Department of Computer Science

Vincent Mary School of Science and Technology

CS 4200 Senior Project 2

Flying Basket: A Mobile App for Indian Food – Grocery Online Shopping

Project Advisor:

Asst. Prof. Dr. Anilkumar Kothalil Gopalkrishnan

Project Committee:

Asst. Prof. Dr. Rachsuda Setthawong

Asst. Prof. Dr. Dobri Atanassov Batovski

Submitted By:

5815227 Kevin Narang

18th December 2019

Flying Basket: A Mobile App for Indian Food – Grocery Online Shopping

Department of Computer Science

Vincent Mary School of Science and Technology

CS 4200 Senior Project 2

Project title:	Mobile Application for Online Grocery Shopping
By:	Kevin Narang 5815227
Project Advisor:	Asst. Prof. Dr. Anilkumar Kothalil Gopalakrishnan
Academic Year:	2019

The Senior Project committees of the Department of Computer Science, Vincent Mary School of Science and Technology, Assumption University had approved this Senior Project. The Senior Project II is submitted in partial fulfillment of the requirements for the degree if Bachelor of Science in Computer Science.

Approval Committees:

(Asst. Prof. Dr. Anilkumar Kothalil Gopalakrishnan)

Project Advisor

(Asst. Prof. Dr. Rachsuda Setthawong)

Committee Member

(Asst. Prof. Dr. Dobri Atanassov Batovski)

Committee Member

Acknowledgement

I would firstly like to thank Asst. Prof. Dr. Anilkumar Kothalil Gopalkrishnan for the advice and his input throughout this project. Without the weekly meetings and the support this project would not have been completed or be at the stage where it's at now. I am also very thankful to the two committee members Asst. Prof. Dr. Dobri Atanassov Batovski and Asst. Prof. Dr. Rachsuda Setthawong for accepting my invitation to becoming the committee members for this project. Their input has been nothing but productive and constructive with regards to the project. I would also like to thank my friends and the various stakeholders that are involved in this project and specially the Indian community in Bangkok who came in with the clutch in filling out the survey. Lastly, my gratitude goes towards Assumption University of Thailand for providing me their platform to gain the knowledge that I have used in this project. The result is of the skills I have attained from the years spent in this institution.

Abstract

This project focuses on ordering Indian cooked food and Indian grocery items online. Currently it is a mobile application for android users that is fully responsive. The restaurant / grocery store owners can add items that can be listed for sale for the customers that are the users of the application. On the same hand the application is a user friendly and easy to use system where the user can add the items to their carts and simply place order via the mobile application. Every data is stored on the cloud. This application is the only application in Bangkok that focuses on the online service of delivering Indian food and grocery items. It reduces the hassle of the people who go to shop for these products. This application will allow you to sit at your home and order the products and they will be delivered to your doorstep fresh. We are anticipating that this application would be useful to the Indian community in Bangkok.

Table of Content

List of Figures

Introduction

We live in a society that is connected to the internet at all times. In this day and age people are relying on their smartphones to do their tasks or at least the basic tasks. With the help of smartphones and internet developers around the world have created applications that can come to decent use of the daily average users. Online food shopping is one of the major applications that people come across the play store or the app store. Let's come back to Bangkok. There are applications like 'Food Panda' , 'Grab', 'Get', etc. that are used commonly to order food online. 'Happy Fresh' on the other hand is the only application that delivers and allows users to shop for groceries in Thailand. But they only handle the big vendors such as Tesco, 7-Eleven, Tops, etc.

Flying Basket is an online Indian food / grocery shopping application. The main reason for this application to even exist is that there is an estimate of 150,000 to 200,000 Indians that reside in Thailand. A simple Google search got me that statistic. Since there are no systems that exists for an Indian food / grocery shopping online, Flying Basket would be the first one to do so.

Initial Survey

In order to start the development of the application, it was important that I held a survey so that I can get different perspectives of people on what they think about the existing online food/grocery delivering and ordering system. Hence, I created a simple generic survey that was shared with my friends and family for them to fill up. We manage to get 55 responses and all 55 of them are Indians that reside in Thailand.

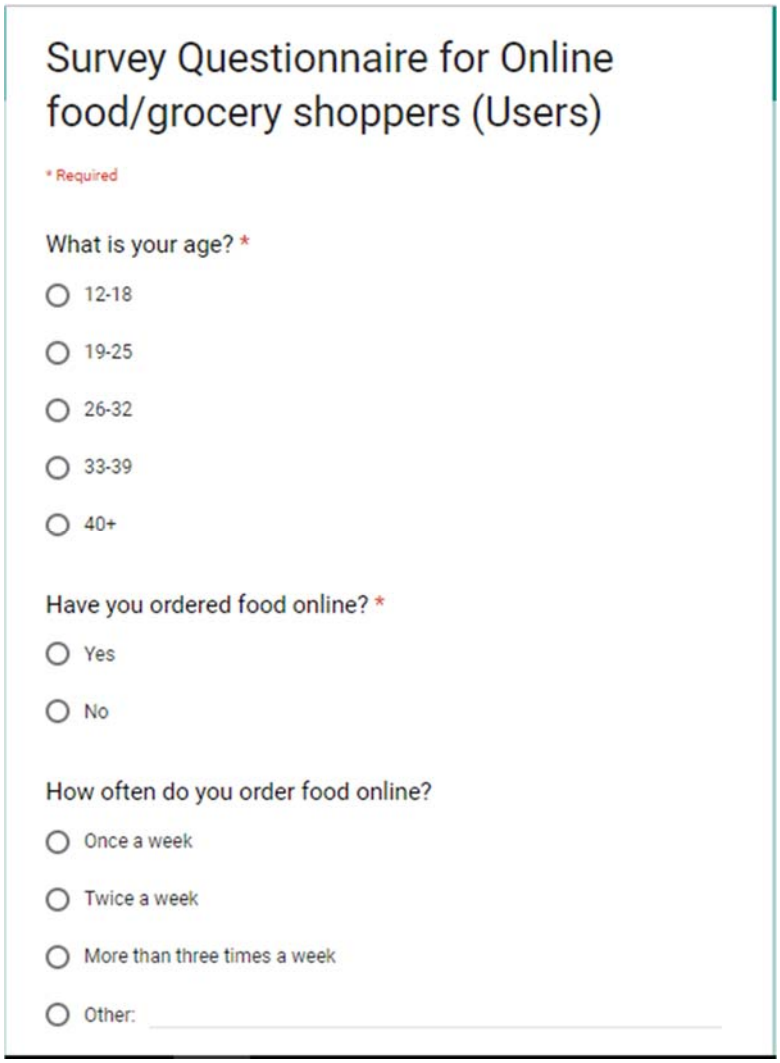


Figure 1: Survey for the customers

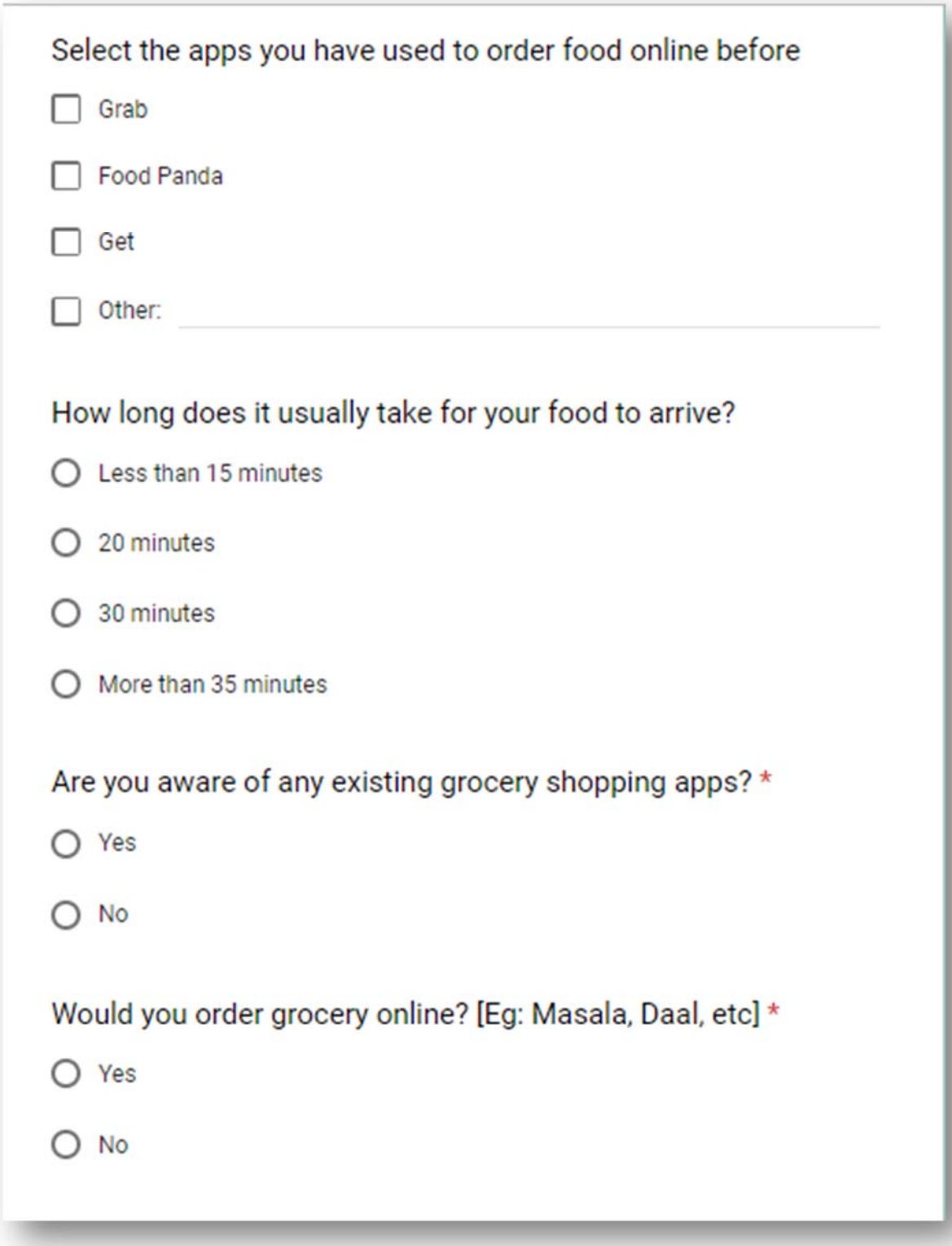


Figure 1: Survey for the customers

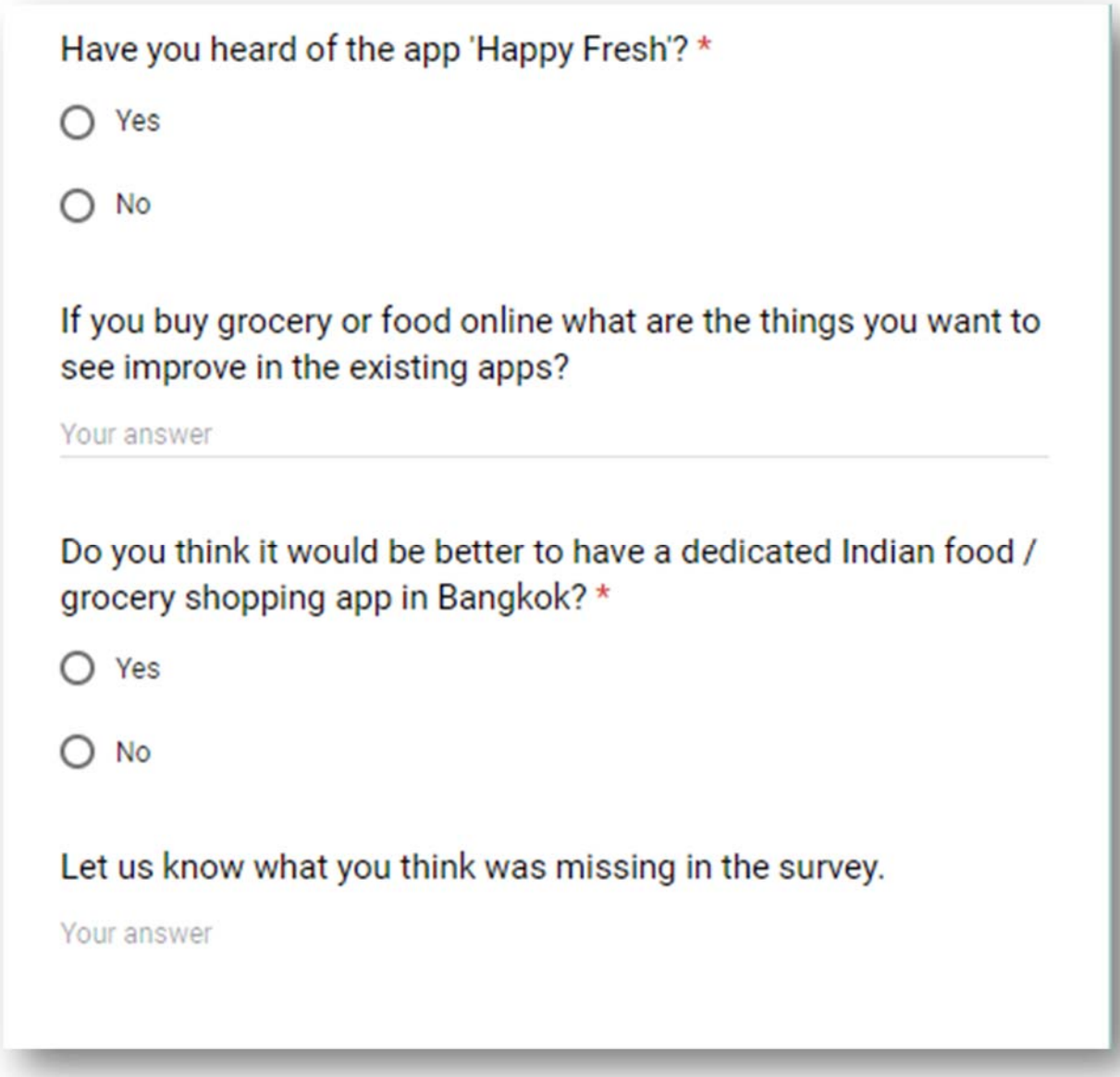


Figure 1: Survey for the customers

Results from the 55 responses in form of pie chart from the conducted survey for customers:

