

KINDER FOOD FINDER

Project Proposal



THE UNIVERSITY OF
SYDNEY

Information Technology Capstone Project

COMP5703/5707/5708

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ABSTRACT

Public concerns over animal welfare have increased; Nowadays, people pay attention to the living condition of livestock and provide more support to brands which adopt moral husbandry practices. However, ambiguous branding and packaging could render all those supports irrelevant. As a result, this project is deployed as a solution to provide consumers a mean to access reliable information source regarding animal welfare and grant concerned researcher (The client in this case) a tool to analyze shoppers' behavior in animal welfare context.

The project focuses on developing a mobile application which lets users search for animal welfare rating of different brands (Rated by professional organizations), report stores function which has a relevant brand and find stores function which is closed to their location. To accomplish all the fundamental functions mentioned above, the key deliverable of this project shall include (1) a mobile application, (2) server and database and (3) instruction on how to manage the app and server. Hence, due to the timeframe limitation of the project, the mobile app will be compatible with Android operating system only. Accordingly, as a significant number of users could access the mobile app, it is vital to ensure the quality of this project; As a result, the project team decided to adopt waterfall software development life cycle methodology since it provides a standard and reliable framework for the project. Finally, at the end of the project, source-codes of the application and server will be delivered to the client, and a training session will also be conducted to ensure the client is well equipped with the necessary knowledge of the products.

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1. INTRODUCTION

- Animal welfare is a new concept introduced to the livestock industries; the terminology refers to how animals or livestock is coping with the living conditions (Agriculture Victoria Services, 2017). Hence, various aspects of the animals' living conditions are considered to guide people on reassuring the well-being of animals, for example:
 - Physiological needs of animals like foods and water should be provided;
 - Safety needs of the animals should be satisfied;
 - Animals should not suffer from any pain, disease or injury. Hence, prevention and treatment to afflicted should be conducted;
 - Animals should be allowed to interact with members of their species socially.
- As the livestock industry evolves, public concern for animal well-being also increases (Butterworth, 2018); Not only do people pursue animals welfare individually, but different organizations (Chen, 2016) have risen together with government to enforce animal welfare practices. Hence, different standards and policy regarding the well-being of livestock were developed to harmonize and streamline animal welfare legislation.
- Even though public concerns for animal welfare in food product have increased significantly, consumers still struggle to align their shopping decisions with personal values. This is due to ambiguous product labels, marketing claims; Hence, in the absence of a convenient information channel to support consumers, distinguishing an animal-friendly brand among various options is exhausting. Giving the current conditions, even though supports for animal welfare continual to increase, the efforts could not reach the appropriate channels and are vanished into the hollow.
- This project aims to reduce the gap between consumers' attitude and behaviors by providing consumers with an information channel regarding animal welfare; In specific, as smartphone has invaded more into our life, it also becomes a part of our world, the source of our entertainment and social connectivity (Shahzad & Alwagait, 2013). Furthermore, while allowing people to carry it around due to its compact size, the device also grants people access to various information channels. Taking into account the advantages of a smartphone, we want to develop a mobile application which allows users to access information related to animals welfare and enable consumers to make the right decisions regarding their beliefs.

2. RELATED LITERATURE

2.1 Literature Review

The ethical consumption dilemma:

- According to Futerra's (2005) report, there is a difference between the consumer buying intention numbers and actual purchasing numbers of the consumers when it comes to ethical products. In other words, while most of the consumers are conscious in the moral side of their consumption, not many of them are acting upon it by buying ethical products like free-range poultry or organic food instead of regular industrial products.
- Moreover, Connolly & Shaw (2006) also discovered that while the consumer awareness on ethical issues is growing, the actual purchasing does not change proportionally. Therefore, it could be said that the consumer conscious of ethical consumption does not reflect the sale number of these products. So where does it go wrong? And what could be done to reduce the gap for the consumer?

