

PLANT CANTEEN PRODUCT APP

BISM3222 PROJECT REPORT
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SYSTEM VISION

1. PROBLEM DESCRIPTION

By the year 2050, global food consumption demand will soar by 70% (*Linehan, Thorpe, Andrews, Kim, Beaini, 2015*). However, every day we are also wasting 1/3 of the global food supply (*Mason, Boyle, Fyfe, Smith, Cordell, 2011*), Responsible Production and Consumption thus is listed as Target 12.3 of the 2030 Sustainable Development Goals (*FAO, n.d.*).

To address this emerging problem, we need a system to motivate self-sufficiency in producing food. Plant Canteen will be the one to achieve this.

Plant Canteen is a plant pot which convert food waste into food fertilizers for your plant. The Plant Canteen mobile app sold together would record and give suggestions on how you can regulate your diet to reduce food waste. In addition, extra food fertilizers can be sold and bought in the app.

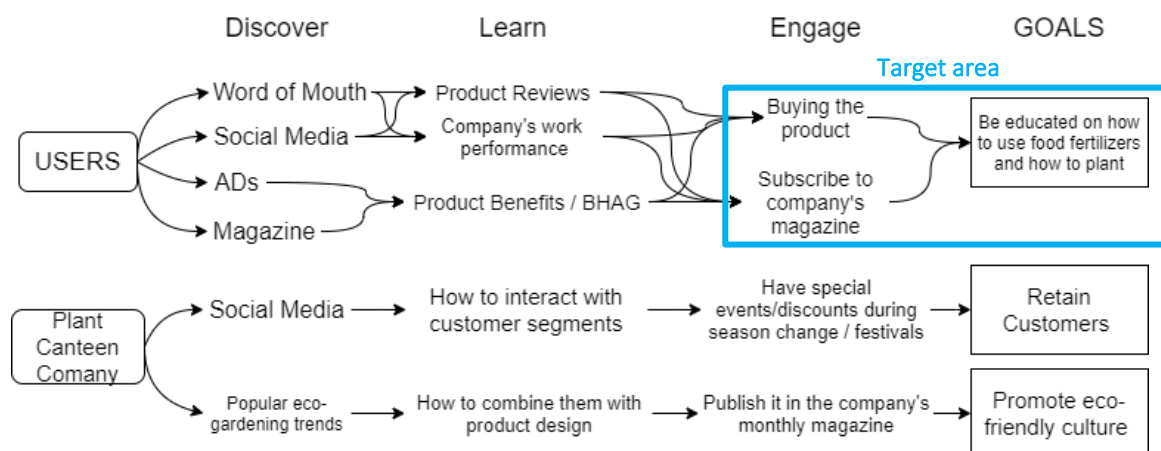
This eco-friendly plant pot not only regulates people's food waste habits, but it is also helping to combat a rising global food demand. Our product's Big Hairy Audacious Goal(BHAG) is to persuade consuming food responsibly to prevent global food loss.

With that set, 3 questions may arise in the process of achieving the BHAG:

- (1) DO USERS KNOW HOW, WHY AND WHAT FOOD WASTE CAN BE USED AS FERTILIZERS?
- (2) CAN THIS PRODUCT RETAIN CUSTOMERS IN LONG TERM?
- (3) CAN USERS GAIN AWARENESS ON ECO-FRIENDLY IN LONG TERM?

The following content of this report aims to explore the potentials of the Plant Canteen mobile app by answering the above questions, and gain insights on how to achieve the BHAG.

2. USER JOURNEY MAP



3. SYSTEM CAPABILITIES

The system should be capable to the following

3.1 HIGH LEVEL CAPABILITIES

3.1.1 Login / Log out Users

Using the instructions in the product manual, users can register an account with the product code. They can modify username and password in the Account settings page.

3.1.2 Collect and Display the Plant Information in App Wirelessly

After user adds a plant or seed into the Plant Canteen plant pot, the system should update to show the sunlight exposure, humidity and whether the food fertilizer is enough or too much. It can also switch from one plant pot to another if user has purchased multiple pots.

3.1.3 Generate Yearly/Monthly/Weekly Graph About User's Food Waste Usage

Depending on the amount of food fertilizer in the plant, the app can visualize the amount of food waste the user has reused.

3.1.4 Store and Display Fertilizer Product Posted by User and Its Orders

The system allows user to add a new product in the app and post it in the Plant Canteen's C2C online food fertilizer trading platform. User can view the orders they received and request for an arrangement of delivery from the company.

3.1.5 Store and Display Food Fertilizers Sold by Other Users

The system allows user to browse products, filter and search food fertilizers sold by other users, view product details and add products to shopping cart. They can also write reviews and track their orders' status.

3.1.6 Connect to Electronic Payment Platform to Checkout Items Bought

During checkout, the system should be able to redirect user to payment platforms like PayPal and their bank for a more security payment process.

3.1.7 Read Offline Company's Eco-gardening Magazine

The system allows user to read the company's monthly magazine for free. It introduces ideas like reusing household items to decorate their gardens and home. It also teaches beginners how to plant crops at home and also how to plant seasonal crops.

3.1.8 Connect Wi-fi to Browse Online Forum (from user feedback)

The system should incorporate an online forum where beginners seek instant help in the app. Though the forum is also available on the Internet, the mobile version of the forum is only available in this app.

3.1.9 Retrieve Information of Seasonal and Festival Promotion (from user feedback)

Every season and annual festivals, there will be special events in the forum and discounts in the online trading platform. Regular promotion builds customer relationships and thus retain them in long term.

3.2 TARGET AREA

The target area will be “how might users learn how to plant and use food fertilizers by buying the product/subscribing to the company’s magazines”. A good linkage between the Engage parts (“Buying the product” and “Subscribing to the company’s magazines”) and the Goal “Be educated on how to use food fertilizers and how to plant” will heavily depends on what is included in the product and magazine. As a result, most efforts and ideation need to be put into brainstorming how the Plant Canteen mobile app (combined with magazine) helps in achieving the goal.

For example, there could be tutorials and interviews with gardening experts in the content of the magazine. Another example could be a in-app online trading system for extra food fertilizers to motivate customers to learn about food fertilizers and planting in long term.

3.3 SOURCE OF INSPIRATION

3.3.1 Lua

Lua is a smart plant pot used with a mobile app.

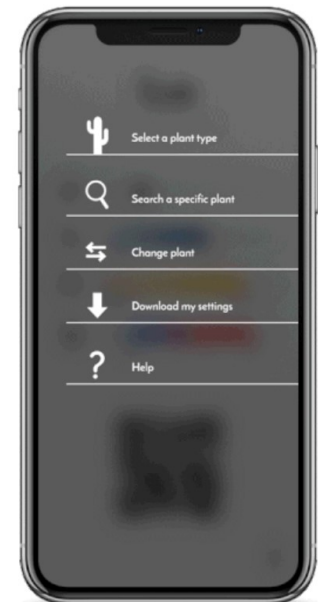
It can be used offline when monitoring the plant information.

Interestingly, how they backup data is by downloading the settings of the app, it could enhance the speed and response time compared to having the app constantly backup every 10 minutes. However, the pot needs to scan a QR code produced from the app to update information.