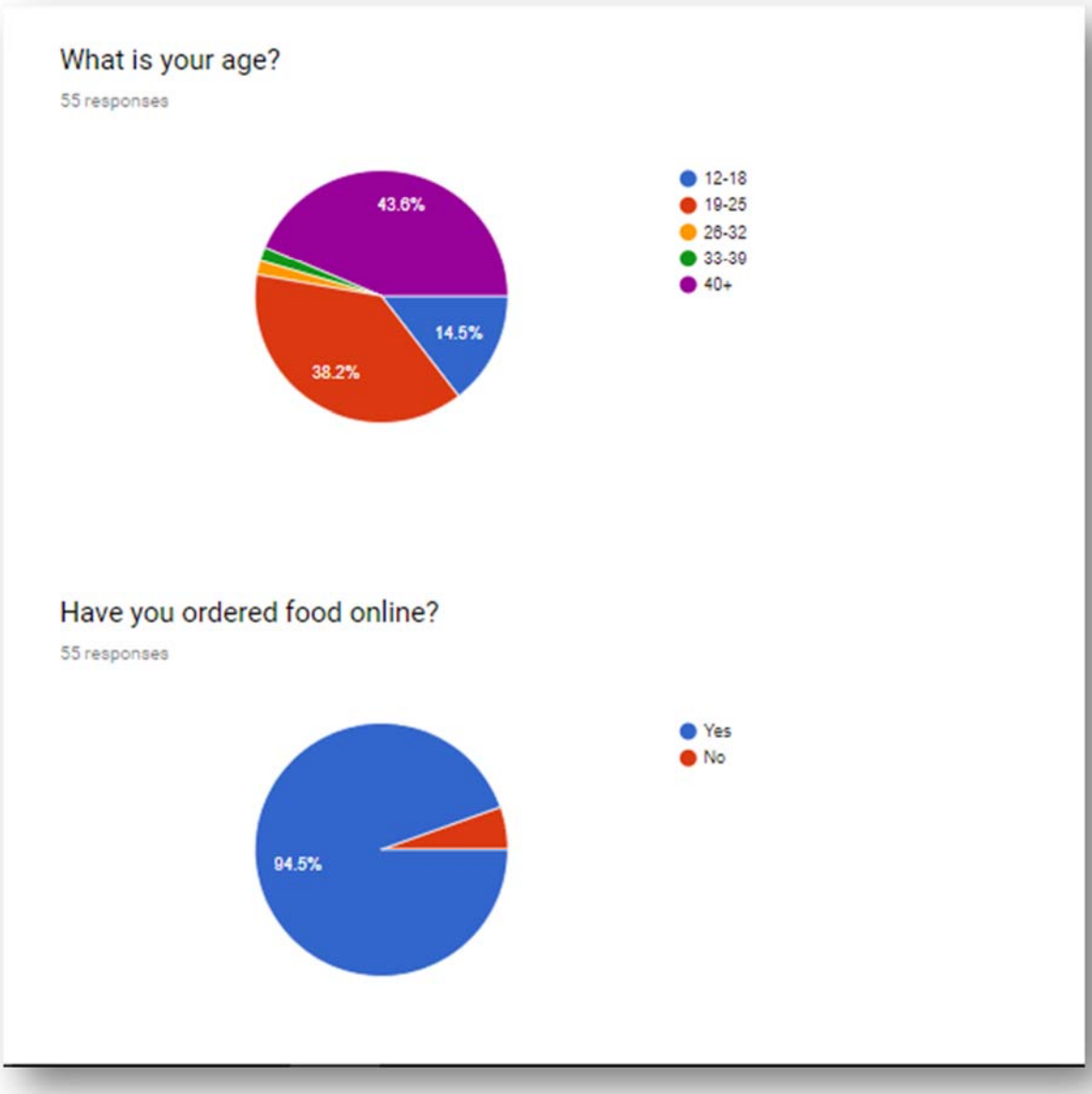


Figure 2: Response from the potential users

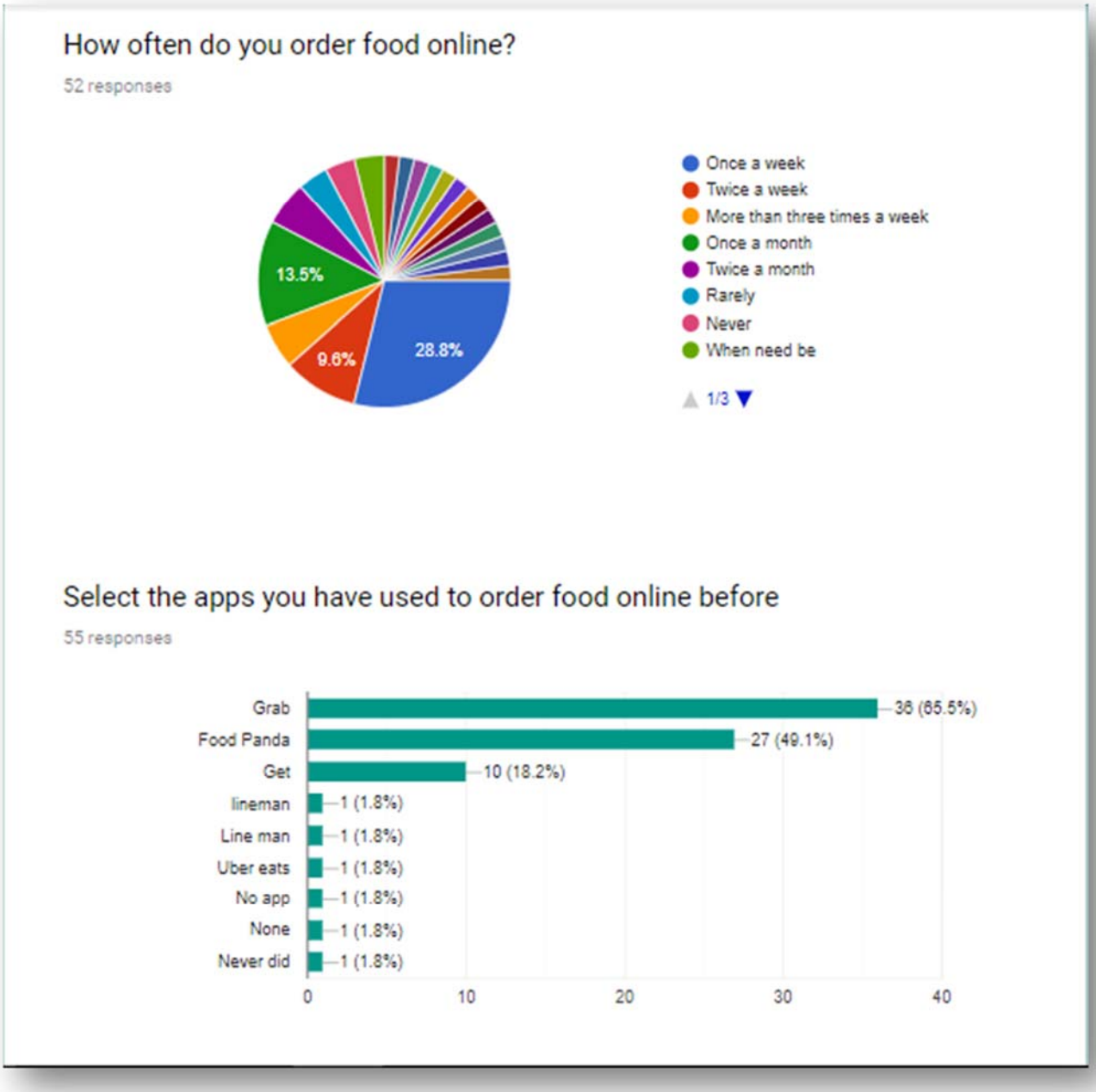


Figure 2: Response from the potential users

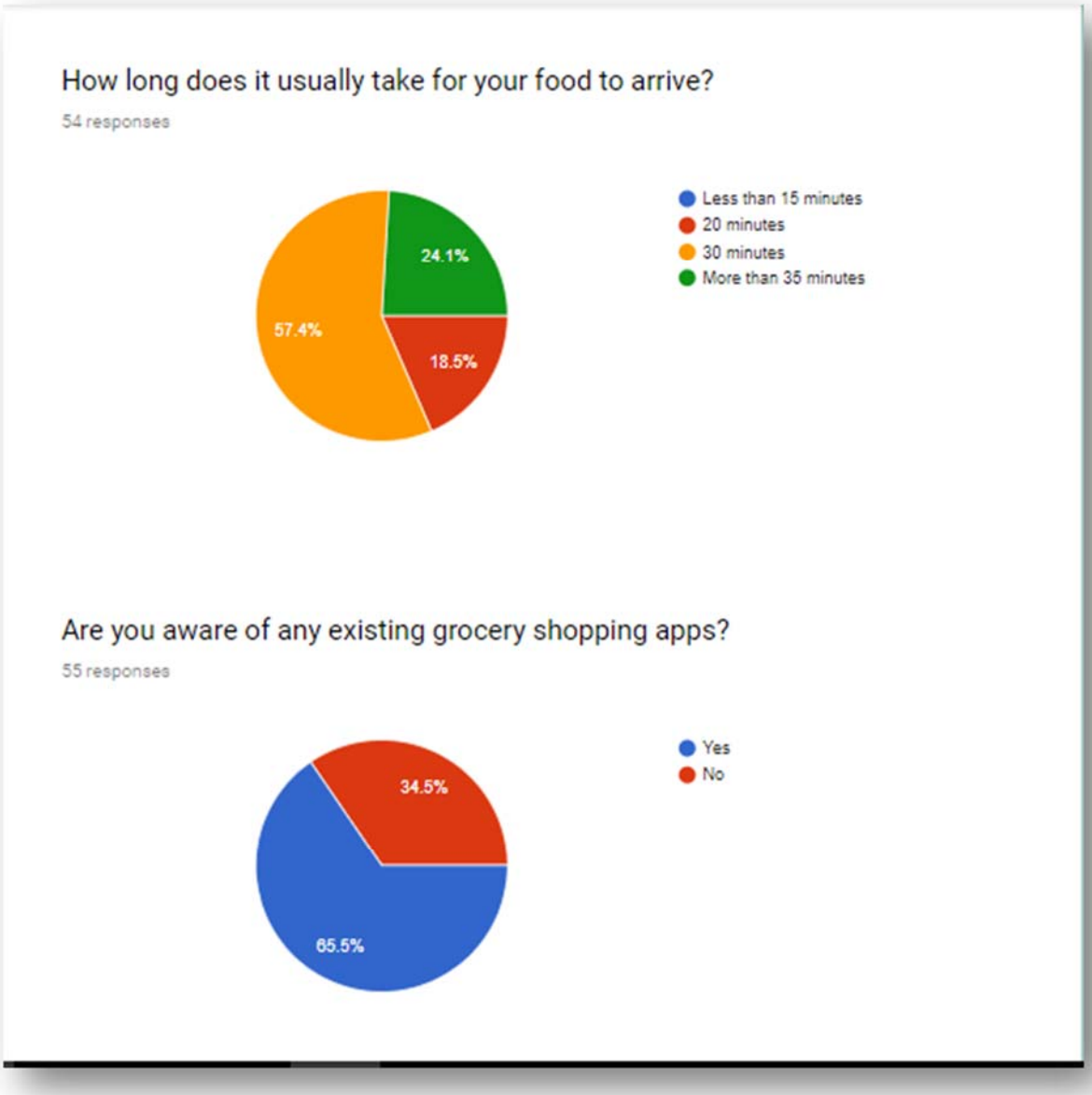


Figure 2: Response from the potential users

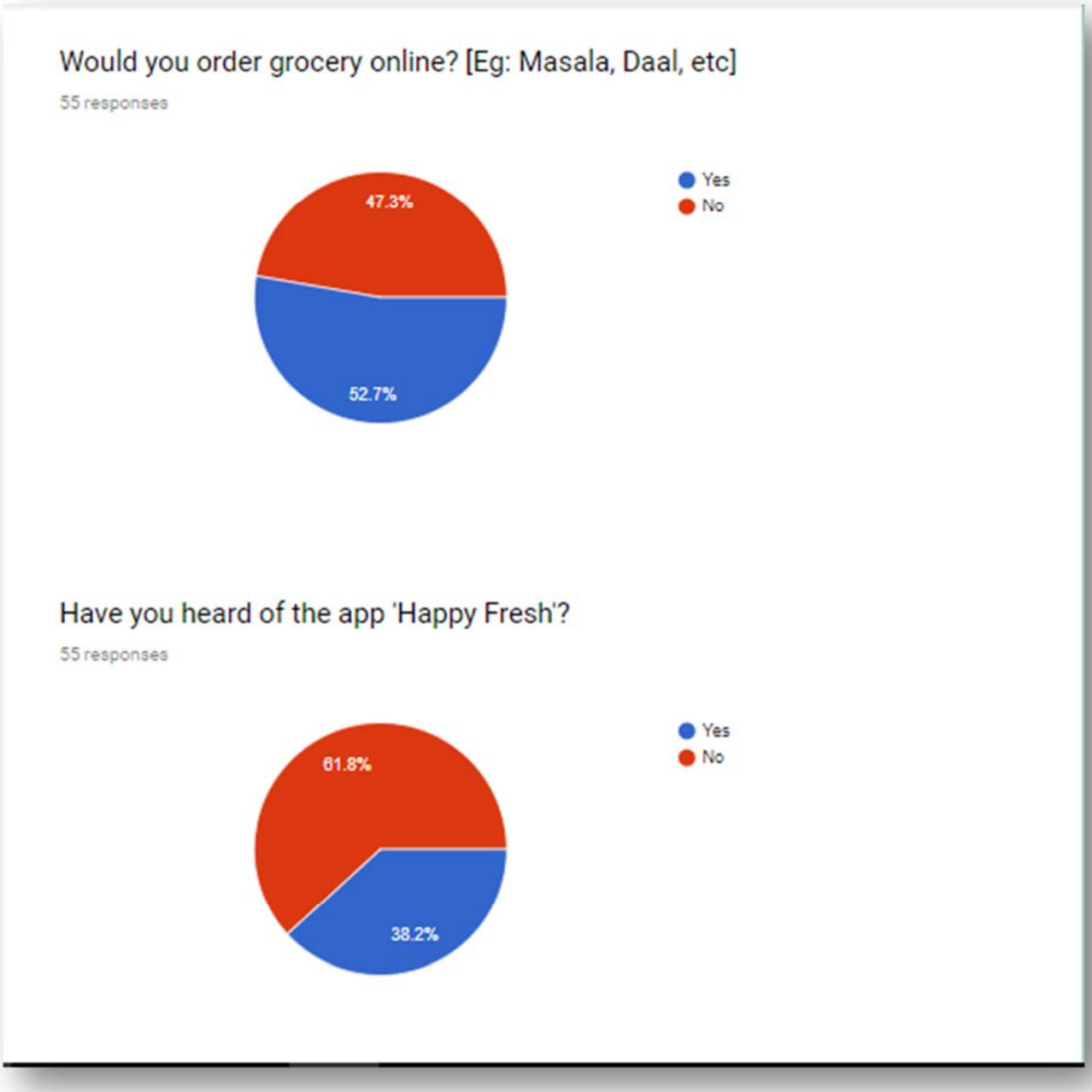


Figure 2: Response from the potential users

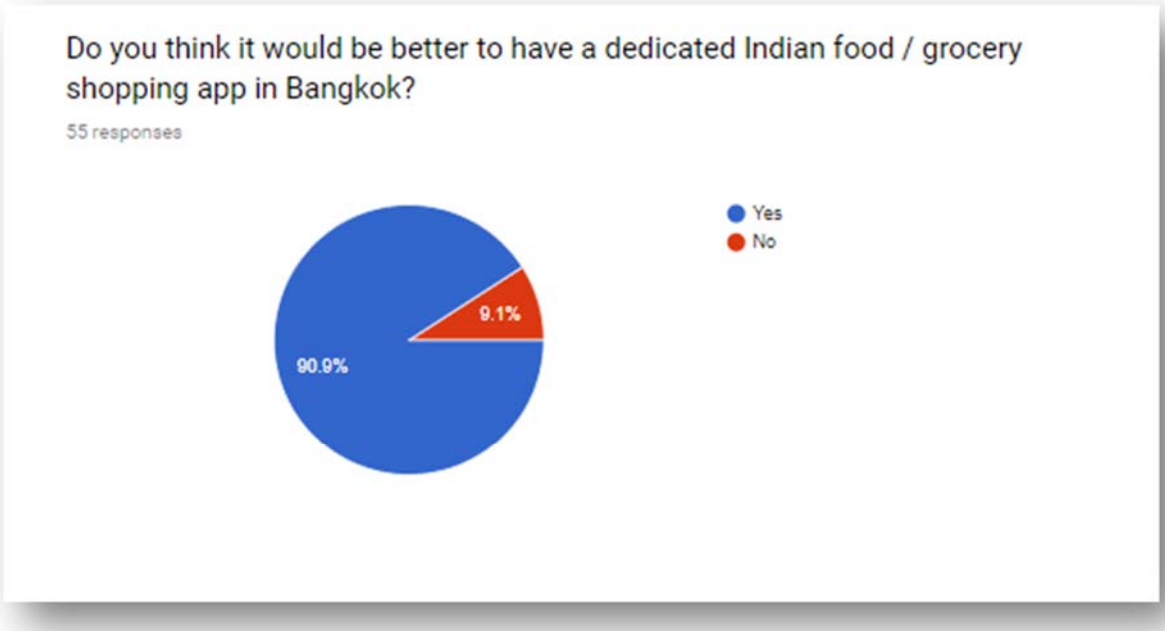


Figure 2: Response from the potential users

Statement of the Problems

As per the initial survey conducted to the potential customers / users, there is a section in which I asked the customers for their feedback on the existing applications that does the similar functions to that of my application. Out of 55 responses to that question I have summarized the list of problems as follows:

1) **Very hard to find Indian grocery items online**
   It is very evident that people do want to see an application that provides Indian food / grocery items according to the survey that was conducted but in the applications that do exist that sells grocery items like 'Happy Fresh' do not provide Indian grocery items. For Indians that reside in Bangkok, whenever they need some Indian spices to cook at home they always have to venture out or go to their favorite grocery shop to buy the products.

2) **No proper Indian food ordering system**
   Majority of the Indians that reside in Thailand live in Bangkok near Thapra area. We do have many Indian restaurants around Phaurat and Sukhumvit but when it comes to ordering online these stores are not available for the people. Food Panda is another application that allows its users to order food online. They use geo fence method to cater to their audience and because of that Indian restaurants get cut out from the area.

3) **Existing applications target only supermarkets like Tesco, 7-Eleven, etc.**
   When it comes to online grocery shopping in Bangkok, there is one application that provides the service. That application is 'Happy Fresh'. The main problem with that application is that they cater to only the big players in the market which makes business sense to them. They have partnered with big companies like Tesco, 7-Eleven, Big C, Tops, etc. The companies that are mentioned do not sell Indian grocery items and hence the Indians in Bangkok are left with no other options but to go out on their own to purchase these items which kills the entire purpose of having an online grocery shopping application.

4) **Not enough variety of Indian food in existing applications**
   Similar to the first statement of problems, this problem focuses on Indian food instead of Indian groceries. In the existing applications that allows you to order food online, they do not have enough variety of Indian food or in that regard Indian restaurants. Being a minor of the society Indians still populate around 200,000 in Thailand and having even a fraction of that number as your potential customer could be crucial. They

are also connected with smartphones and wish to enjoy the luxury of having food delivered to them. In existing systems it is hard to find Indian food to shop online for.

User's Functional Requirements

Flying Basket is a mobile application that brings in many benefits to the Indian community in Thailand. The following are the outline of all the requirements that will satisfy the stakeholders and the users of the application.

The users that are involved in the using of the system are as follows:

A. Customers
B. Restaurants / Shop owners
C. Administrator(s)

In many cases the administrator has bare minimum of a role to play. Flying Basket in its early stages will demand an active administrator to monitor the behavior of other users.

Customer's functional Requirements

In our case the customers in this section is not the clients but the users who will use Flying Basket as an asset to order their food / grocery online.

1) **View the various listed items**
   The customers will be able to view the approved products that has been listed by the various shopkeepers / restaurant owners once they have successfully logged into their registered account.

2) **Search for the desired item**
   While in the home fragment, the customer can use the navigation drawer to view the various menu features and search is one of them. The customers will be able to search the products by its name.

3) **Update / Change their personal information**
   The customer will have the ability to add a profile picture, a delivery address, and the ability to change their name and phone numbers that they have used to register into the system.

4) **Add various items to cart**
   The customer will pick their desired items with the quantity of the item and be able to add the items to cart.

5) **Able to Edit/Delete from cart**
   Once the customer has added items to the cart, he/she will be able to revise the cart by going to the cart activity. If they find the need to increase or decrease the quantity of their chosen products they can do so. However '10' is the maximum amount you can place as an order. If the customer changes his/her mind about the selected items, he/she can delete the item(s) from the cart.

6) **Checkout with their details**
   The customer will have to fill out their delivery details once they have finalized the items they have placed into the cart. The details will include the name, address, and phone number of the customer.

7) **View status of current order**
   The customer is restricted to one order at a time. Once the customer has placed his/her final order, the cart is on lock which means he/she is unable to add products to the cart till the admin verifies the purchase. This is to prevent spams. There will be a status message in the cart activity for the user who has placed an order but has not been processed by the admin.

Restaurant / Shop owners Functional Requirements

The main task of these users are to place a listing of their products that they plan on selling to the customers.

1) **Requirement of a Registration**
   The restaurant/shop owners are more of a client to Flying Basket than a regular user. They fill in an important role for the application's process. Hence, they require a more detailed registration form than that of the customer's which includes email and password of the restaurant/shop owners. But they need not worry because we are using Google's Firebase authentication to keep their passwords encrypted which means even the admin would not know what the password is.

