application. It was rated based on the actual output versus the promised output of the module. The average score in this category was 4.4. The testers were satisfied with the performance of the application. It performs the tasks and outputs the results it was expected to display. The only issue raised was that some of the testers experience it slower compared to the other testers due to the phone they are using.

Reliability

This category refers to the data management of the application. This category was rated based on its ability to store new data and retrieve existing ones, and also the application's ability to filter erroneous entries. The average score received by this category is 4.3. The testers were also satisfied with the application in terms of reliability. Registration and logging in is simple and straightforward. The areas to be filled out contain guides and clarifications such as what to input, and input format.

Usability

This category refers to how easy it is to use the application. This category was rated based on how user-friendly the application is, how straightforward it is to use the application, and how easy it is to navigate from page to page. The average score received by this category is 4.3. Testers said that it was easy to learn how to operate the application. The flow of the application and its function was not complicated, according to the testers. Few concerns were raised by the testers. One was that page to page navigation could be improved by allowing users to go back to the previous page with the use of the phone's own back button. The other concern was that the user interface didn't have any design aside from the welcome page.

Efficiency

This category refers to the application's startup speed, system requirements, and performance. This category was rated based on how easy the application is to load its components, how fast it accomplishes actions, and the system requirements it needs to run smoothly. The average score of received by this category was 4.0. The scores given by the testers had more variation compared to the other categories because the test was done using the testers own device. The devices' specifications varied from tester to tester. Some users had high-end phones, while some did not.

Maintainability

This category refers to how easy to install and test the application is. This category was rated based on how easy it is to test and, distribute and install the application is. The average score received by this category was 4.3. Although the application was not deployed on the google play store, it was still easy to distribute the application to the testers via the use of a file transfer application.

Support and Manuals

This category refers to the application's manual and instructions. This category was rated based on how helpful and understandable the application's manual. The average score received by this category received was 4.5. This is because the testers said that the user's manual was a bit unnecessary because the application was already pretty straightforward and easy to use, but the contents of the user's manual was useful nonetheless.

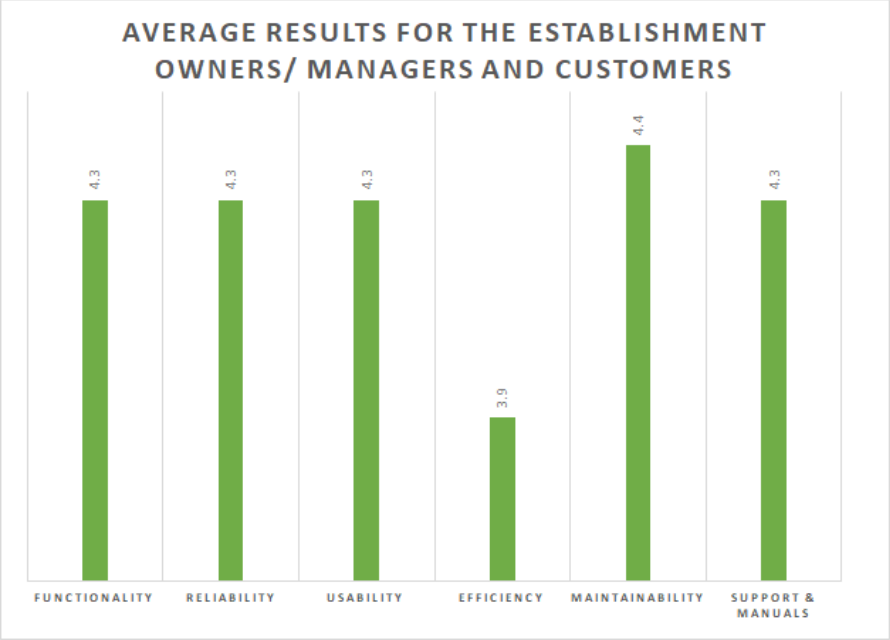

Figure 11. Average Results for the Establishment Owners/ Managers & Customers

Based on Figure 11, it is divided into 6 categories. These categories are Functionality, Reliability, Usability, Efficiency, Maintainability, and Support and Manual. Each category is scored depending on the application's performance. After the scores were given, it was calculated to get the average, which is the overall score of the application.