Muller, V. (August 3, 2019). *Lua, the smart planter with feelings!*. Accessed Online <https://www.indiegogo.com/projects/lua-the-smart-planter-with-feelings#/>

→ The consideration of backing up plant data is noted in Section 3.1.2.

→ The functionality of switching between multiple plant pots is also noted in Section 3.1.1.



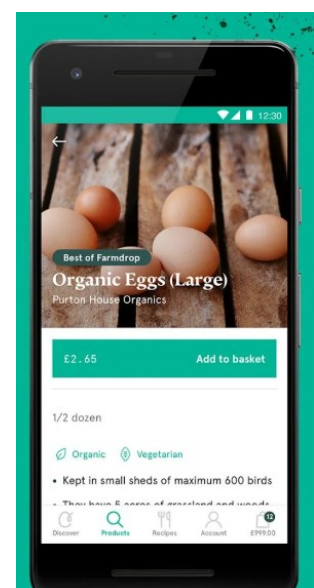
3.3.2 Farmdrop app

Farmdrop app is a farm-to-door style delivery service connects the user directly with local farmers. The company’s app helps in the transportation of the fresh food from farmer to buyers, which is also their revenue streams.

Farmdrop. (May 1, 2020). *Farmdrop Google Play*. Accessed Online <https://play.google.com/store/apps/details?id=com.farmdrop.customer&hl=en>

→ Plant Canteen’s revenue stream of helping customers to deliver food fertilizers is noted in later Section 4.1 Business Model Canvas.

→ The Browse, Shopping cart and Account button of the bottom navigation bar is inspired by the one in the app. (see Appendix 6)














4 BUSINESS BENEFITS

It is believed that Plant Canteen mobile app brings the below benefits to the company:

- Automate the process of company arranging transactions and deliveries for sellers and buyers, thus making the processing of transaction more efficient
- Lower time cost for food fertilizer buyers and sellers to reach each other, especially if they want to access low cost fertilizers nearby their place.
- Instant retrieval of multiple plants' condition which users can access anywhere they go, in other words, it is portable)
- Rapidly approaches customers with promotional events and discounts, thus customers will be more engaged into the product
- Retain customers by building a self-help network in the online forum, since customers can get instant responses to their questions
- Cultivate an eco-friendly culture in farming and gardening

4.1 BUSINESS MODEL CANVAS

 Key Partners <ul style="list-style-type: none"> - Raw material suppliers - Crop fertilizer vehicle suppliers - Mobile app developers 	 Key Activities <ul style="list-style-type: none"> - C2C crop-fertilizer trading with mobile app - Weekly offers in crop-fertilizer transport - Seasonal special discounts - Magazine promoting eco-gardening  Key Resources <ul style="list-style-type: none"> - Mobile app - Production, IT and Customer Support Staff - Eco-gardening Monthly magazine - Vehicles to transport fertilizers - Online Forums 	 Value Propositions <ul style="list-style-type: none"> - Eco-friendly - Sustainable - Food waste recycling - Self Sufficient 	 Customer Relationships <ul style="list-style-type: none"> - Personal assistance in physical stores - Self-service in mobile app - Community  Channels <ul style="list-style-type: none"> YouTube series introducing how the company works, and food waste fertilizers FB & Instagram for seasonal promotional event & IT support Mobile app Online Forums 	 Customer Segments <ul style="list-style-type: none"> - Young adults (18-30 year old) who like gardening and wants to earn extra money in spare time - Farmers who need crop fertilizers
 Cost Structure <ul style="list-style-type: none"> - Cost of developing mobile app 	<ul style="list-style-type: none"> - Cost of Product manufacturing - Cost of staff - Cost of vehicles 	 Revenue Streams <ul style="list-style-type: none"> - Plant Canteen pot - Monthly subscription of company magazines 	<ul style="list-style-type: none"> - Revenue from transporting food fertilizers 	
 Social & Environmental Cost <ul style="list-style-type: none"> Cost of air pollution produced by vehicle deliveries Cost of air pollution from product manufacturing 	 Social & Environmental Benefit <ul style="list-style-type: none"> Reduce Food Waste Alleviate Food Consumption Demand 			

<http://www.businessmodelgeneration.com>

In terms of revenue streams, while the Plant Canteen Pot and the mobile app are one-time purchase, the long-term revenue depends on delivery fee of food fertilizers. Outside the mobile app, monthly subscription of the company's magazine in physical stores will also be part of the model but is not included in the app as it is free in the app if customer purchase the pot.

In cost structure, the cost of vehicles and product manufacturing will probably dominate the total cost since they require high maintenance in daily operation. The cost of developing the mobile app may depend on how many new features needed to be updated.

The social and environmental benefits will be reducing food waste and alleviating food consumption demand. Its cost could be the possible water and air pollutions from product manufacturing and transportation of fertilizers.

In terms of customer relationships, while the physical product (Plant pot) is being sold, the mobile app is given to the customer for free to track plant information (self-service) and sell extra food waste fertilizer. Other than that, the app plays the role of a food fertilizer trading platform, which motivate customers to make full use of the Plant pot. Furthermore, the online forum in this app allows customers to get instant help for how to manage plants. In this way, customers can build a community to help each other and strengthen customer retention.

In case customers need IT support, they can tap on the support page of the app and find contact details of staff to receive personal assistance.

In terms to key activities, there are daily, weekly, monthly and annual activities. Daily reminder of plant care, weekly offers in free order delivery services, monthly eco-gardening magazine and annual agricultural-related festivals (e.g. Thanksgiving).

4.2 INFORMATION SYSTEM DEVELOPMENT APPROACH

The model will be implemented using the AGILE SCRUM approach.

In the aspect of task allocation, SCRUM's Kanban board provides a visual organisation of task scheduling in this project. It first breaks down chunks of requirements into product backlogs, and then allocate them into phrases like "To-do", "Doing", "Needs Review", "Done". This compared to doing task allocation verbally, is easier to remember and manage. Nonetheless, when it comes to reporting project progress, Kanban board will be more efficient to illustrate the deliverables.

In terms of quality assurance, SCRUM's 2-4-week sprint allows consistent iteration of the Software Development Life Cycle. This is especially useful when Project plan phrase is repeated to rectify goals (e.g. budget and time) in big projects, Requirement phrase is repeated to adapt clients with unclear requirements, and Maintenance phrase is repeated to create a feedback loop. Noted that this may worsen the effect of a scope creep if the Requirement phrase in each sprint is done badly. (e.g. Bad design of interview questions)

In reflecting work problems, SCRUM's 3 ceremonies will encourage me to identify current challenges each sprint and ask for help. Sometimes keeping a work problem secret could slow down the progress of the project and demotivate us. Having a daily stand-up meeting could report our progress and problems that others may be able to answer or beware of.