2) **View the listed products (approved and non-approved)**
   The restaurant/shop owners will be able to view the products they have listed. All the products which includes the approved as well as non-approved products.

3) **Add new products for listing**
   This is an important feature to the restaurant/shop owners which is to add the listing of their food/grocery products. They will add the name, price, description, and the image of the product under this function.

Administrator Functional Requirements

Unlike many other systems or applications, Flying Basket at this stage requires an active administrator hence, the functional requirements are demanding.

1) **Approve new listings**
   The administrator's main job would be to approve the listings of the various products that have been listed by the restaurant/shop owners. This is a necessary function because it allows the admin to monitor the type of products that are being listed to the application. It prevents malicious activities.

2) **Check customer orders**
   The administrator's will be able to view the final orders of the customers with the details like phone number and address as well as the details of the order. The administrator's task in this case would be to approve if the product has been processed or not.

3) **Maintain listed products**
   The administrator will be able to maintain the listed products. This functions allows the administrator to edit the name, price, description of the product. The administrator also has the right to delete the product permanently from the system if he/she wishes to.

Objectives

The main objective of this project is to design and develop an online food and grocery shopping mobile application called "Flying Basket". It is a responsive android mobile application. The following are the objectives of this project:

1) **To bring an online food and grocery shopping system for the Indian community in Thailand**
   Since the plot of this project, we always had in mind to do something that is out of the box and unique. Having being in 2019 and people connected to the internet with their smart phones, and having applications that do not cater towards Indians in Thailand, we came up with this objective of having an application of our own (Flying Basket) that would not only sell Indian cooked food but also Indian grocery items.

2) **To bring easy access to the Indian ingredients to your home**
   With Flying Basket we can bring a much easier way to have Indian ingredients delivered to your homes. Since no application like Flying Basket exists, we can help Indians living in Thailand to enjoy the similar luxury that of to a user of 'Happy Fresh'

3) **To save valuable time and bring productivity**
   Flying Basket will bring in productivity and will save our user's valuable time. The customers will be able to order food online through Flying Basket and not go out to physically purchase food (Indian in this case). If the customer is working in an office this could bring in more productivity in work as well as save time.

Scope of the Project

There are THREE stakeholders involved in this project:

1) Customers
2) Restaurant / Grocery Shop Owners
3) Administrator

User Registration and Login

There is a common function for every user (stakeholders) that is required to access the application and its features. The main thing the user must do before accessing the application is to go through Registration process. All 3 stakeholders have different registration forms. The customers will have to register with their phone number and the shop/restaurant owners will need to register using their email as well as phone number. The password is being save with encryption that is provided by Google's authentication system for emails and passwords. Whereas for the administrator the registration is more of a manual process of having entries done in the database directly.

For logging into the system you need to go through the registration process. Once that is complete the customers will require their phone number and password that they used for registration to login. It is the same for administrator as well. For our restaurant/shop owners they need to use their email and password that they used for registration to login to the system.

Customer:

1) **Place an order**
   After login to the application the customer will be taken to 'Home Activity" where the customer can view the various variety of products listed by the shop owners. The customer can further view the details of the product and place an order from the details page.

2) **Search for products**
   If the customer cannot see his/her desired product, he/she can search for the product under our search section of the application which can be found in the navigation drawer. The search is filtered by product name.

3) **View cart for current order**
   Once the customer has placed an order, he/she can view their current order in the 'Cart Activity'.

4) **Confirmation and modification of current order**
   While the customer is at the 'Cart Activity', he/she can modify the current order that they have added to the cart. They will be able to change the quantity of the item they have chosen and also if they have a change in mind they can remove the product from the cart permanently itself. Once the customer is satisfied with what he/she wants to place an order for, they can place the order by simply filling in the details of their delivery.

5) **View order status**
   Now that the customer has successfully placed an order it has gone under process for verification by the administrator. While the order is being processed, the customer can view their status of the order by simply going to the cart. Flying Basket allows its customers to place one order at a time. This technique is also used by 'Food Panda' to avoid spams.

6) **Edit personal information**
   Apart from the main processes, the customer has the freedom of editing or updating their current personal; information. In the settings menu in the navigation drawer the customer can edit their phone number, address, add a profile picture, and set up security questions if in case they forget their passwords.