An intention-behavior gap explanation:

- To explain this phenomenon, Carrington, Neville, & Whitwell (2010) have proposed to apply the purchase intention and consumer behavior gap theory into the situation. They explained that there are five main types of factor which influence the transmitting process which is: (1) physical surroundings (store location, product placement, etc.), (2) social surroundings (staff interaction, etc.), (3) temporal perspective (time of purchase, time constraint), (4) task definition (buy for self or someone else, gifting, etc.) and (5) antecedent states (financial situation, product pricing, etc.) (Carrington, Neville, & Whitwell, 2010). Later, another research by Ghvanidze, Velikova, Dodd, & Oldewage-Theron (2016) also confirmed a similar framework for the explanation. The group discovered that a consumer intention would also be affected by personal needs and motivations when transmitting into purchasing action (Ghvanidze, Velikova, Dodd, & Oldewage-Theron, 2016). This is further explained in the research of Bray, Johns, & Kilburn (2011) where they used an online survey to look into what the consumers consider as a barrier for buying the ethical product. There are seven factors that prevent the consumer from purchasing ethical product which is: (1) price sensitivity, (2) personal experience, (3) ethical obligation, (4) lack of information, (5) quality, (6) inertia and (7) cynicism (Bray, Johns, & Kilburn, 2011). As a result, it could be said that the gap between

consumer intention does not reflect his / her purchase, but it is a result of various environmental and situational factors.

How to increase ethical consumption:

- As it is shown that the consumer decision is affected by various factors, it is essential for the consumer to be well informed about ethical products. According to research using diary approach by Papaoikonomou, Valor, & Ginieis (2018) has also shown that most consumers rely heavily on the quality and quantity of the information about the product to make their purchases. However, when it comes to marketing purpose, not all messages affect consumer behavior the same. Andorfer & Liebe (2015) experiment on fair trade coffee sales in Germany has shown that within three main types of in-store incentives: (1) promotion, (2) additional information and (3) appealing to consumers' moral obligation, only the monetary stimulus is sufficient for increasing the sale of the product. The finding has shown that most of the marketing efforts are less effective when it comes to consumer in-store purchasing behavior (Andorfer & Liebe, 2015). Therefore, it is vital for ethical product information to be easily accessed by the intended consumers.

Mobile application and ethical products:

- To provide more information to the consumers about ethical products, in recent years, there have been multiple mobile applications which dedicate for moral consumption purpose like Good on You, Shop Ethical!, Etc. These applications promote the use of an ethical product by informing the consumers on what product is moral as well as helping them to plan out their purchase. How practical are mobile applications in term of reducing the intention-behavior gap of the consumers? What makes mobile apps a new trend for ethical consumption?
- According to Fuentes & Sörum (2019), the main reason why mobile applications like Green Guide, Fair Trade app and Shopgun (which were analyzed by the researchers) are suitable for promoting ethical consumption is because of the how they could put pressure of moral obligation on the consumer on individual purchase level by allowing the users to search and note down their ethical product purchasing intention. In other words, mobile applications work as they affect the social obligation aspect of consumers. Besides, in their research on Buycott app, Eli, Dolan, Schneider & Ulijaszek (2016) has discovered that the application is practical because it provides the consumer with a peer to peer

platform for conversation and review which create the community aspect for ethical consumption. This is appealing to the consumers as peer information is considered more trustworthy due to the abundance of marketing message nowadays. Moreover, with the collectivism creating by the community, the mobile application could also, in turn, create a collective bargaining power for the consumers when dealing with stores and manufacturers about ethical consumption. However, this would also become a problem of mobile applications for ethical consumption. In their analysis of thirty-two different ethical consumption applications, Nghiem & Carrasco (2016) have found that the best applications would require an official authoritativeness and a transparent and objective rating for the products. This fact is also supported by findings of Humphery & Jordan (2018) which showed that misleading rating would cause the ethical purpose of the application to go to the wrong directions. Therefore, while mobile apps are a powerful tool to promote ethical consumption, a cautious stance must be used to ensure the expected benefits for the consumers.

Conclusion:

- In conclusion, there is an intention-behavior gap of the consumers when it comes to purchasing ethical products as the consumers are affected by various factors when making their purchase (Carrington, Neville, & Whitwell, 2010). Therefore, to ensure consumer commitment, they should be given more incentive than just awareness of the ethical obligation. A very powerful tool for this cause is mobile applications as they could (1) help the consumers search and note down their planned purchase (Fuentes & Sörum, 2019) and (2) bolster a community for ethical consumption through peer to peer conversation and review (Eli, Dolan, Schneider, & Ulijaszek, 2016). Nevertheless, the mobile applications are to be used with care and require an official authoritativeness and a transparent and objective rating (Nghiem & Carrasco, 2016); otherwise, the collective purchasing power of the ethical consumers could be easily misguided (Humphery & Jordan, 2018).