5 PROJECT PLAN

Name of Step	Deliverable	Time to Complete	Date to be Completed
#1 Values, Problem Focus & Goal	Problem Description BHAG	2h	Week 1
#2 Pitching the Project & Approach	1) Decision of Project's Approach and justification 2) Business Model Canvas 3) Project Plan	1h	Week 2
#3 Investigating Requirements	1) User Story Map 2) System Capabilities (List of functional and non-functional features that the users want)	1h	Week 3
#4 User Journey & Storyboarding	1) User Case Description 2) Use Case Diagram 3) Activity Diagram 4) Sequence Diagram 5) Domain Class Diagram	7h	Week 6
Week 7 Mid-Semester Exam			
#5 Prototyping	UX/UI prototype with Adobe XD	5d	Week 8
#6 User Testing & Feedback	Feedback report	1w	Week 9
#7 Architecture & Deployment	Decision on architecture strategy and justification	1w	Week 10
#8 Real-World Considerations & Reflection (Final Advice Point)	Project report	7-9d	Week 11

Throughout the semester, the making of deliverables are taught in weekly tutorials and lectures so for the first 3 weeks, the project is followed up weekly.

Next, in the paused week plus Week 4, 5 and 6, the practice of drawing the 4 diagrams with draw.io will require at least 2 weeks: 1 week for the actual drawing of the diagrams (see **Appendix 1,2,3,4**), and the remaining for reiterating based on tutor's feedback. In addition, a storyboard with paper-sketches of the ideal user experience and user interface will be produced for the later prototype. It is done before the exam as drawing and labelling is not a hard work (see **Appendix 6**).

After mid-semester exam in Week 7, Week 8 will be focusing on making an Adobe XD prototype (see **Appendix 5**), and also brainstorming the task flow for the later user testing plan. Since I have experience in Adobe XD prototyping, no time is needed in learning to use the software.

After this, in week 9 the task and questions of user testing plan is written (see **Appendix 7**), then 5 potential stakeholders will be contacted and interviewed with WhatsApp/Messenger video call. The transcripts are included in the report (see **Appendix 8**). The whole process will take 1 week to complete and summarise the results to answer the 3 sprint questions.

Finally, the remaining time will be used to write up an implementation plan and merge every element in the project report, which takes 1 week for writing and another week for making changes base on feedbacks and consultation.

NEXT STEP

1. REFLECTION

Since I am managing 5 courses this semester, the issue of time management is critical in affecting the quality of deliverables. There is not enough time use to consulting lecturer for project feedback but rather with tutors within tutorials, thus next time regular consultations should be marked in the calendar as a reminder. Other than that, consultation appointments should have been booked at least 5 days earlier since when I tried to book one, most time slots have already been occupied.

In prototyping, additional pages should have been made in order to reflect the task flow of the product app. For example, during the test, as the page about the order details of user's sold product is not made, most testers are confused as to why is the UI for order status is so simple. During the user testing, some tester raised concerns on the prototype design, like they did not realize that the page is about "Selling Your Fertilizer" since its UI looks like the Browse page.

It would be better if the prototype is developed after the task is written so that user experience can be clearly imagined.

For the user testing method, I should have asked the testers to place their phone camera (because it is a mobile video call) in a location where both the tester and their laptop can be seen. This is because I can either observe their reactions, but page and UI the testers are seeing is not known, or I know what page they are on but cannot see their facial reactions.

In drawing the storyboard, it would be better if each page is drawn sequentially from top to bottom and from left to right so that it is easier to brainstorm the task flow for user testing plan.

Lastly, in the aspect of creating diagrams, more consultation from lecturer is needed to validate the usage of diagram's notation because online sources may not be approved by the marker of the project. However, recommended web sources such as tutorial videos from Lucidchart could also be used as a reference.

2. IMPLEMENTATION PLAN

In terms of the architecture for deployment, **mobile device will be the client where the app is deployed.** It is because software toolkits, APIs and libraries for mobile development is **mature to support this system and is easy to use.** For example, the app can use Firestore Realtime Database to connect, import and perform CRUD operations on database with ease, and possibly use Flutter Dart plugin to make interactive navigation UIs. Furthermore, programming languages for developing mobile app like Java and XML is widely-practiced by most programmers, thus less training is needed for developers.

Overall, because this system serves as a platform, it should be able to support n-tier Client-Server architecture to improve load-balancing of network traffic. As a result, **the highest cost of development is the cost of maintaining the server.** This system will have to store loads of information from the online trading platform and forum, so it is vital to **put most computing resources into scaling up storage capacity while lowering probability of crash and failure.** In long term, it may have to be deployed into the AWS Cloud platform, so that the server is configured easily, more fault tolerant and scalable. However, the cost is still high as the company have to pay a monthly rent to the virtualized server where data is stored.

In the beginning stage of marketing the app, **Google Play Store** would be a better platform to test the app's popularity. It has **relatively less restrictions and wider user base** than other publishing platforms like Apple and Samsung App Store. With this said, the system shall be initially **designed for Android IOS using Android Studio or Visual Studio as development environment.**

The company's IT staff shall be trained in maintaining the system. After deploying the system, **the availability of the system server needs to be assessed regularly** so that the IT department can estimate precisely how often to backup data and close the server for maintenance. Otherwise, the server will crash without notifying the users and all data since previous backup will be lost.

Furthermore, staff should be **trained to answer customer's inquiries on the app's IT issues.** After development and testing, there may still be occasional bugs when downloaded into user's mobile devices. For instance, the API version depended on user's device model, if way lower than the app's API version, then some UIs or features may cause the user's phone to crash (e.g. Samsung S3 has API of 16, while the app supports phone with API 27 or higher as customized mobile notification can be made). These errors may not be discovered during unit/system/user testing, so staff must also report those bugs to app development team.

In addition, training on how to manage customer refunds in transactions and recover user's loss data is also crucial in aiding user experience.

Within the next iteration, **security concerns** for a mobile environment shall be addressed as currently the technology of mobile virus control is not mature. Further research in mobile security software needs to be done.

For example, to prevent company's central database being hacked through customer's mobile phone, the app should contain a simpler database containing only necessary information. It fetches sensitive data from company's central database only when user requests to.

SYSTEM REQUIREMENTS

1. FUNCTIONAL REQUIREMENTS

1.1 Tracks plant's information

- 1.1.1 User adds the plant on the Plant Canteen pot, app updates information
- 1.1.2 User tracks humidity, sunlight exposure and amount of food fertilizer
- 1.1.3 User can switch to from one plant pot to another

1.2 Tracks weekly/monthly/yearly food-recycling habit with graphs

1.3 Sells extra food fertilizers produced

- 1.3.1 Fertilizer trader adds new food fertilizer product
- 1.3.2 Fertilizer trader edits product details
- 1.3.3 Fertilizer trader deletes product details
- 1.3.4 Fertilizer trader gets notification about their product's new order
- 1.3.5 Fertilizer trader arranges delivery with Plant Canteen company
- 1.3.6 Fertilizer trader updates order status

1.4 Buy food fertilizers

- 1.4.1 Fertilizer buyer browses available food fertilizers
- 1.4.2 Fertilizer buyer filters search results
- 1.4.3 Fertilizer buyer views product details
- 1.4.4 Fertilizer buyer adds product to shopping cart
- 1.4.5 Fertilizer buyer confirms payment method and delivery address during checkout
- 1.4.6 Fertilizer buyer receives email invoice after finishing shopping
- 1.4.7 Fertilizer buyer tracks orders

1.5 Reads eco-gardening magazine

1.6 Modifies user account information

- 1.6.1 User changes password/username
- 1.6.2 User deletes account

1.7 Online Forum

- 1.7.1 User searches for threads
- 1.7.2 User views a thread
- 1.7.3 User bookmarks a thread
- 1.7.4 User likes a thread
- 1.7.5 User comments on a thread
- 1.7.6 User posts new threads

2. USABILITY REQUIREMENTS

- 2.1 The system should be able to auto-update plant's information wirelessly.
- 2.2 The system should send receipts via email.
- 2.3 The system should be able to track at least 3-4 plants at the same time.