Restaurant/Shop Owners:

1) **Add a listing for their products**
   After login, the restaurant/shop owners will be taken to the activity where they can view their listed products. This activity has a bottom navigation menu for adding products and logout.

2) **View the listing of their products**
   If the restaurant/shop owner wish to add a new product they can simply go on the bottom navigation and tap on the 'Add' menu. After that they choose the category of

the product that they wish to add. They have to select a picture and fill in the details. Adding a product does not mean that the customer can purchase the product instantly. It needs to go through verification and approval process which is done by the admin of the application.

3) **View the status of their listed products**
   Once the restaurant/shop owners have added their product they can view the status of their product. The information is found below every product that they have listed. This status exists to let the restaurant/shop owners know of their listing has been approved by the admin or not.

Administrator:

1) **Maintain products**
   After successfully logging into the account, the admin will be taken to the 'Admin Home Activity' where maintain products is a feature. This feature allows the admin to edit the name, price, and description of the approved products. The admin also has the complete power to delete the product permanently from the application.

2) **Check new orders**
   This is another feature that the admin has access to. Under this the admin can check if any new orders has been placed by the customers. The orders are displayed in cards with name, phone, address, and amount. The admin can click on the details to view the specific quantity of the products ordered. After the admin has done processing the order, the admin can remove the order by just approving the processing stage. This will open the access that allows that specific customer to add items in cart.

3) **Approve listing of products**
   Every restaurant/shop owner must provide a listing of their products that can go for sale to the customers. But that needs to go through approval process. The admin has this feature where he can view the listing of new products by the restaurant/shop owners which have not been approved. After viewing these products the admin can then make a decision if he wants to approve the specific product for sale or not.

Limitations

1. The restaurant/shop owners cannot edit or update their information once they have registered. If they wish to do that they need to contact the admin.
2. The search feature is limited to search by 'product name' and it is case sensitive. Firebase has a calling function startBy() which needs exact String elements.
3. The system is not fully automated as of 18th December'19 which means administrator input is needed more than usual.
4. There is no way to know if the customer has received the product or not. This comes with having your own logistics system and that is something we are looking to have in the future.

Cost and Benefit Analysis

1. **Software and Tools**
   For the backend of the application Java is being used as the main language. One of the main reasons of going with Java was because of the clear MVC style of programming was possible with it. Being an object oriented language it helped with certain stages where the application had to communicate between the model and view. Other things like Gradle dependencies have also been used. To make our database connection possible with the application we had to add a dependency for Firebase in the module of the application. Other than the backend we have also used xml for the designing of our UI. Xml is fluent when it comes to communicating the view with the controller which is written in Java. There are certain tools that have been used in the building of the application. Those tools include:
   a. Android Studio
   b. Firebase by Google


2. **Dependencies**
   We used some dependencies for the UI of the application. Those include:
   a. Rey5137 Material Design for the checkboxes
   b. Hclodenhof Circle Image View for making the profile picture round
   c. ArthurHub Android-Image-Cropper for cropping the image while selecting one
   d. Android-Arsenal for the quantity button

3. **Benefit Analysis**

   Flying Basket is an online food/grocery shopping mobile application for android that brings in benefits mainly for people that look for Indian food and ingredient to buy online in Thailand. This application makes it easy for people to find the correct ingredients and food from trusted and established restaurants and grocery shops. It solves the problem of people having difficulties in finding Indian food and Indian grocery items. Everything is now available in one platform which makes it better for the experience of the user.

System Analysis and Design

1. **Project Identification and Selection**

   The project initially came in the form of an idea from thinking outside the box. I was under the impression of making this as a start-up and was thinking what would be something that has not been done yet at least in Thailand. Then the idea of grocery shopping came up. A quick Google search let me know that about 200k Indians reside in Thailand. That's how the idea of making an application that can cater to Indians that live in Thailand came about. Hence, Flying Basket is the result of that idea.

2. **Project Initiation and Planning**

   Now that I have the idea of what to make, I had to go and collect information that can help me with the initiation of the project. I went and did a research on the existing applications that sells food or groceries online in Thailand. Doing this gave me a clearer picture of the processes that those application go through from a user point of view. After doing that I had to ask the Indian people a few questions that I came up in the survey. We had 55 constructive responses which were kept in mind while making of Flying Basket.

Figure 3: Gantt chart

3. **Analyzing system needs**
   After analyzing the system needs which mainly came from the data of responses collected from the survey I designed a Data Flow Diagram (DFD) and an explanation of how my Real-time Database is structured.

4. **Designing the proposed system**
   After the designing of DFD I went back to my pen and pad to have a rough drawing of how the application would look like. Using the data flow I came up with a prototype for the application which gave a clear idea of how the application would look like.

5. **Development of the proposed system**
   The development phase had to start early. This phase was the place where I came with many changes. With more time spent in coding, more ideas and correction came in place. Even the final designing of the application was done in this phase. This included programming in Java and integrating the application with a real time database which stores the data in cloud.

6. **Testing the system**
   After every process that was required was working I went further to test with potential customers for the application. I had 4 people test the application from the customer point of view and after that they were required to fill the satisfaction survey.

Questions	Opinions				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
The information was clear and sufficiently provided in the system.					
I could use the application to search for products.					
I could use the application to edit my personal information					
I could use the application to add products to the cart.					
I could edit / delete products from the cart.					
I could successfully checkout from the cart.					
I could view my order status.					
The system had provided with basic processes for an online food / grocery ordering system.					
Overall I am satisfied with the system usage.					
Let us know anything that you want to add.					

Evaluation Survey for User Satisfaction on Flying Basket (Customer).

Questions	Opinions				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
The app was easy to use.					
The screen layout is clear and simple.					
It was easy to find the information what I needed.					
It was easy to find the functions that I needed.					
It was easy to complete tasks.					
It was easy to recover when there were mistakes.					
The system was complex.					
Overall I am satisfied with the system Ui/Ux.					
Feedback					

Evaluation Survey for User Satisfaction on Flying Basket Ux/Ui (Customer).

The pie chart shows the responses that we evaluated from the satisfaction surveys (Customers):

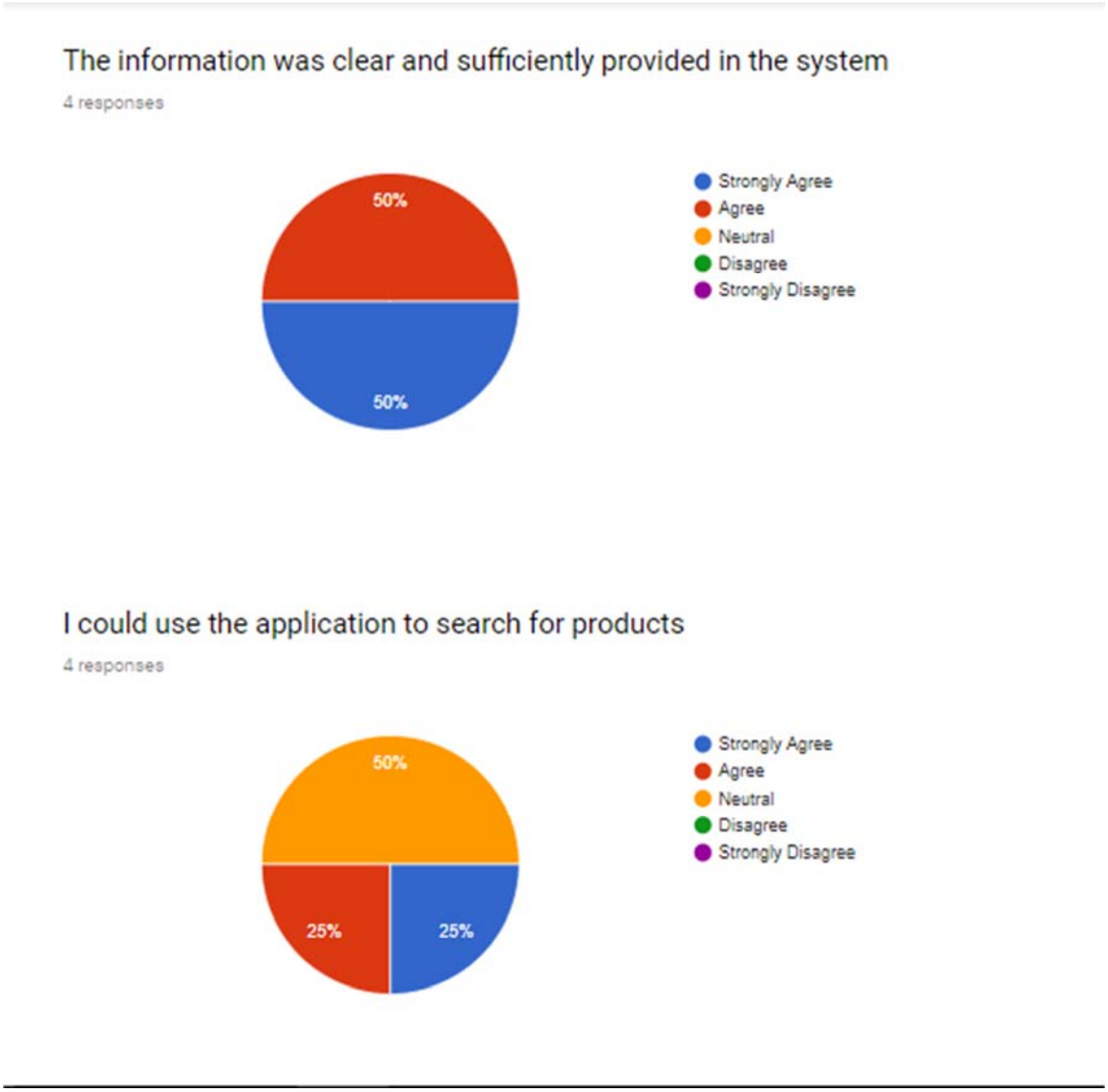


Figure 4: Satisfaction Survey Response

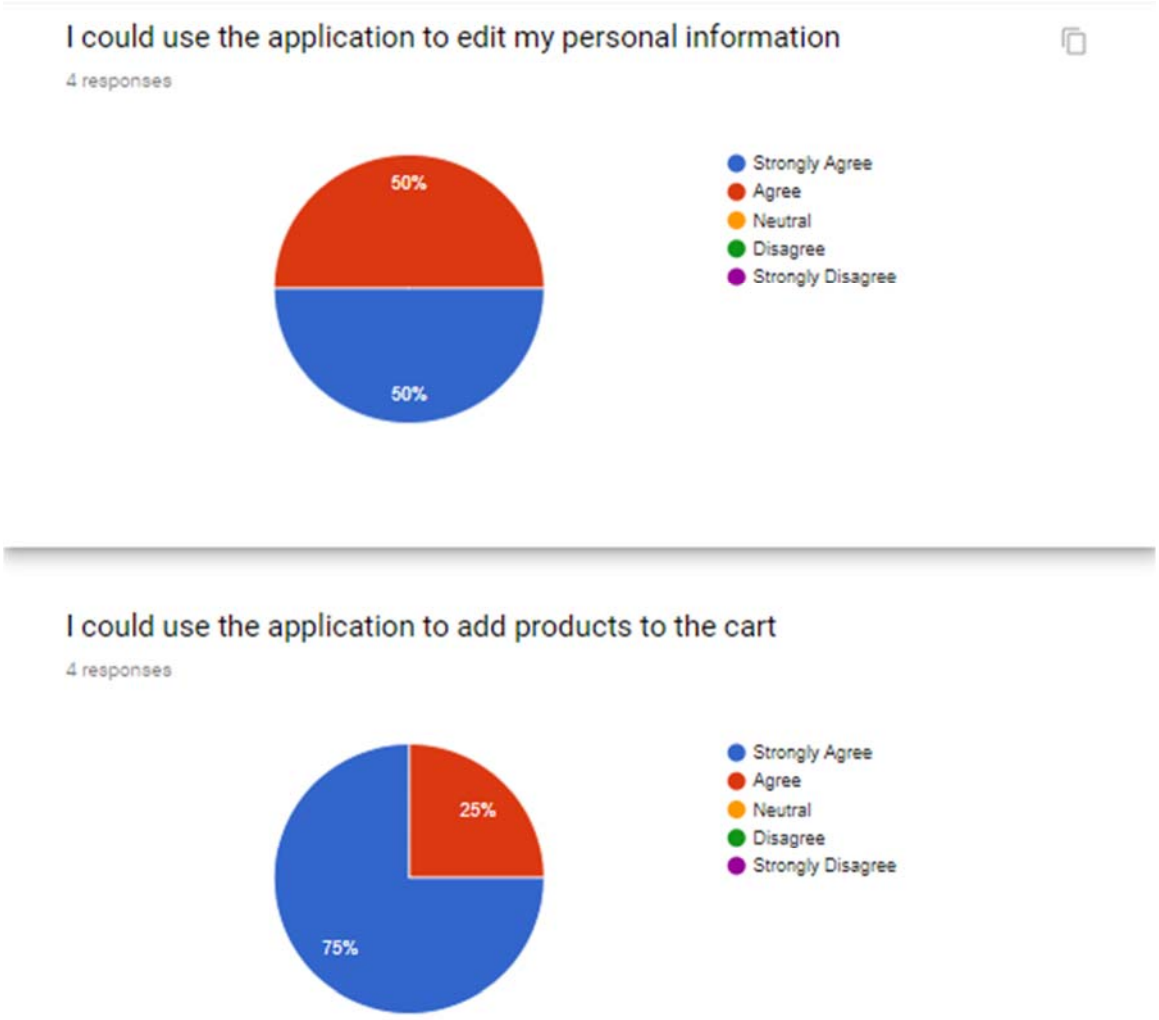
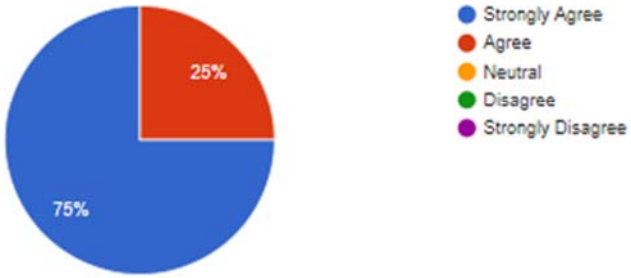