3. RESEARCH/PROJECT PROBLEMS

3.1 Research/Project Aims & Objectives

- The objective of this project is the development of a user-friendly mobile application which provides users access to animal welfare conditions information of several animal-source products and helps users conveniently locate where to find these products through sourcing products' selling points. In specific, the application enables users to report where they see a particular product and let other users access that information.
- In summary, the objective is to provide consumers access to breeding conditions behind the specific product and to locate accredited products through a mobile application.

3.2 Research/Project Questions

- Firstly, the reason behind this project is that the client wants to enrich her research with more data from actual consumers of the animal-sourced products and analyze those data to test several hypotheses. In order to collect a large number of data from users, technology should be employed to ensure the efficiency of the process. In this case, the client chooses mobile application as technology. In specific, due to the mobility and convenience qualities of a mobile device, a well-developed app shall enable users to access rating of animal-sourced brands anytime, anywhere. Furthermore, the software is also capable of recording users' usage pattern and reporting to the client. That is to say; the application will serve as a tool to help users search for information and conveniently document a report for the client.

3.3 Research/Project Scope

a. The project scope of work includes:

- Development of a mobile (Android) application and a server which could provide users with ratings of animal source food based on the living condition of the animal.
- The mobile application is expected to be user-friendly and cover the following features:
 - Signup/ Login function: Users should be able to use their Facebook account to log in and use the service provided. Otherwise, users can choose to sign up for a new account;
 - Search function: Enable users to search through products in the database and examine the rating of a product;
 - Browse function: Allow users to browse by (1) Category, (2) Accreditation and (3) Rating to find welfare ratings for animal-source products;

- Search for a product in store: Enable users to scan through the stores available in the database and check which stores have a specific product;
 - Recommend stores which have the product: Enable users to provide a recommendation on which stores have a particular product;
 - Collect and display data: Data collected from users' behaviors should be recorded in the database and can be extracted by the administrators;
 - Input new product and rate product: Enable the administrators to enter new product and rate product in accordance with the animal living condition;
 - The mobile application and website should be user-friendly. Hence the mobile application interface should be like "Good on you" mobile app.
- The server will have the following features:
 - Brand Database for the application: The server will consist of a real-time database for the application. In specific, the application can access the real-time database and update (Adding, Updating, Deleting) welfare ratings for animal-sourced -products when the internet connection is available;
 - Users' behavior Database: Beside storing animal welfare rating information, the server will also store users' behavior data. The mobile app will collect users' behavior search history and store that in the local database; When the internet connection is available, the data will be transferred to the server;
 - Administration: The server will have some built-in features to enable the administrator to manage both databases (Query, Insert, Update, Delete data in the database). Hence, the administrator will be able to access this function using an Admin account.
 - Instruction on how to administer the mobile application and website must be documented to assist the client in managing the system.

b. The project scope of work does not include:

- Any adjustments related to the application after the project team finishes delivering the final products.
- Daily administrating of the mobile application server after the deployment phase.
- Any sales and marketing activities directed to end-customers.

- Further purchasing of software and hardware besides the software and hardware specified in this project.