3. RELIABILITY REQUIREMENTS

- 3.1 The system should be able to backup app's data automatically
At 24:00 every night in case a need for data recovery or server crash.
- 3.2 The system server should have less than 14 days of planned outages per year.
- 3.3 The system should maintain at least 93% total availability per year.

4. PERFORMANCE REQUIREMENTS

- 4.1 Every page should be reached within 3 UI/button clicks for simplicity
- 4.2 The system should be able to update plant's information every 3 seconds.
- 4.3 The system should be able to update plant's information offline
to save Internet data.
- 4.4 The system should be able to refresh forum threads every 5 minutes.
- 4.5 The system should be able to process at least 10 transactions per second.

5. SECURITY REQUIREMENTS

- 5.1 The central database of the company should not be used in the app. Instead use a simpler database which only stores necessary and non-sensitive information. Sensitive data should be retrieved only when user requests to
- 5.2 Only Plant Canteen staff and account owner can manage account data
- 5.3 Only Plant Canteen staff can be the administrator of the online forum
- 5.4 Only under user's permission in transaction, authorised electronic payment platforms and banks can retrieve user's financial information
- 5.5 Plant Canteen should notify user new Terms and Conditions whenever there is a system update include modifying sensitive data of the database

REFERENCES

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Mason, L., Boyle, T., Fyfe, J., Smith, T., Cordell, D. June 2011. ***National Food Waste Assessment***. Institute for sustainable futures, University of Technology Sydney. Accessed online <https://www.environment.gov.au/system/files/resources/128a21f0-5f82-4a7d-b49c-ed0d2f6630c7/files/food-waste.pdf> Viewed April 17, 2020.

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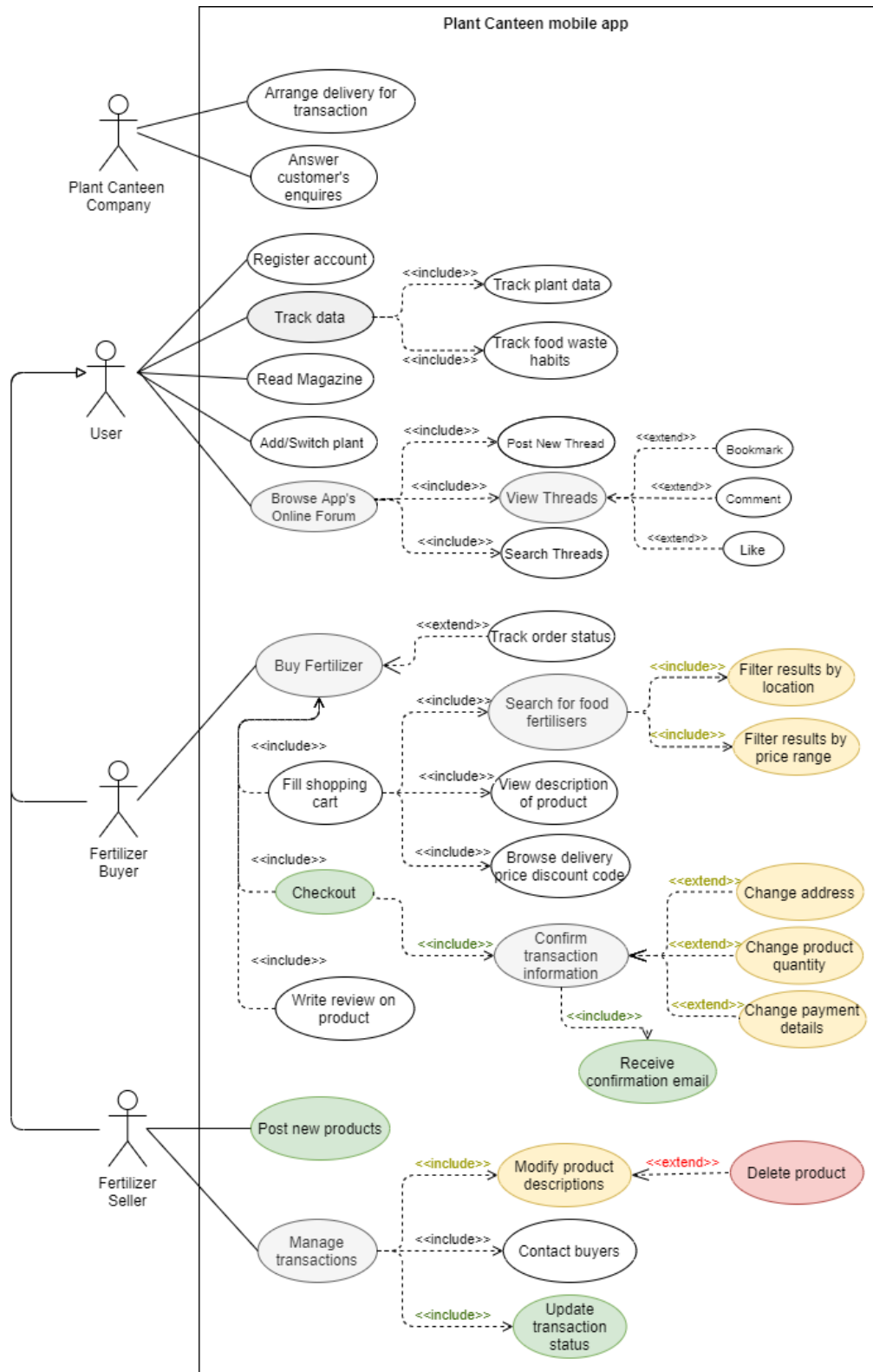
Muller, V. August 3, 2019. ***Lua, the smart planter with feelings!***. Accessed online <https://www.indiegogo.com/projects/lua-the-smart-planter-with-feelings#/> Viewed April 28, 2020.