Figure 4: Satisfaction Survey Response

I could edit / delete products from the cart

4 responses



I could successfully checkout from the cart

4 responses

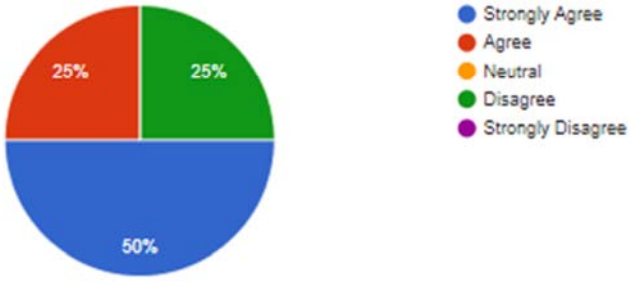
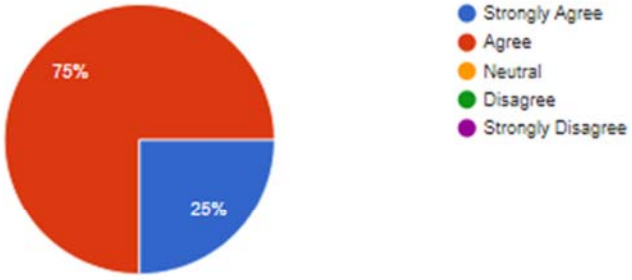


Figure 4: Satisfaction Survey Response

I could view my order status

4 responses



The system had provided with basic processes for an online food / grocery ordering system

4 responses

Figure 4: Satisfaction Survey Response

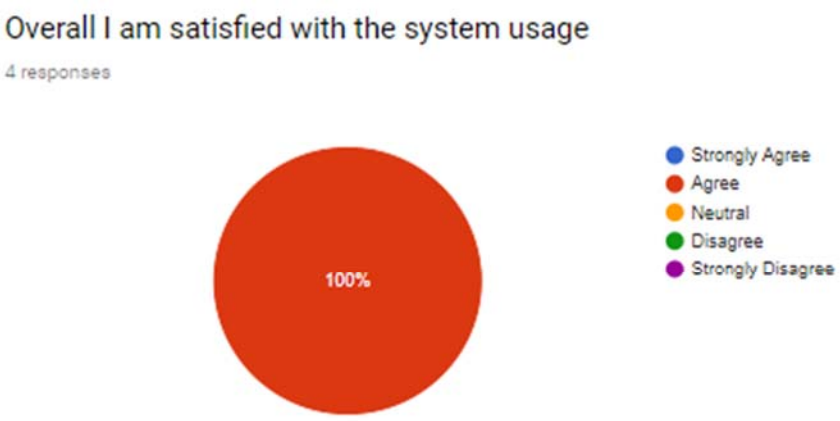


Figure 4: Satisfaction Survey Response

The pie chart shows the responses that we evaluated from the satisfaction surveys for Ux/Ui (Customers):

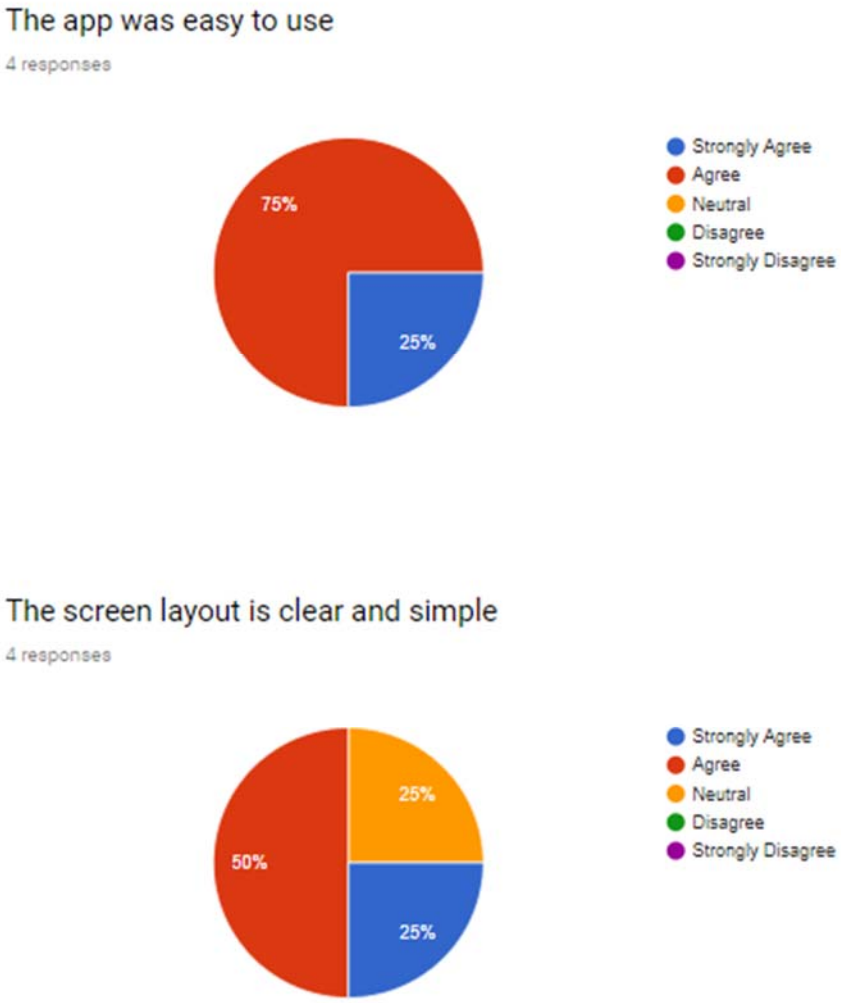


Figure 5: Ux/Ui Satisfaction Survey Response

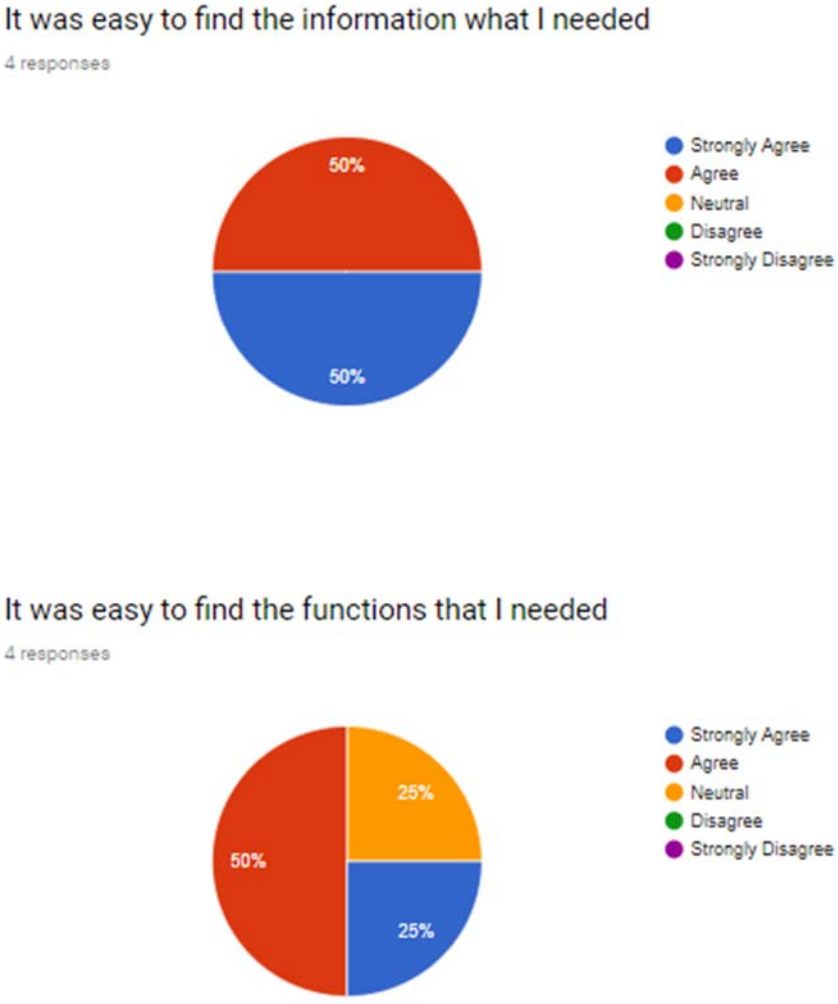


Figure 5: Ux/Ui Satisfaction Survey Response

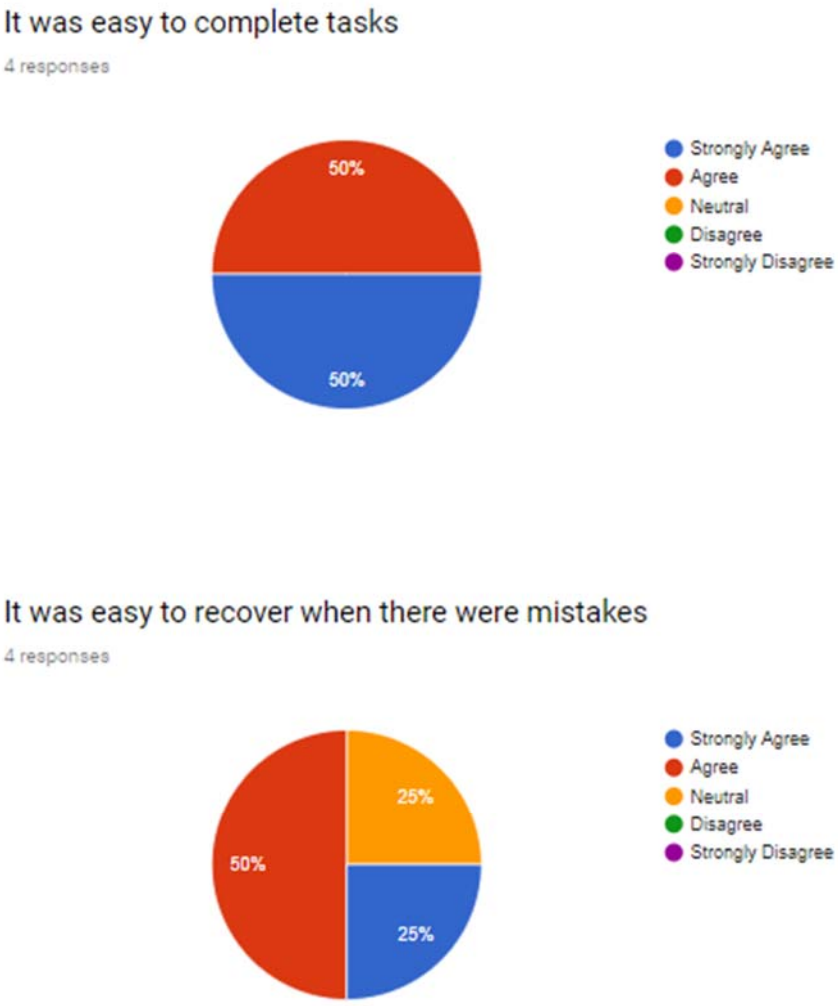


Figure 5: Ux/Ui Satisfaction Survey Response

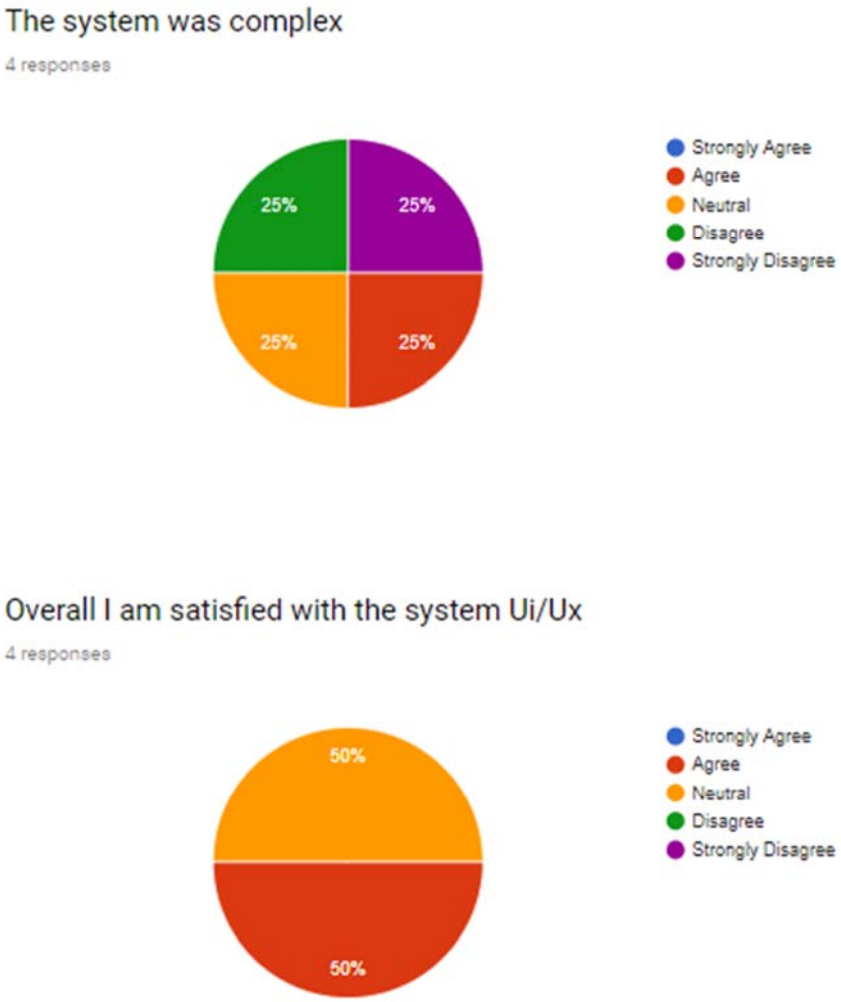


Figure 5: Ux/Ui Satisfaction Survey Response

Logical Design of the Application

- **Real-time Database Structure**

  Users:

  - Phone Number (Unique Key)
    - Address
    - Image
    - Name
    - Password
    - Phone
    - phoneOrder
    - Security Question

  Sellers:

  - Auto Gen ID (By Firebase Auth)
    - Address
    - Email
    - Name
    - Phone
    - SID (Seller ID)

  Admins:

  - Phone Number (Unique Key)
    - Name
    - Password
    - Phone

  Products:

  - Date and Time (Sec) (Unique Key)
    - Category
    - Date
    - Description
    - Image
    - PID
    - Pname
    - Price
    - productState
    - sellerAddress
    - sellerEmail
    - sellerName

- sellerPhone
- SID
- Time

Cart List:

- Admin View
  - Phone Number (Unique Key)
    - Products
      - Date&Time
        - Date
        - Discount
        - PID
        - pName
        - price
        - quantity
        - time
- User View
  - Phone Number (Unique Key)
    - Products
      - Date&Time
        - Date
        - Discount
        - PID
        - pName
        - price
        - quantity
        - time

Order:

- Phone Number (Unique Key)
  - State
  - Address
  - City
  - Date
  - Name
  - Phone
  - Time
  - totalAmount

- **Dataflow Diagram – Context Diagram [Level 0]**

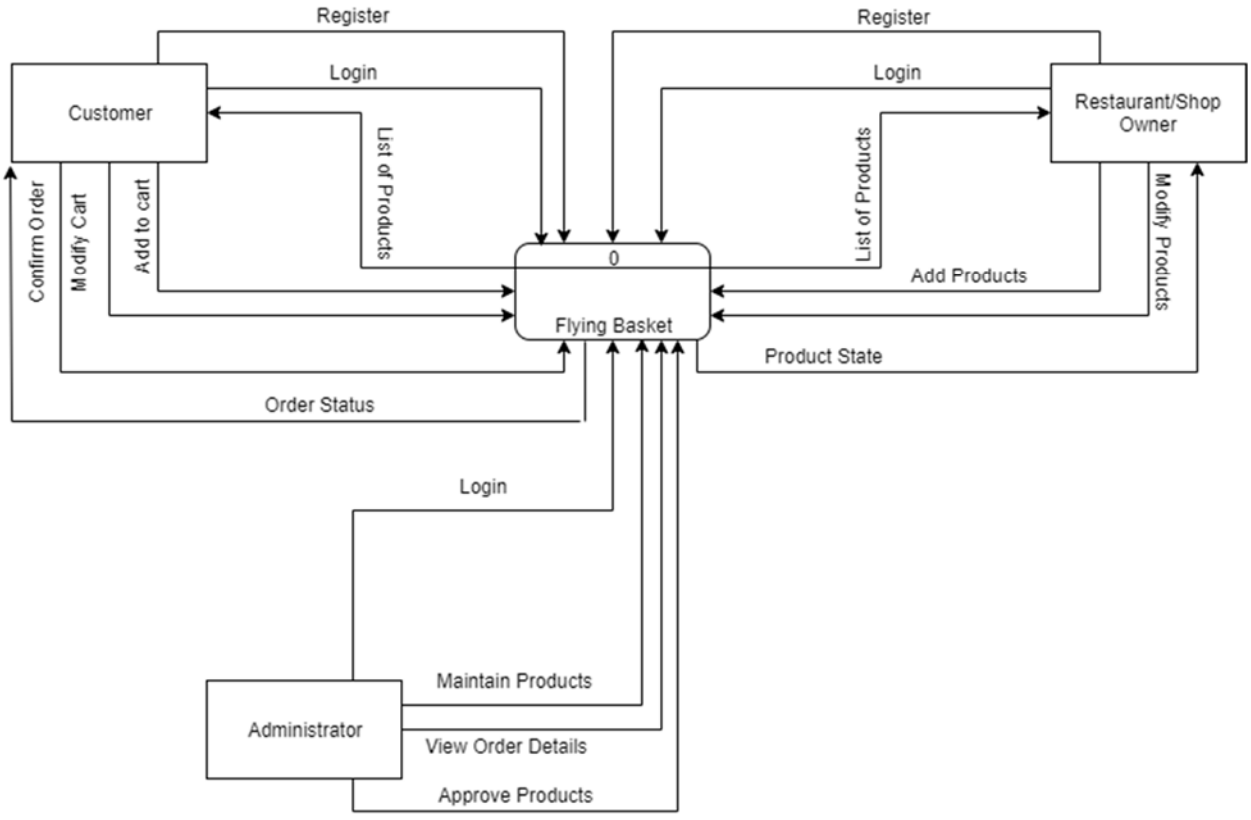


Figure 6: Dataflow Context Diagram [Level 0]

- **Dataflow Diagram – Customer [Level 0]**

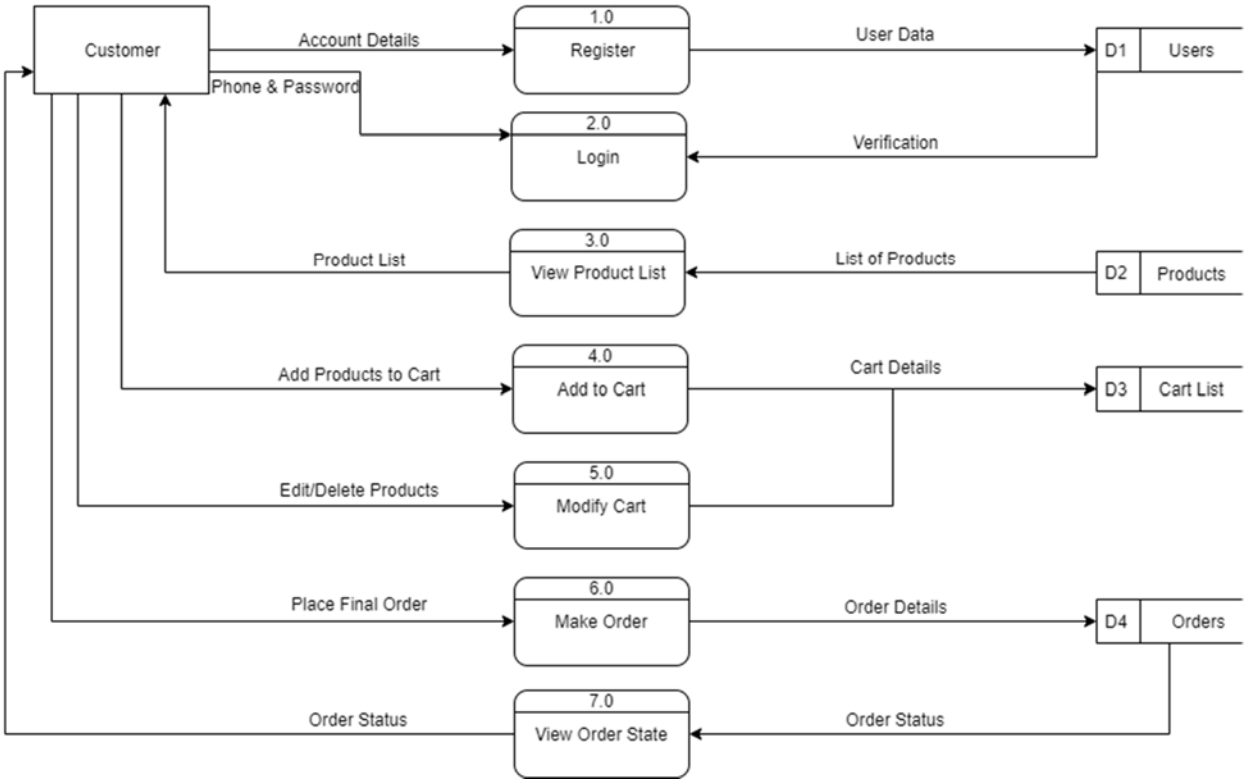


Figure 7: Dataflow Diagram – Customer [Level 0]

- **Dataflow Diagram – Restaurant/Shop Owner [Level 0]**

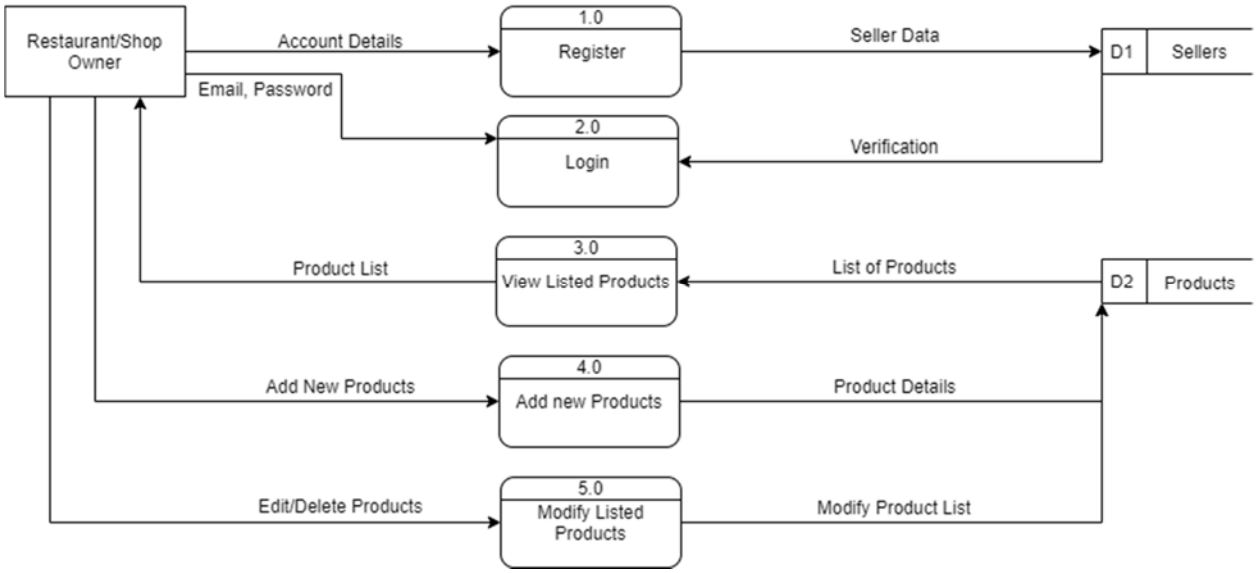


Figure 8: Dataflow Diagram – Restaurant/Shop Owner [Level 0]

- **Dataflow Diagram – Administrator [Level 0]**

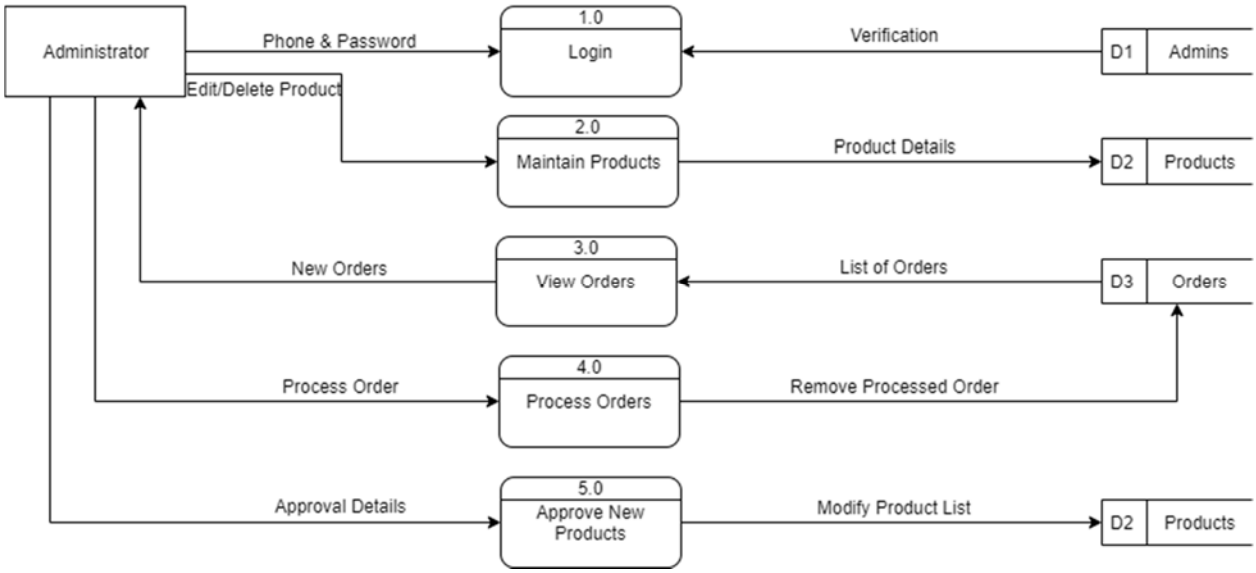


Figure 9: Dataflow Diagram – Administrator [Level 0]