4. METHODOLOGIES

4.1 Methods

- For the project, we have decided to use the waterfall methodology. This is the model where the software development process follows a linear pathway; The methodology breaks down the project into five different phases: (1) Requirement analysis, (2) Design, (3) Implementation, (4) Testing (5) Release/ Deployment and (6) Maintenance (Brindha & Vijayakumar, 2015). The standardized process of the waterfall model could be explained as followed:
 - Requirement analysis: This is the first stage of the project where the team would engage the client and gather the project requirement or problem description as well as the project scope and constraints (i.e. timeline, project team, budget, etc.). This stage would include multiple meetings and contact between the team and the client side to ensure a thorough analysis of the requirement.
 - Design: After the project team has fully understood the project scope and requirements, the team would move on to the next stage where the developer would transform the technical and function requirements of the product into designed programming feature. Besides, related resources such as server or platform would also be planned and purchased by the project team.
 - Implementation: When the client approves the final design, the developers will start creating the new solution according to the design. At the end of this stage, a fully functional product would be created.
 - Testing: Following the implementation stage, the project team would also need to conduct a series of test on the product. This stage is required to ensure product quality before being transfer over to the client.
 - Release/Deployment (Bomarius & Komi-Sirviö, 2005): This stage is not usually presented in the traditional version of waterfall development life cycle model; However, per request by client, in this stage, the project team will work closely with cthe lient to transfer knowledge and resources related to the project to cthe lient. In specific, the project team will conduct training to cthe lient before passing on the

products. In addition, instruction will be documented and delivered to the client at this stage.

- **Maintenance:** Finally, during the life cycle of the product, regular maintenance would also be needed to guarantee the performance of the product as well as the implementation of further update or modification. However, due to the nature of the project, this stage would be handled by the client side.
- The following is the reason why we have decided to choose this method over other software development method like Agile:
 - ***Clear definition of the problem and product requirement:*** With the project brief provided by the client, we believe that we have an apparent description of the problem as well as the client requirement on the final delivered product. Furthermore, there has been a similar project on ethical consumption rating app such as goodonyou.eco which have been successfully implemented. This would allow the waterfall methodology to be more efficient than another method.
 - ***Project time constraint:*** As the project would need to be done within the thirteen weeks of the semester, the waterfall method would allow us to be more efficient with the time without the necessity of going through different iterations like other methods such as Agile. Also, with linear progression, the method would allow the group to have better control over the progress of the project.
 - ***Less requirement for meeting schedule:*** While Agile and other iteration method require regular meeting within the team and the client, waterfall method allow the planning stage to be at the beginning of the project which also allows less requirement for meeting schedule. This would be more suitable for both the project team and the client of this project.

4.2 Data Collection

- As defined above, the final deliverables of this project should contribute to helping the client collect data about users' number of searches for each product categorized by gender and age. To capture all relevant data, the following approach is adopted in this project:
 - Firstly, a Signup/ Login function is developed so each user can log in the application and website using their Facebook account/ or users could sign up for a new account.

Hence, upon login using a Facebook account, users' birthdate and gender will be captured. Otherwise, in case that users choose to sign up for a new account, the system will request them to enter data related to their gender and age.

- Secondly, every time a user search for a product (or click on that specific product to check the detailed information), the application and website will record their search history and send it to the database.
- Finally, to collect users' behavior data, the client can access the database using the "collect and display data" function in the website to obtain the number of searches per product filtered by age and gender.

4.3 Data Analysis

- At this state, the client only requests the project team to develop a mobile application, a server, database and document a manual on how to administer the system. Furthermore, the project team has to ensure that the system will help the client collect users' behavior data upon implementing. This request may change in the next step.

4.4 Deployment

- During the deployment phase of this project, firstly, the project team will demonstrate how the mobile application, server, and database work to the client. After that, the source codes of both mobile application and server will be transferred to the client. Furthermore, to ensure that the client could implement and administer the system effortlessly, the project team will also conduct training on how to manage the system to the client and deliver the training manual to the client before the project ends. In specific, the training manual will consist of information about (1) Features of the system, (2) Description of each feature and (3) How to use those features.

4.5 Testing

- Software is now present in every aspect of our life and embedded in most devices that we use; It is difficult to find a device without a programmed software built inside these days. Hence, a single software written in one project could be installed by millions of users and help them either improve their living standards or just increase their work efficiency (Myers, Sandler & Badgett 2012). It is safe to say that technology impacts our daily routine and it is essential for developers to ensure the quality of a software.