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APPENDIX

1. USE CASE DIAGRAM

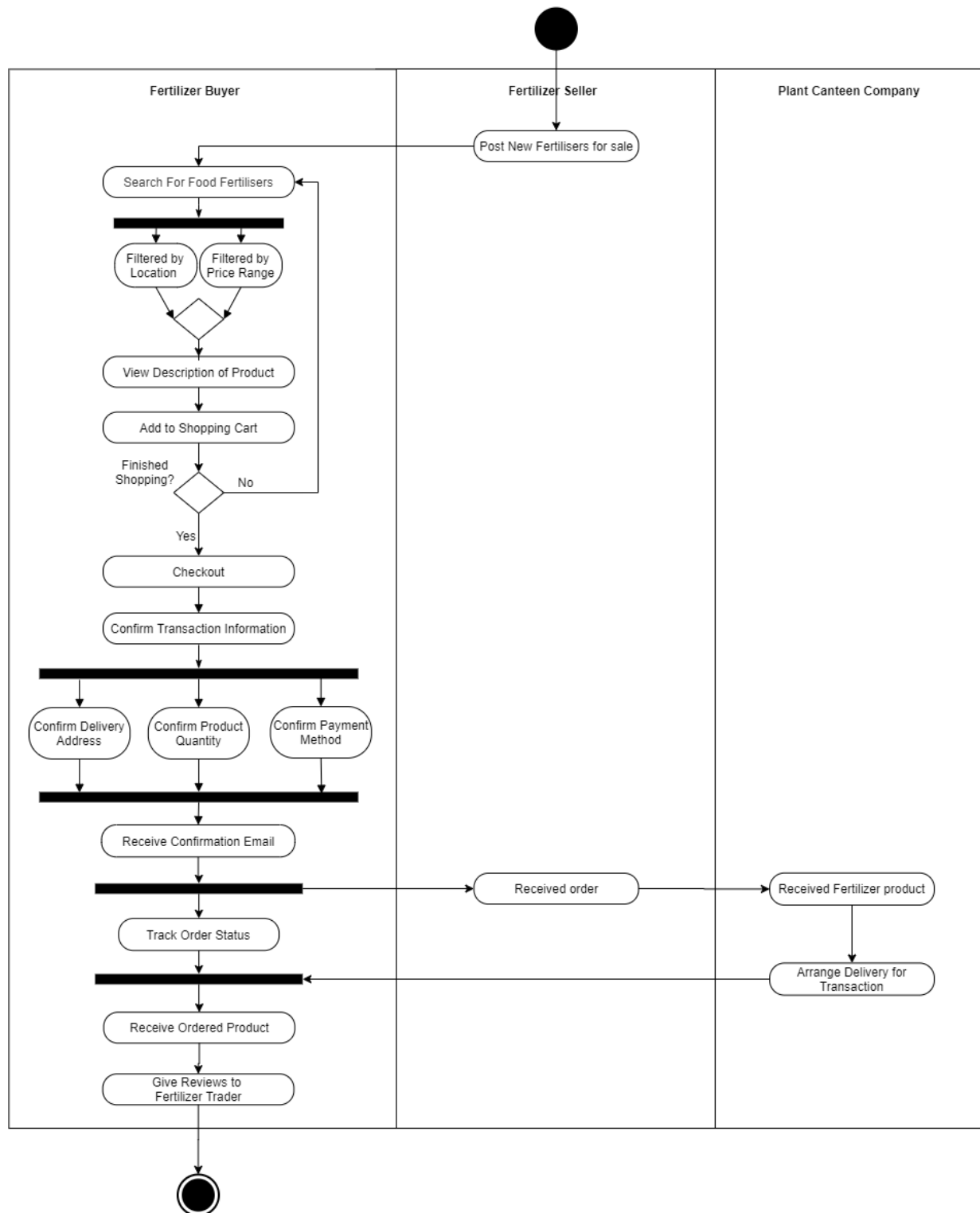


2A. USE CASE DESCRIPTION

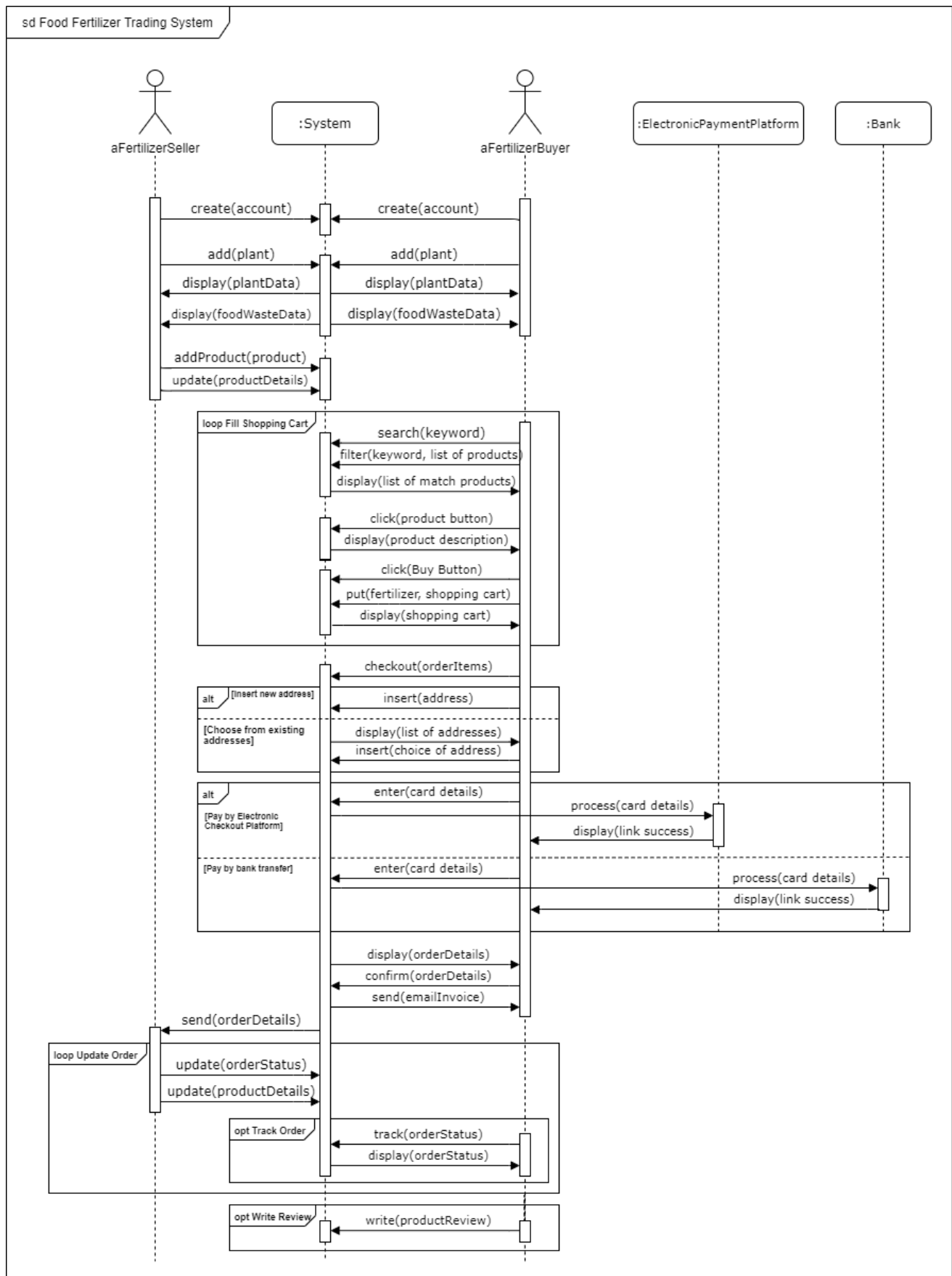
<u>Use Case Name:</u> Plant Canteen Fertilizer Selling	<u>ID:</u> 1	<u>Importance Level:</u> <i>High</i>
<u>Primary Actor:</u> Fertilizer seller Fertilizer buyer	<u>Use Case Type:</u> <i>Overview and Real</i>	
<u>Stakeholders and Interests:</u> Fertilizer seller – wants to sell food fertilizers to Fertilizer buyer Fertilizer buyer – wants to buy food fertilizers from Fertilizer seller Plant Canteen Company – arrange delivery of food fertilizer transactions		
<u>Brief Description:</u> This use case describes the how users sell food fertilizers in a mobile product app.		
<u>Trigger:</u> Fertilizer seller produced extra food fertilizer using the Plant Canteen product Type: <i>External</i>		
<u>Relationships:</u> ➤ Associations: Fertilizer seller, Fertilizer seller, Plant Canteen Company ➤ Include: NA ➤ Extend: NA ➤ Generalizations: User, Fertilizer seller, Fertilizer buyer		
<u>Normal Flow of Events:</u> 1. Fertilizer seller add food waste into plant pot. 2. Fertilizer seller tracks food fertilizer data in app. 3. Fertilizer seller produce extra fertilizer. 4. Fertilizer seller enters Sell Fertilizer page. 5. Fertilizer seller views/adds/edits/deletes product details. 6. Fertilizer seller receives order from Fertilizer buyer. 7. Plant Canteen Company arranges delivery for this transaction. 8. Plant Canteen Company pick up fertilizer from Fertilizer seller. 9. Fertilizer buyer received fertilizer from Plant Canteen Company. 10. Fertilizer buyer writes review for the received product.		
<u>SubFlows:</u> NA		
<u>Alternate/Exceptional Flows:</u> ➤ In Step 3, if the Fertilizer seller did not produce extra fertilizer, return to Step 1.		