Interface Design

Customer

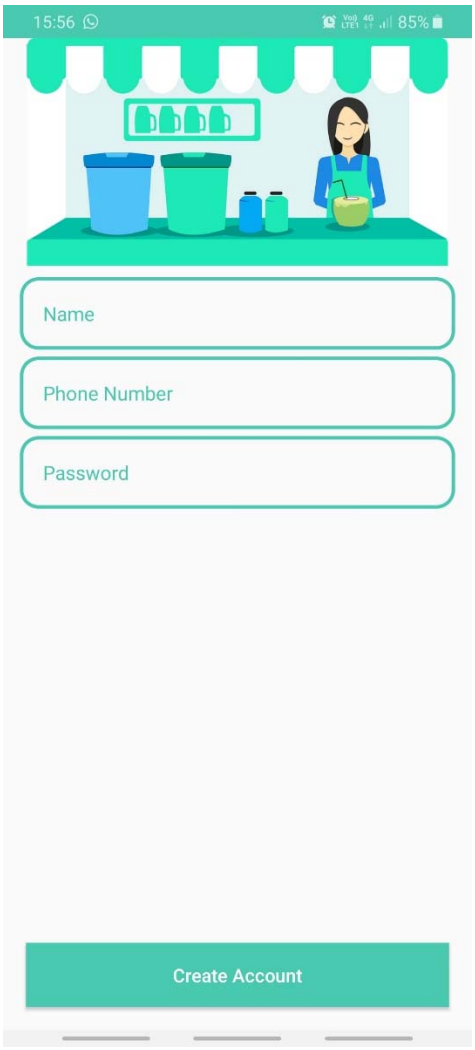


Figure 10: Registration Form

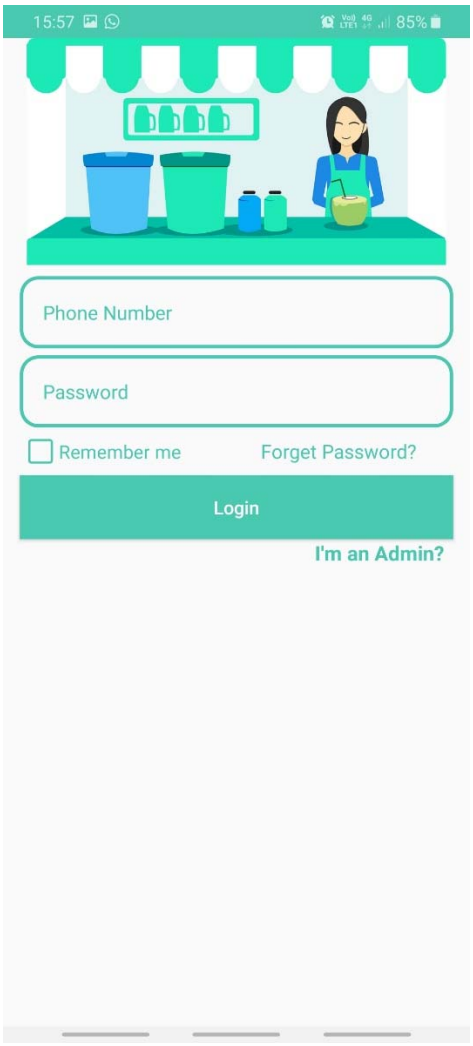


Figure 11: Login Form

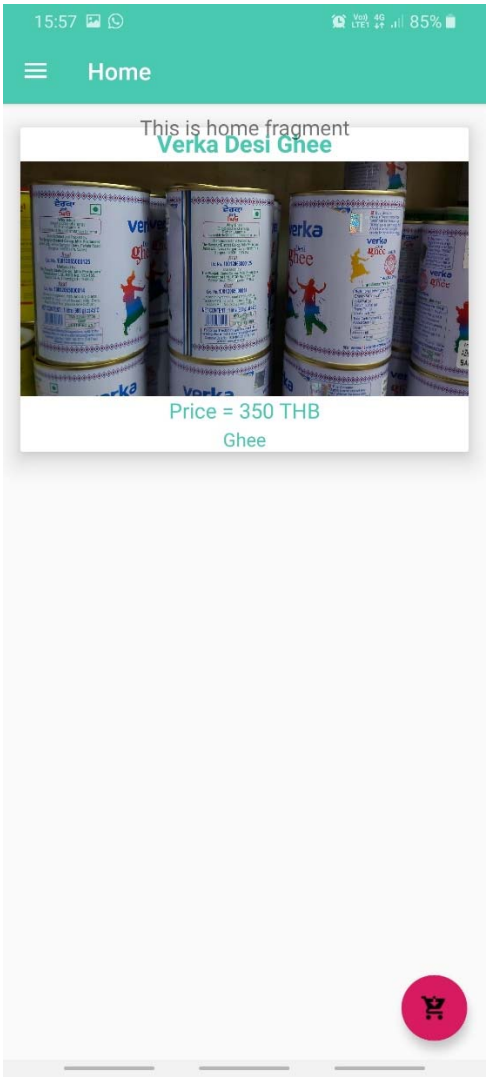


Figure 12: Home Activity

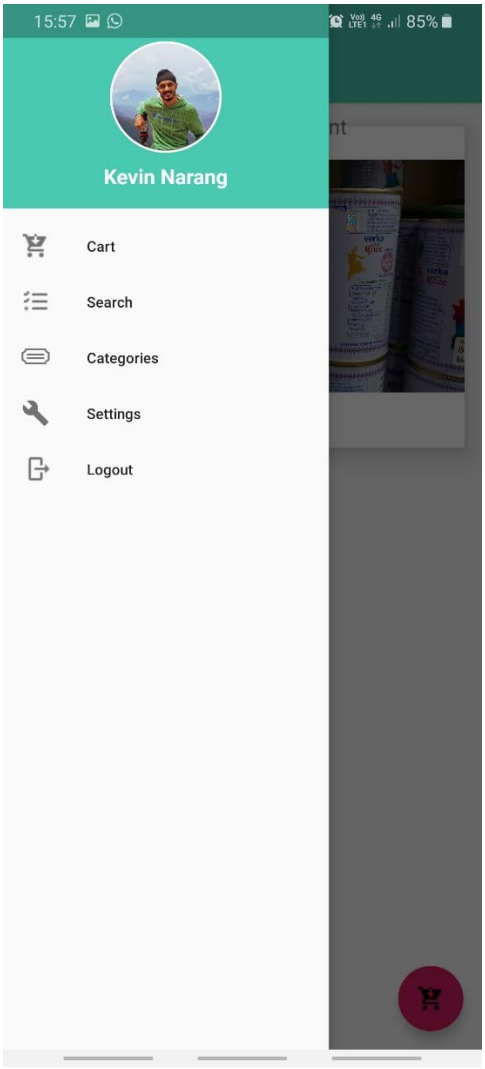


Figure 13: Navigation View

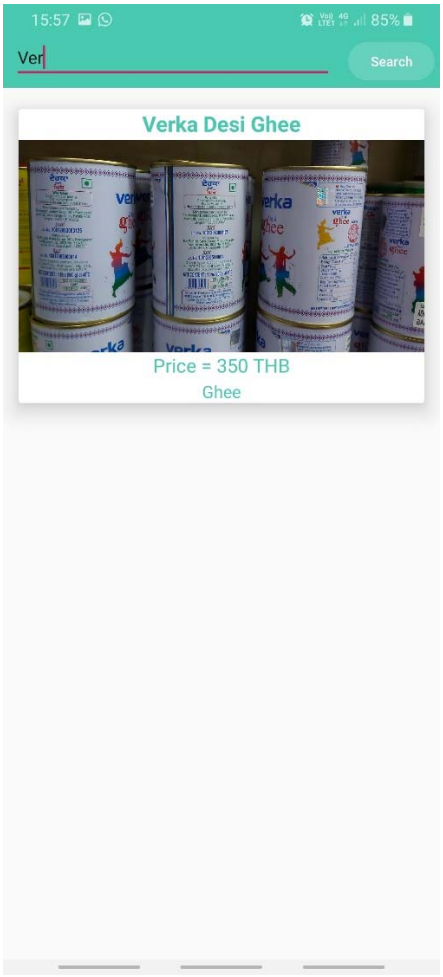


Figure 14: Search Activity

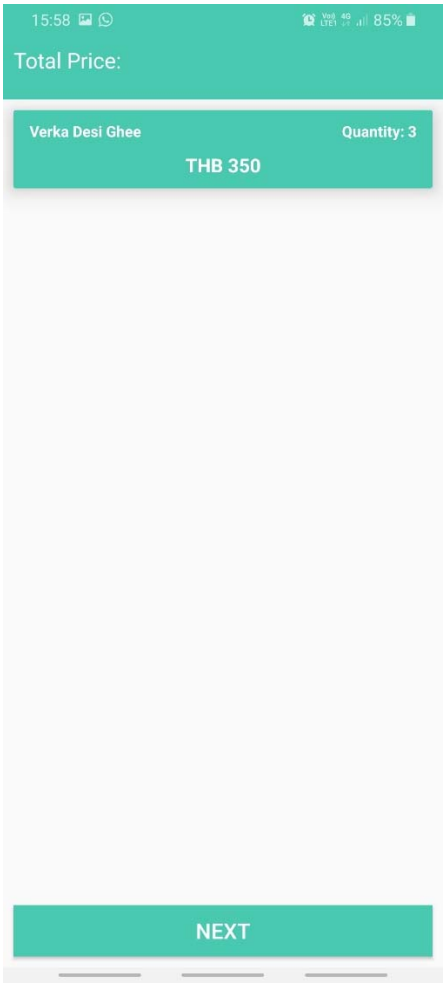


Figure 15: Cart List

Figure 16: Order Confirmation

Restaurant/Shop Owner

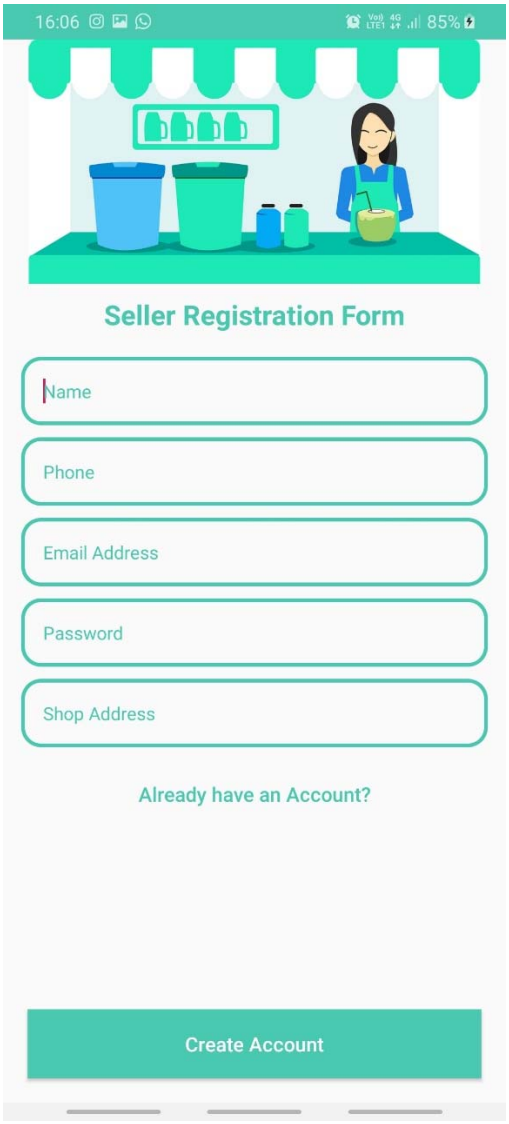


Figure 17: Registration Form

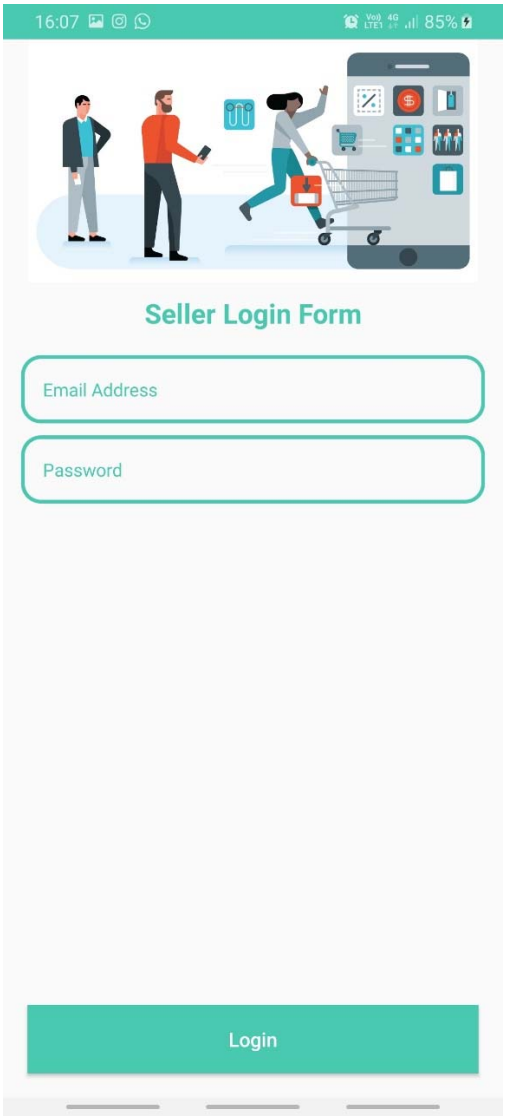


Figure 18: Login Form

Figure 19: Listed Products

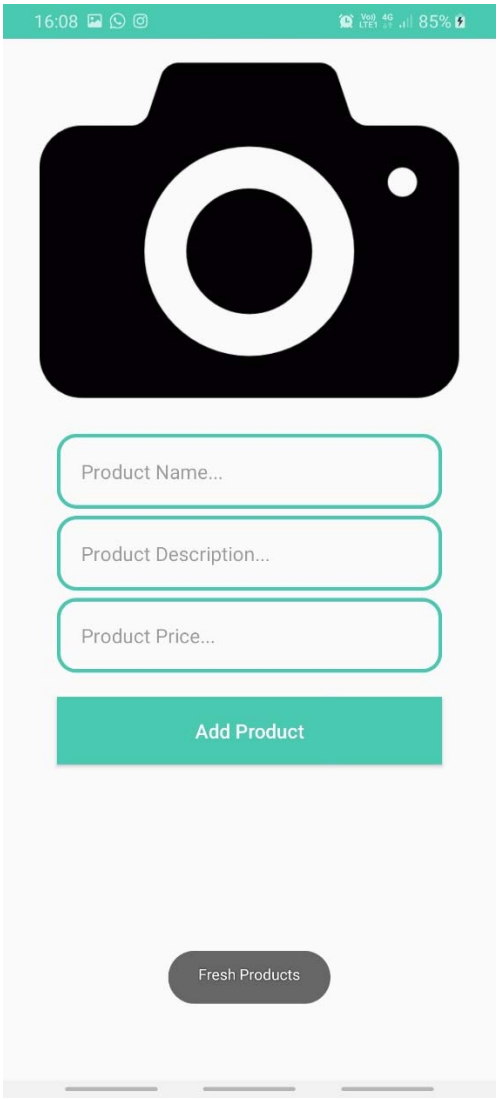


Figure 20: Adding New Products

Administrator

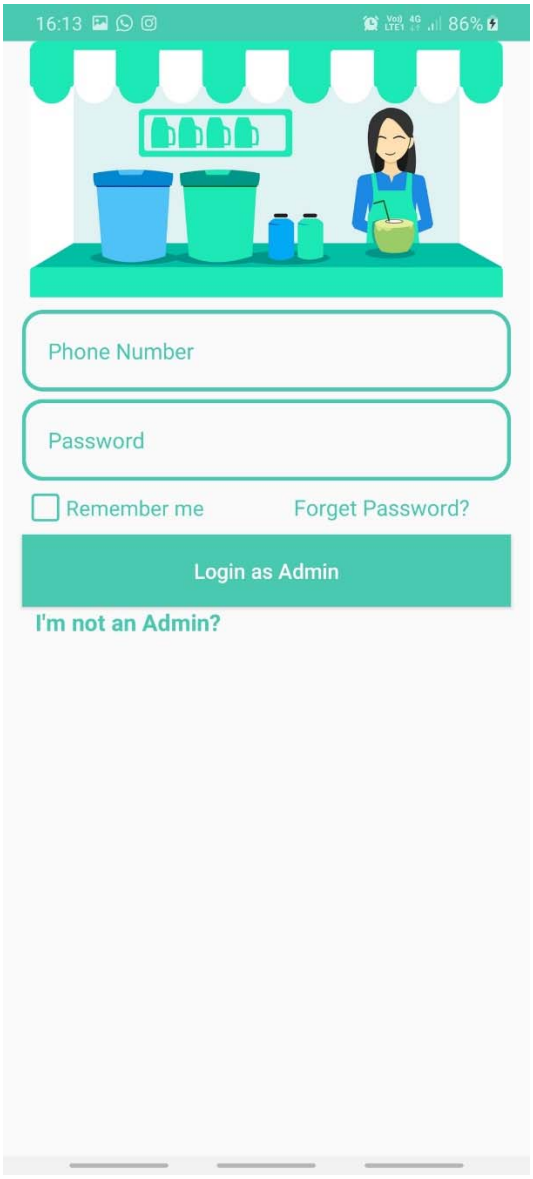


Figure 21: Login Form

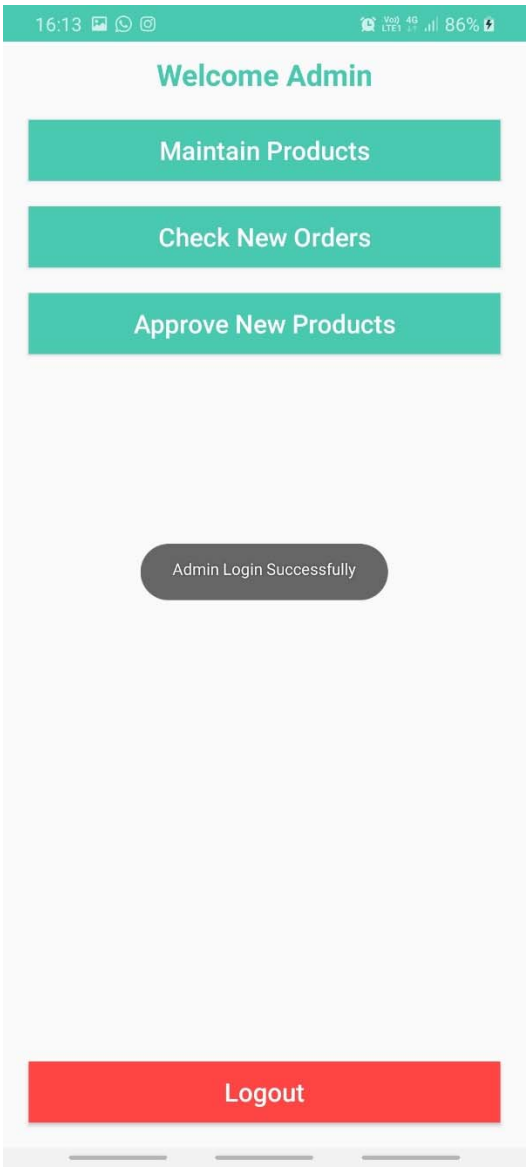


Figure 22: Admin Home Menu

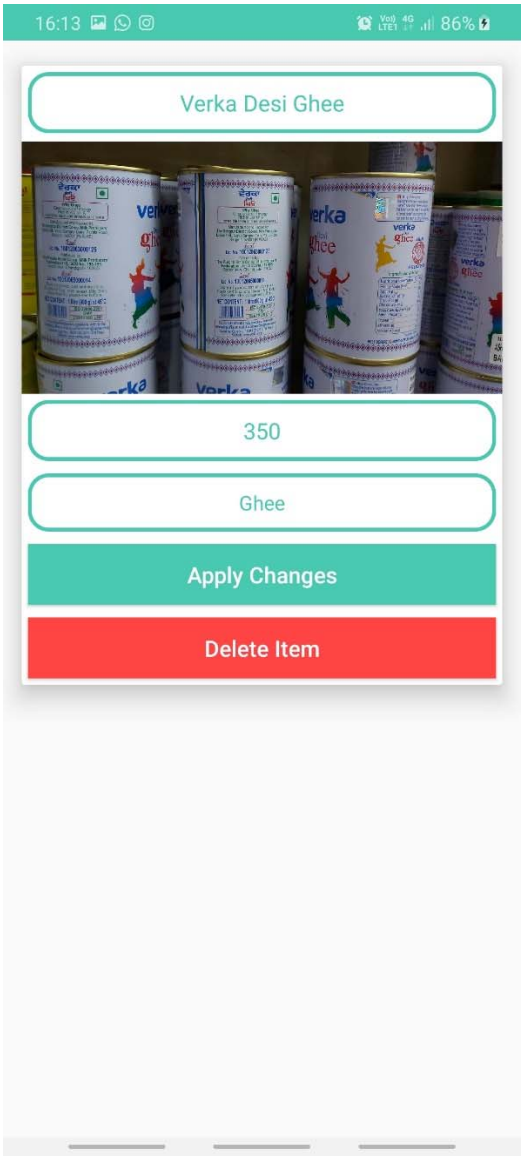


Figure 23: Product Maintaining

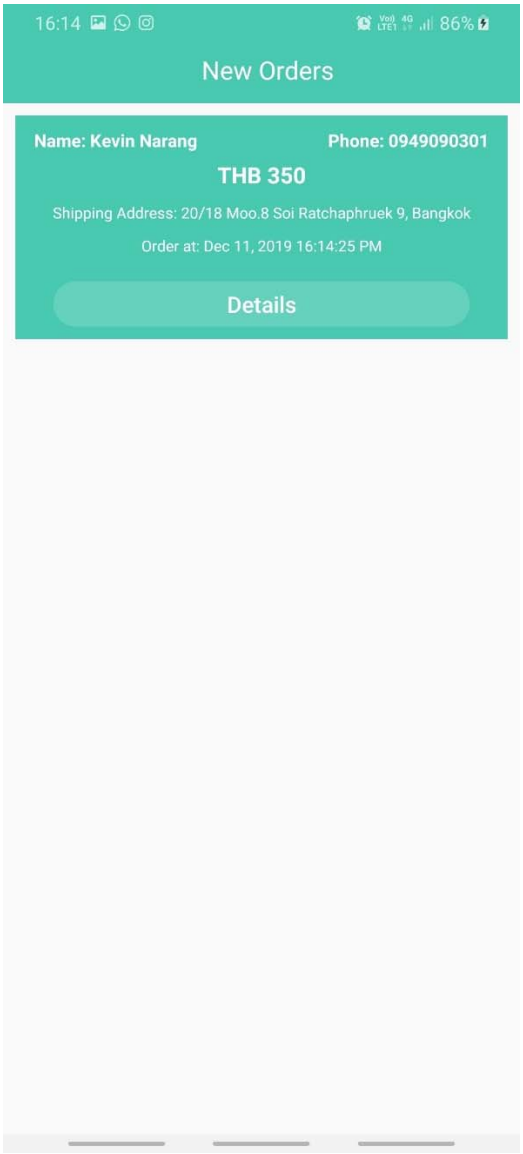


Figure 24: New Orders

Figure 25: Approve New Listings

Conclusion

Flying Basket is a mobile application. The state of the application is still in early stages but it does the basic functions that an online food/grocery shopping demands. All in all this application was made with the goal of having a system that can be used for ordering food and/or grocery online and be available as an ease of access to the Indian Community in Thailand.