- To deliver a reliable, usability and high-quality mobile application, it is essential to test the mobile application by implementing well-defined testing methods and tools. According to Gao et al. (2014), different testing methods will serve different purposes and help developers identify various issues with the application. Hence, due to the timeframe limitation of the project, the project team decided to implement the following testing activities: (1) Unit testing (2) functionality and behavior testing, (3) interoperability testing and (4) usability and internationalization testing.
 - **Unit testing:** Unit testing could detect isolated feature bugs or defects immediately by programmers who can modify the code and test a function in a repeatable process. Unit testing needs to implementation during the whole programming code. For example, regarding the search function, tester generates inputs to a module and examines whether the output is accurate. Tester requires to compare the results between reality and expected to ensure the quality of each module.
 - **Functionality and behavior testing:** Functionality and behavior testing method will help programmers identify whether the software operates according to the written requirements. Since it is essential to comply with the client's requirements when developing software, the project has decided to adopt this project to ensure that all features of the app are taken into consideration in the developing process.
 - **Interoperability testing:** It is expected that the app should target as many mobile devices as possible; For that reason, the interoperability testing method is adopted by the project team. This method enables programmers to test the compatibility of the software when it is installed in different devices. In specific, the mobile app will be installed into a virtual device and real-devices to test how it copes with these devices.
 - **Usability and internationalization testing:** The testing method requires the team to mimic users and walk through every function of the app. Otherwise, the client could join the testing process and test how the application work; Besides, the project team will collect feedback from the client during that time and improve the application accordingly.

5. RESOURCES

5.1 Hardware & Software

a. Mobile application

- The minimum version of Android SDK that this application supports is Android 4.1 – Jelly Bean since we want to ensure that the application could target most of our potential users. In specific, by supporting Android 4.1 version – Jelly Bean, the app is compatible with 99.6% of the devices (as of March 22, 2019) that run in the Android operating system.
- Furthermore, according to the project scope of work, the mobile application shall operate in Android operating system; For that reason, it will be developed in Java language and can be compiled using Android Studio (Provided by Google). Hence, the Integrated Development Environment (Android Studio) also provides Android Virtual Devices (AVD) function which allows programmers to launch and test the application on a virtual device.
- Facebook API: One of the external API which is employed for the application is Facebook API to comply with client's requirements. One of the client requirements is creating a Login button which allows users to access the services of this app using their Facebook account. The approach was agreed between the client and the project team as Facebook API not only helps users Login quickly but also lets the mobile app capture user's information (Gender and Age).

b. Server and database

- A Web application API will be developed as the server. In specific, the project team shall use JavaScript, NodeJS and ExpressJS as the programming language and libraries to develop the server; Hence, the mobile application will interact with the server by accessing Web URL and using Get, Post methods and query string. The server is expected to be able to run on any PC and server machine. NodeJS and JavaScript are adopted in this project due to their popularity in the programming community.
- Likewise, the project team uses MongoDB as a database of the system due to the compatibility between JSON data and mobile application.

c. Hardware

- A real-time server and database are necessary for the operation of the mobile application. In specific, having a server permits the administrator:
 - Control of data that the app will show to the users by adding, updating or deleting data in the database;
 - Collect users' behaviors of information by the client's purpose.
 - Enable users to report/ give feedback about stores which have a specific brand. The server will receive those reports directly and record them to the database; Furthermore, the data is then provided to all other users.
- Mobile devices which run in the Android operating system.

5.2 Materials

- The dataset of the animal-sourced brand collected by the client; The dataset should consist of the following data columns:
 - Brand categories;
 - Brand title;
 - Brand image;
 - Accreditation;
 - Rating (Avoid, Best, Good);
- Logo of the application developed by the client.
- Contents of multiple information activities in the mobile application (About Us, FAQs, Share, Glossary of terms, etc.) developed by the client.
- Furthermore, because this project aims to develop a mobile application, it is crucial that team members should possess or have access to computers with Android Studio application installed.
- Microsoft Office software which would enable team members to contribute their knowledge and effort in preparing a project proposal, progress report, and final report.