Functionality

This category refers to the actions performed by the modules of the application. It was rated based on the actual output versus the promised output of the module. The average score in this category was 4.3. This is derived from 6 testers giving a score of 4.5, and 4 testers giving a score of 4. Overall, the testers were satisfied with the actual outputs of each module of the application, which is reflected on the high score attained by this category.

Reliability

This category refers to the data management of the application. This category was rated based on its ability to store new data and retrieve existing ones, and also the application's ability to filter erroneous entries. The testers were also satisfied with the application in terms of reliability. Registration and logging in is simple and straightforward. The areas to be filled out contain guides and clarifications such as what to input, and input format.

Usability

This category refers to how easy it is to use the application. This category was rated based on how user-friendly the application is, how straightforward it is to use the application, and how easy it is to navigate from page to page. The average score received by this category is 4.4. Testers said that it was easy to learn how to operate the application. The flow of the application and its function was not complicated, according to the testers. Few concerns were raised by the testers. One was that page to page navigation could be improved by allowing users to go back to the previous page with the use of the phone's own back button. The other concern was that the user interface was "bland and dry". It

didn’t have any designs and embellishments aside from the welcome page. Although this does not affect its functions, it would affect its attractiveness to potential users. Half of the scores given are within the “Very Acceptable” range. And the other half are in the “Acceptable” range.

Efficiency

This category refers to the application’s startup speed, system requirements, and performance. This category was rated based on how easy the application is to load its components, how fast it accomplishes actions, and the system requirements it needs to run smoothly. The average score of received by this category was 3.9. The scores given by the testers had more variation compared to the other categories because the test was done using the testers own device. The devices’ specifications varied from tester to tester. Some users had high-end phones, while some did not.

Maintainability

This category refers to how easy to install and test the application is. This category was rated based on how easy it is to test and, distribute and install the application is. The average score received by this category was 4.6. Although the application was not deployed on the google play store, it was still easy to distribute the application to the testers via the use of a file transfer application. Testing the application with sample data was also easy according to the testers.

Support and Manuals

This category refers to the application’s manual and instructions. This category was rated based on how helpful and understandable the application’s manual. The average score received by this category received was 4.1. This is because the testers said that the user’s manual was a bit unnecessary because the application was already pretty straightforward and easy to use, but the contents of the user’s manual was useful nonetheless.

Average Score Interpretation:

4.1 – 5.0 = Very Acceptable
3.1 – 4.0 = Acceptable
2.1 – 3.0 = Moderately Acceptable
1.0 – 2.0 = Not Acceptable

Average Score: 4.25

The criteria is basically a standard on which it is used for judging how a system works accordingly by (1) Functionality – the quality of being suited to serve a purpose well, (2) Reliability – the quality of being trustworthy or of performing consistently well, (3) Usability – the degree to which something is able or fit to be used, (4) Efficiency – the state or quality of being efficient, (5) Maintainability – the ease with which a product can be maintained in order, (6) Support and Manuals – give assistance to; enable to function or act. Being rated from 1.0 Not Acceptable to 5.0 Very Acceptable.

The application has accumulated an average score of 4.25 based on the Score Interpretation it was “Acceptable”. Based from the results found in Table 10 Maintainability has obtained the highest average score over 4.4 from both the Establishment Owners and Customers because it measured the ease and speed with which the system can be restored to operational status after a failure occurs and Efficiency accumulated with the lowest total average score of 3.9 because some of the inputs used in the system did not work accordingly to the expected outcome. It also did not perform uniformly on all kinds of devices. Some of these devices had a difficulty running the application.

See Appendix G for the detailed User Acceptance Testing.

5.4 Deployment

The researchers have not deployed the system through any cloud means like Google Play Store. Although all the data that has been acquired by the system was stored on the Firebase. Since the researchers have not deployed the system the application can be used through file transfer with a mobile version of 7 and above. The web application was locally deployed.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

This section is a summary of the results and discussions This section also provides a statement about the possibility of future researches. This chapter can be discussed based on four major parts:

Summarizing the Results

The results and findings of the tests conducted are discussed in this chapter. The tests conducted by the proponents were the Blackbox test and the User Acceptance test. The Blackbox testing or Alpha testing's purpose was to find out the program's functionalities' expected outputs when run under certain conditions, and was conducted by 5 testers. The User Acceptance Testing or the Beta Testing was performed in order to measure the program's rating in terms of functionality, reliability, usability, efficiency, maintainability, and support and manuals, done under a consumer's perspective. The beta test was done by 10 food establishment owners, and 20 customers.