2B. ACTIVITY DIAGRAM OF SELLING FERTILIZER

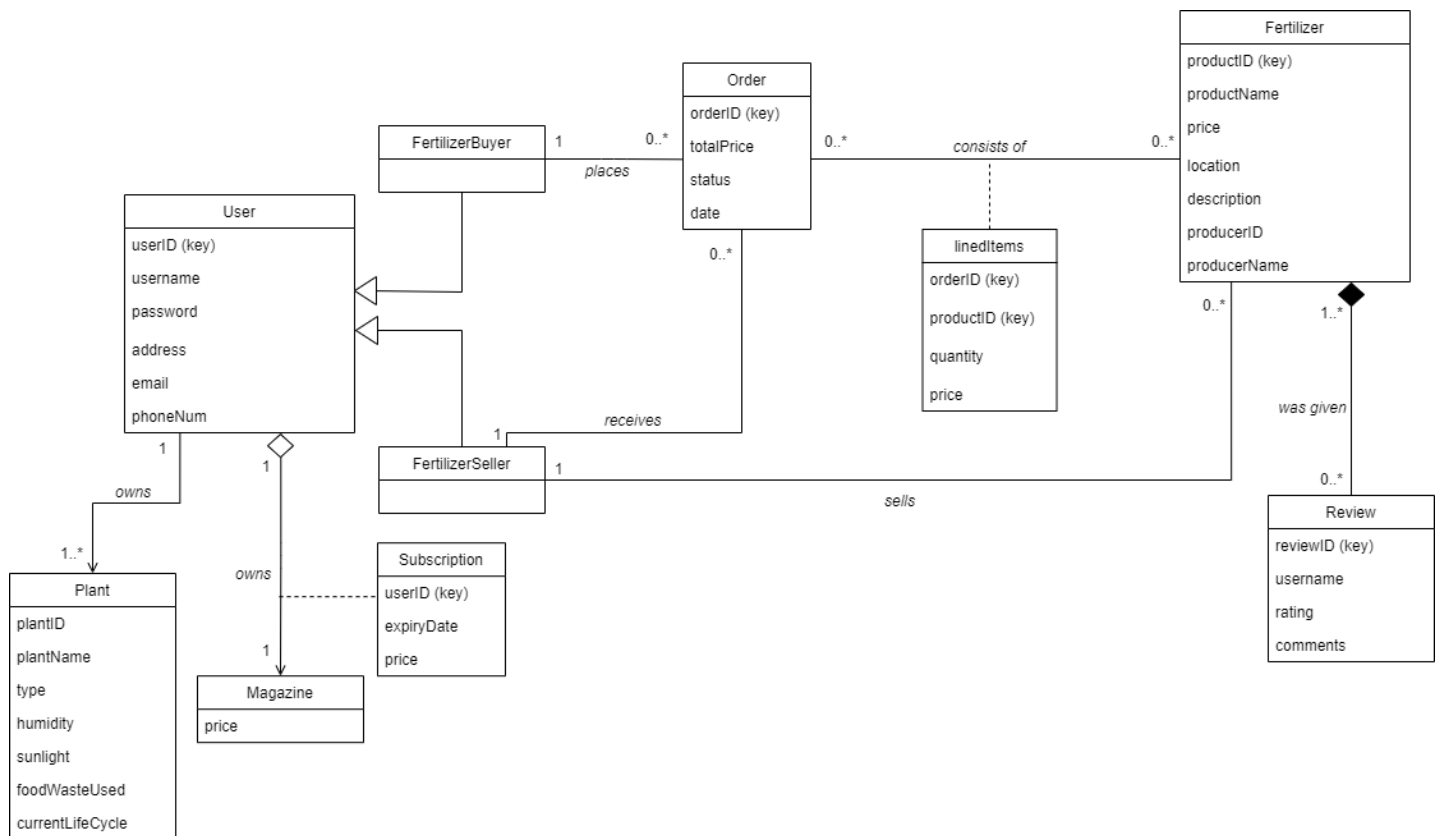
Fertilizer Buying Activity Process



3. SYSTEMS SEQUENCE DIAGRAM



4. DOMAIN MODEL CLASS DIAGRAM



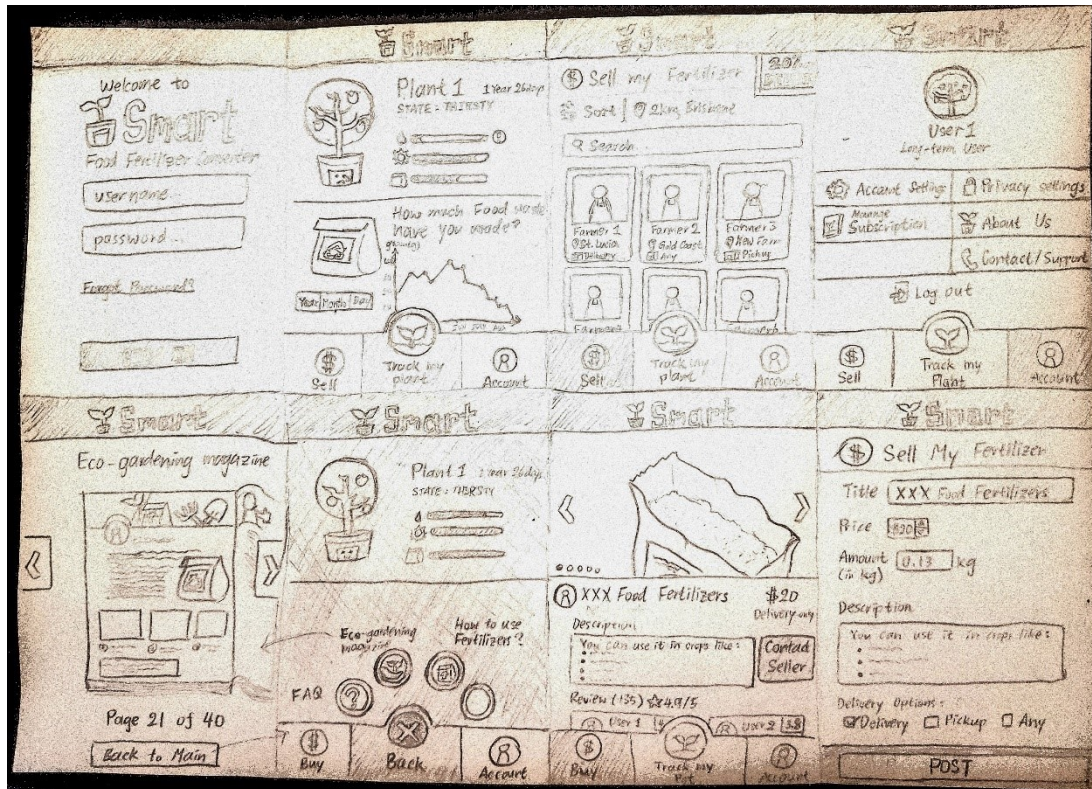
5. PROTOTYPE LOGIN DETAILS

No login details needed, just enter the first page of the prototype by clicking this link:

<https://xd.adobe.com/view/380cef9b-fbe4-4880-50a0-cb059ef36559-4e3d/>

6. USER INTERFACE AND DESIGN STORYBOARD

Full Storyboard

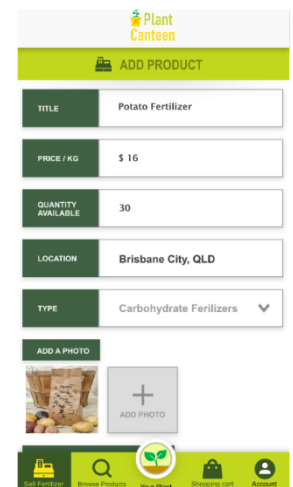
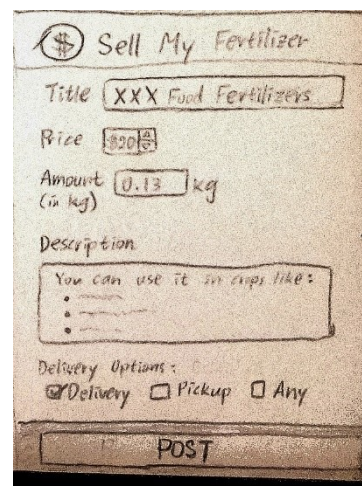
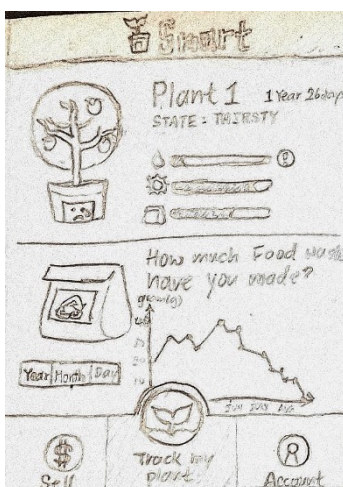


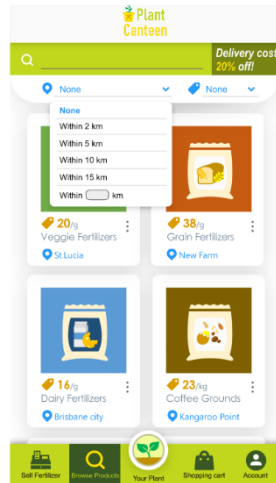
Track Your Plant page:

- User can check the status, sun exposure, humidity and amount of food fertilizer
- The food fertilizer is also used to track user's yearly, monthly and weekly food waste habit.
- The seed on the screen will grow into a tree as time passes
- User can switch plants by clicking on the pot (not tested in this prototype)
- "Your Food Waste Statistics" label is added based on feedback

Sell Fertilizer Page:

- User can create new product for the food fertilizers they are selling
- They can include photos, types of nutrients and quantity available
- After this there will be another page for them to check the product and customer's order details (will explain in later pages)



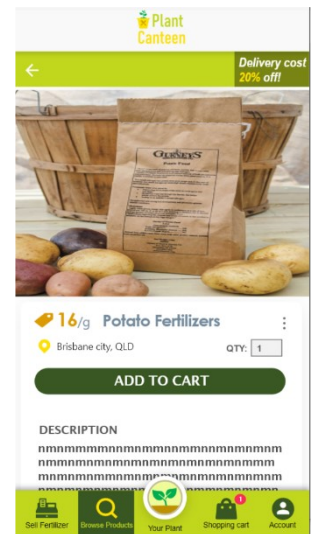


Browse Page:

- User can filter the search results by keyword, location range and price range
- The weekly discounts will be shown on the top right of the screen (but from feedback a new page may be created just for promotion and discounts)
- The “...” button near each product is used to include more features like “Browse other products from this seller” or “View Seller Details”

Product Details Page:

- User can swipe through photos of the product.
- Below the “ADD” button (in feedback changed to “ADD TO CART”) is the description and the reviews of the product
- There will also be a “Related Product” section at the bottom of the page to personalize user’s user experience

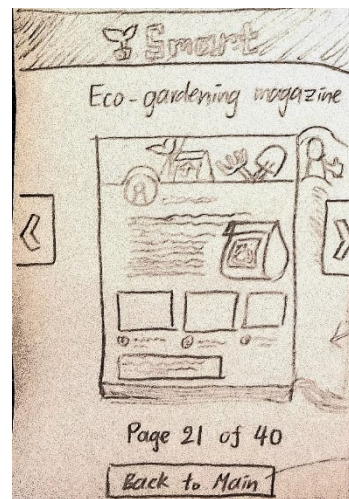
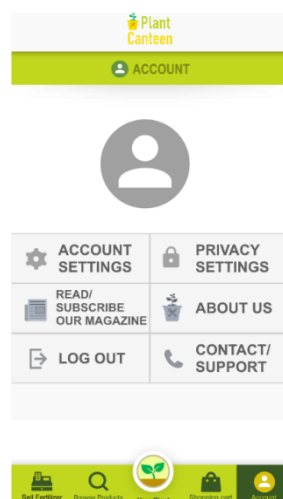
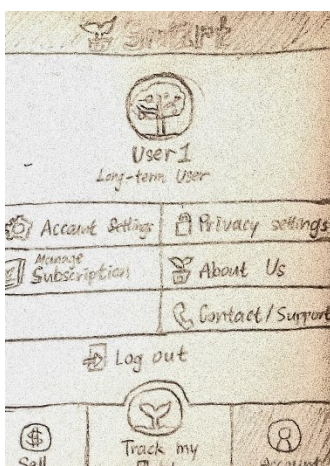