5.3 Roles & Responsibilities

Team member	ROLES	RESPONSIBILITIES
Jordan Ly	Team Leader <ul style="list-style-type: none"> - It is crucial having a team leader to allocate tasks, check up on members' progress and review their work products for the success of the project and the quality of the project team's final deliverables. 	<ul style="list-style-type: none"> - Check up on members' progress: To ensure that all members participate in the project and that their works should be finished on time, the team leader will check their deliverables every week. The adopted method for this task is the To-do list; In specific, all members must write down what they expect to do at the beginning of the week in the team To-do list. Hence, the team leader will use the listing to check the progress of the whole team every weekend. - Allocating works: After checking on members' committed tasks, the Leader will advise all team members in case there are other tasks needed further attention, so they can focus on doing the right jobs and postpone the unimportant tasks. - Review members' work products: To improve the quality of works delivered by all team members. Furthermore, it also helps ensure that the final deliverables comply with the scope of work and requirements defined by the client.
	Developer <ul style="list-style-type: none"> - Having expertise in mobile computing and web app development, Jordan will also act as a developer throughout the project period. In specific, he will conduct hands-on development on some of the important features of the mobile application and the server. 	<ul style="list-style-type: none"> - Developing these following functions for the mobile application: <ul style="list-style-type: none"> ▪ Search function and search UI for the application; ▪ Browse function; ▪ The local database which consists of the (1) Brand (Title and Image), (2) Accreditation (Rating, organizations and relevant Brand), (3) Users' behaviors; ▪ Find stores and report functions; - Developing the server and database for the system to ensure that the mobile application could connect to the server to retrieve and push relevant data.
	Business Analyst <ul style="list-style-type: none"> - It is crucial that the requirements of the final 	<ul style="list-style-type: none"> - Drafting the project proposal. - Liaising with the client to analyze and verify the requirements of the system. Ensuring that the

	deliverables are correct and feasible. The Business Analyst will communicate directly with the client to gather and document the client's expectations and requirements.	<p>requirements are completed, consistent, unambiguous and feasible for the project team;</p> <ul style="list-style-type: none"> - Documenting the requirements of the mobile application and server;
Wolfe Lee	Developer	<ul style="list-style-type: none"> - Coding on the server side in this project, including set up the database on the server and connect it to Android application so the application can retrieve data from the server to display the information. - Coding the part of registration and login. - Managing the source code on GitHub to make sure the works from each member are working together and not conflict. - managing the wiki on GitHub to record the works which other members have done every week and ensure everything is in progress.
Stacey	Developer	<ul style="list-style-type: none"> - Developing the followings functions of the mobile application: <ul style="list-style-type: none"> ▪ Home page; ▪ Search and Search Results pages; ▪ Browse and Browse Results pages; ▪ Detail Information page; - Designing the UI prototype to ensure that the Android application is user-friendly. - Conducting training to the client - Implementing the unit testing to detect potential bugs in the individual module. - Implementing functionality and behavior testing to ensure that functions meet the requirements. - Implementing interoperability testing and usability and internationalization testing to deliver a reliable and usability application.
Penny	Developer	<ul style="list-style-type: none"> - Developing and Coding the followings functions of the mobile application:

		<ul style="list-style-type: none"> ▪ Our Rating Page; ▪ Locate / Report Function; ▪ More Page - Designing the following functions for UI Prototype of the mobile application: <ul style="list-style-type: none"> ▪ Browse Function, based on the initial Prototype. ▪ Rating Function, Login/Register. - Coding and improving the actual User Interface of the mobile application to ensure that it is user-friendly, including: <ul style="list-style-type: none"> ▪ More Page, including User Profile, Other Functions (Rating and Report) and More Information regarding this project. ▪ Our Rating Function ▪ Locate/Report Function - Documenting the manual and UI tests for the system to identify malfunctions. - Troubleshoot and debug to optimize performance.
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6. EXPECTED OUTCOMES

6.1 Project Deliverables

- Product-related deliverables:
 - Source code in Java for the Kinder Food Finder mobile application;
 - Source code in Javascript for the server and the MongoDB database to manage Brand data and Users' behaviors;
 - Instruction manual on how to operate the mobile application and server;
 - Documentation of the system.