Putting the Results into Context

According to the tests conducted, both the Blackbox testers and the User Acceptance testers, the application was acceptable. As shown at figure 7, the program had a rating of 96 percent acceptable, and only 4 percent not acceptable. The application delivers almost all of the functions it promises the users to do. Meanwhile for the User Acceptance Test, all the testers were satisfied with the performance of the application, which reflects on the overall average score. The application had a rating of 4.24 as average score given by the restaurant owner beta testers, and a rating of 4.29 as average score given by the customer beta testers. All in all, the overall average score of the application, both the restaurant owners and customers result taken into account, it has an average score of 4.27. It is evident that the application was well received by the testers, and was satisfied by how it functioned.

Evaluating the Process

If the application was to be released for public usage, it would be a tremendous help for them, both for the restaurant owners and consumers. Having a simple application that can help you decide where to eat, and allows you or your group to reserve seats, if the establishment allows it, can reduce the time you use for thinking about where to eat. This time saved can be used in other important things. The restaurant owners will have an influx in customers, knowing that the establishment they own serves great food and offers great service, which will be seen at the establishment's profile in the application. The owners of the establishment can also become a better food stop, and increase its customers by improving on what the comments about them made by its patrons. The research and tests done by the proponents can be of a big help to those who intend to develop an application with functions similar to "Asa ta Kaon?".

The proponents chose to let 30 people, partitioned into 2 groups, to conduct the User Acceptance test so that the data gathered will be precise. This is contrary to the Blackbox test we conducted, where it only had 5 participants. Although the Blackbox test was a success, it is not as precise, and as detailed as what the User Acceptance Test yielded.

Identifying Future Work

Of the objectives the proponents had in mind since the beginning of this project, A lot of accomplishments have been made. The application we had envisioned was brought to life, and would be ready to be released to the public. Although it is not the same as what the proponents really had in mind, it functions the same just the way the proponents thought it would be. But there are also obstacles the proponents encountered. One of these are some of the food establishment owners choose not to cooperate with us, despite the benefits it could bring to them. Another obstacle is that some owners are people who do not delve into the technological advancements of our time, thus giving the proponents a hard time to reach their targeted number of establishments to

register in the application. If the proponents had more time, resources, and experience, the proponents would have done a great deal of performance improvements and did a few more tests in order to refine the application in to a better one.

GLOSSARY

This section of the capstone document provides operational definitions of key terms that appeared in "ASA TA KAON" A FOOD ESTABLISHMENT LOCATOR MOBILE APPLICATION that aimed to develop a mobile application that displays all food establishments within the vicinity of the user as used in our study.

Carinderia is a food stall with a small seating area, typically in a market or at a roadside.

Criteria is a principle or standard by which something may be judged or decided.

Efficiency is the state or quality of being efficient.

Fast Food is a quick service restaurant that prepares & serves food quickly.

Food Establishment is an operation that stores, prepares, packages, serves, vends food for human consumption; is in an on or off premises and there is charge of food.

Functionality is the quality of being suited to serve a purpose well.

Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world.

Locator is a device or system for locating something, typically by means of radio signals.

Maintainability is the ease with which a product can be maintained in order.

Menu is a list of dishes available in a restaurant.

Mobile Application is a computer program, or software application designed to run on a mobile device, such as a smartphone or tablet computer.

Navigation is the process or activity of ascertaining one’s position and planning and following a route.

Price Range is the highest and lowest prices recorded within a given time on a market.

Rating is a classification or ranking of someone or something based on a comparative assessment of their quality, standard or performance.

Reliability is the quality of being trustworthy or of performing consistently well.

Reservation is the act of reserving chairs and tables in a restaurant.

Reviews is a formal assessment or examination of something with the possibility or intention of instituting change if necessary.

Search Engine is a program that searches for and identifies items in a database that responds to the keywords or characters specified by the user, used especially for finding particular sites.

Support and Manuals is give assistance to; enable to function or act.

Usability is the degree to which something is able or fit to be used.

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