What's next?

After this stage of the project the application's development process is not going to stop. This is more like a startup from now on. Bringing in new features and enhancing the current features will be available in the future. Also the application will be published into the Google's play store and Apple's iOS store. Features such as customer review, a better search algorithm, adding geo fences, etc. will be the main focus from now on. Going forward, hopefully the application can find the success it deserves.

Our Clients

At this stage of the application we already have secured a client. Our first client is Naresh Panich Store which is located in the heart of Little India (Phaurat Road) in Bangkok. They sell all kinds of Indian groceries and all of their products are imported from India. They have many regular customers and a dedicated office for their office work.

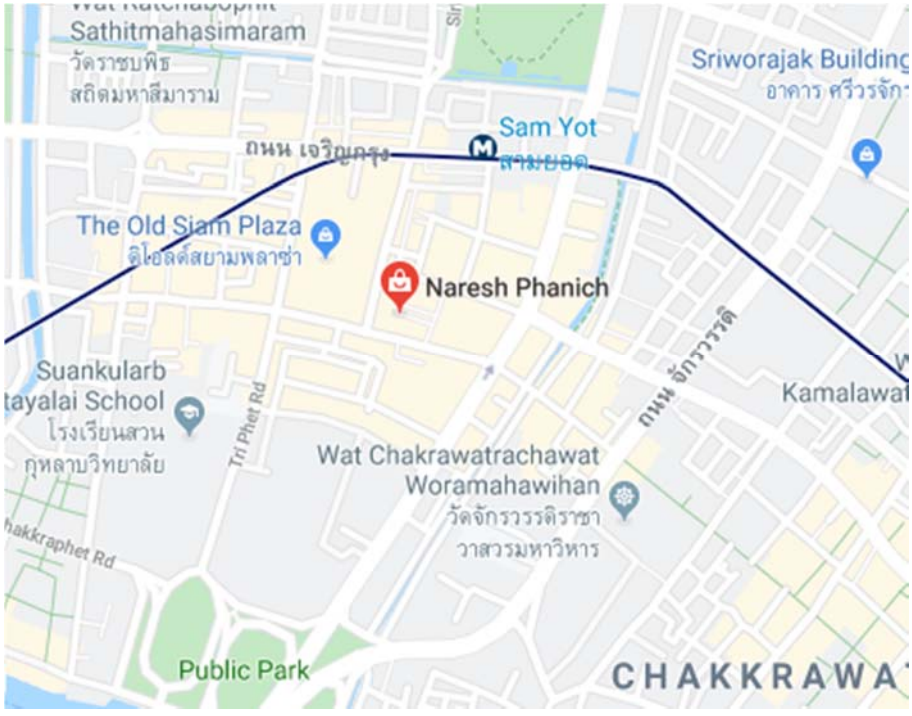


Figure 26: Naresh Panich Store Location

Reference

- https://stackoverflow.com/
- https://developer.android.com/studio
- https://github.com/

Dependencies used in application:

- https://github.com/rey5137/material
- https://github.com/hdodenhof/circleimageview
- https://github.com/pilgr/Paper
- https://github.com/arthurhub/android-image-cropper
- https://android-arsenal.com/details/1/4136