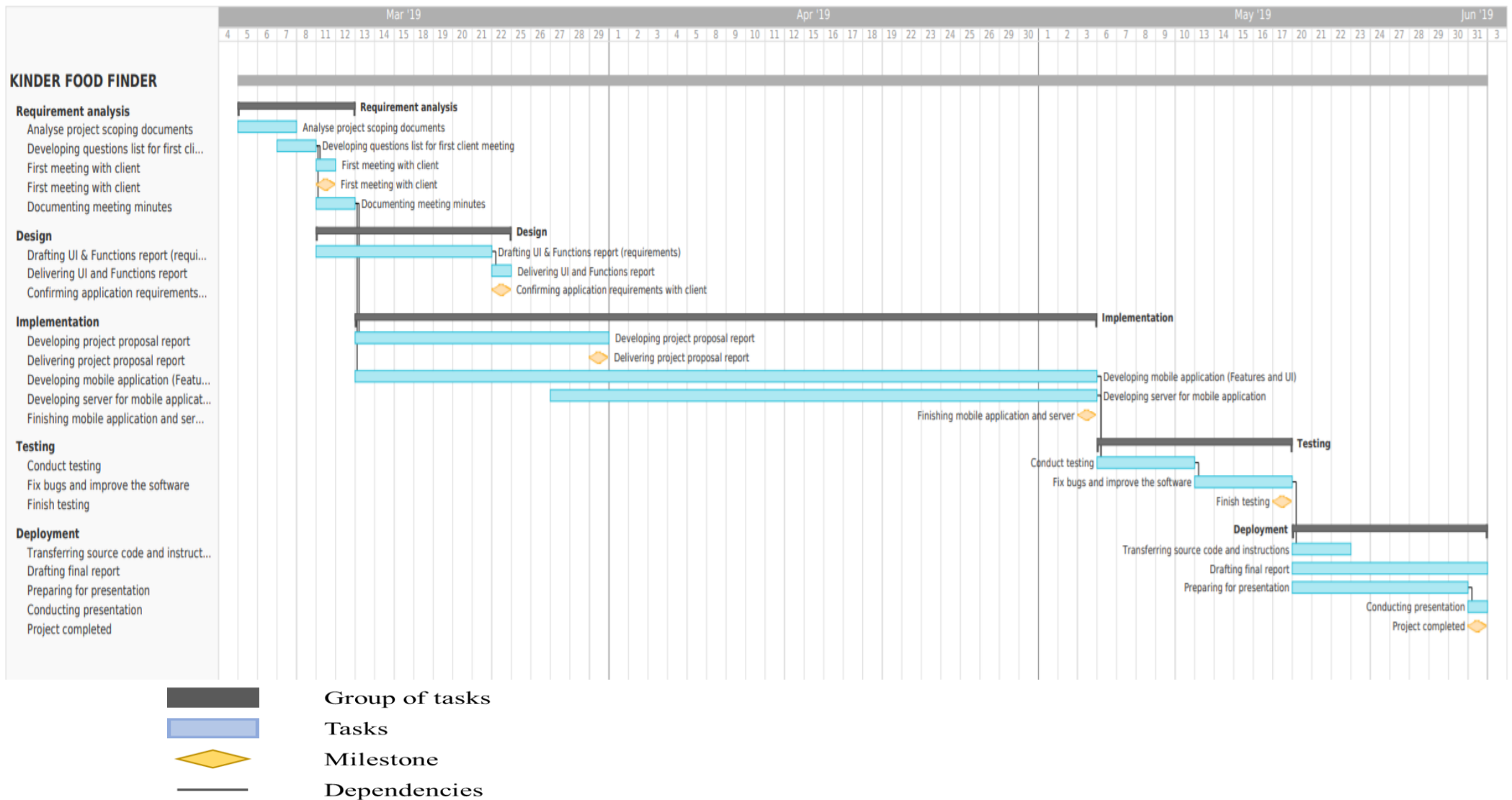
6.2 Implications

- The output of this project is expected to enable our client to collect users' behaviors data and use that information in researching the connection between animal welfare,

consumers' demographics, and shopping preferences. In specific, by the end of this project, the client shall implement the system (Including the application, server, and database) and enable real users to access the services provided by the system. Hence, when users interact with the mobile app and search for animal welfare rating of a brand, their behavior will be recorded by the application and sent to the server. The server will record those data in the database, and the client can access those data to enrich the research.

- Furthermore, the deliverables of this project also contribute in improving transparency regarding the living conditions of animals and help provide more information about their living situation to consumers; By granting access to this information, we expect that shoppers will make better choices for animal welfare when they go to the stores.

7. MILESTONES/ SCHEDULE



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