Accounts Page:

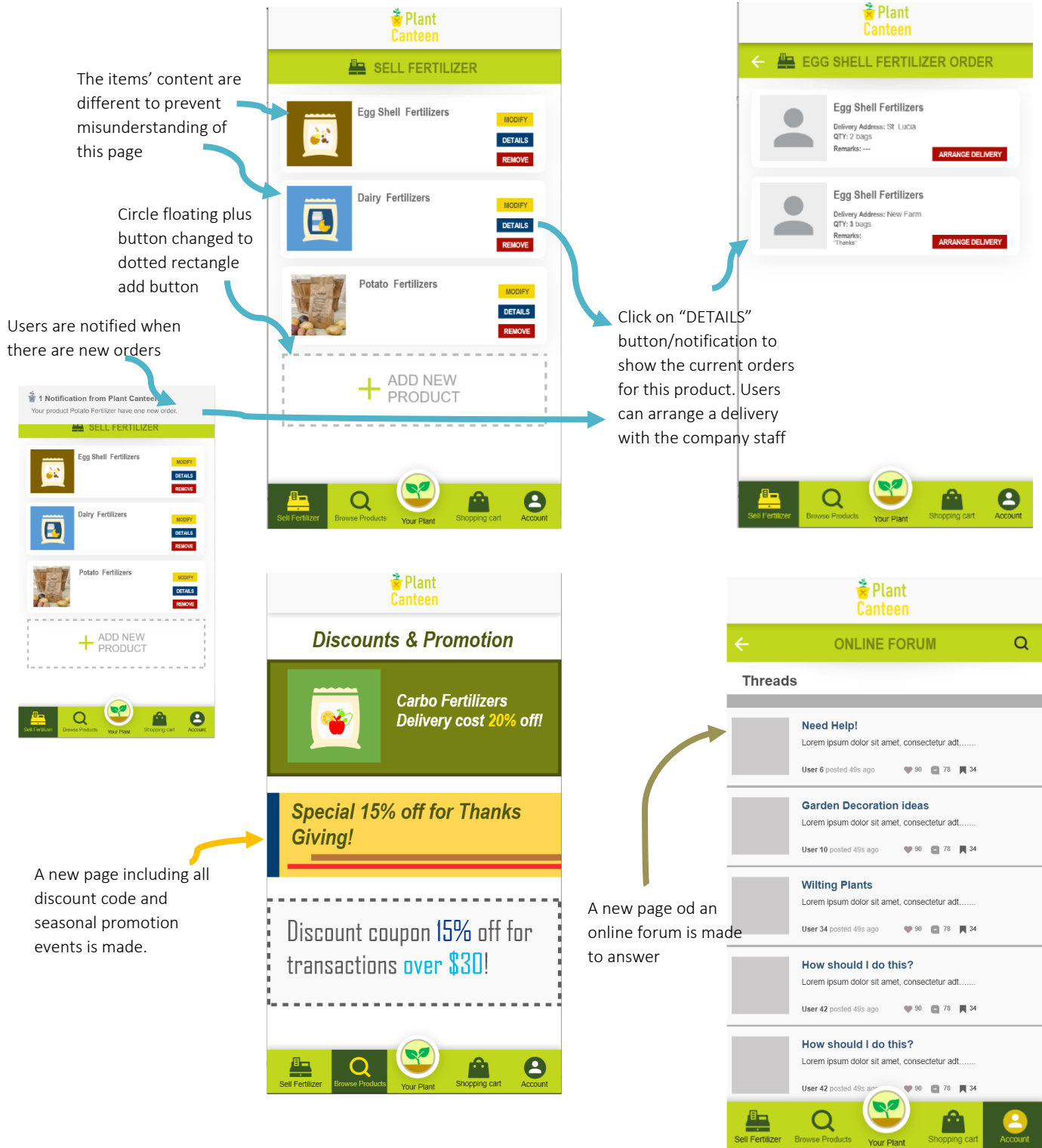
- User can change password and recover app’s data in this page
- User can read/subscribe the company’s magazine in this page (this feature is not vital so isn’t part of the navigation bar)
- User can get staff to help with IT issue here

Read/Subscribe Magazine Page:

- User have to pay \$5 to subscribe monthly to the magazine (after user testing, the magazine becomes free, but is still sold in the market)
- The content will likely be ideas of reusing household items to decorate your garden and how to plant seasonal crops.



PAGES ADDED/MODIFIED BASED ON USER TESTING



7. USER FEEDBACK

Prototype


Link/ Login details for prototype

<https://xd.adobe.com/view/380cef9b-fbe4-4880-50a0-cb059ef36559-4e3d/>

Ensure that this works, or the prototype will not be marked.

Feedback:

The table may be substituted with signed consent forms as long as they contain the information. If you are doing remote testing, please attach an email from your user, as I understand that the signature would be difficult.

	Person's name printed	Role	Contact (mobile/email address)	Signature/email attachment
User 1	SARAH	Housewife who takes in interest in domestic gardening	sarah.chan.hkg@gmail.com	
User 2	ALICE	A university student who is moving into a new apartment and is looking for a job.	yikyanc@student.unimelb.edu.au	AliceEA.msg
User 3	CYRUS	A student who passed the DECO2500 HCI course	cyruscyruscc33@gmail.com	CyrusEA.msg
User 4	SIMON	A 3 rd year UX/UI student	eg25ud@gmail.com	SimonEA.msg
User 5	LINCOLIN	A 2 nd year Management student	lincolnsj18@gmail.com	LincolnEA.msg

Interview questions and rationale

Rationale

Plant Canteen Pot is a plant pot that can turn food waste into food fertilizers and use it in your plant to grow food at home.

It can be used with the Plant Canteen Pot mobile app. This app allows you to track the plant's status, track the amount of fertilizer you used and sell the extra fertilizers to farmers in need. In addition, this app has an eco-gardening magazine where you can subscribe monthly to look for tip to tend your garden. Comparing to dumping food waste into food waste bin, this mobile app can facilitate the logistics of crop-fertilizer as an C2C platform. When people are encouraged to recycle their food waste, crop fertilizers can be mass produced, and lower the financial cost of fertilizers for farmers.

Prototype

Please proceed with the following link to the prototype:

<https://xd.adobe.com/view/380cef9b-fbe4-4880-50a0-cb059ef36559-4e3d/>

Questions

Task 1

- 1.1 Login
- 1.2 Add a plant
- 1.3 Find the status of the plant
- 1.4 Find the amount of food fertilizer produced this month

Q1: Did you make any mistakes in this task? (e.g. mistaking a button as something else?)

Task 2: Sell extra fertilizer

- Q2 Do you find this page easy to navigate?
- Q3 What do you think about the display of order status in this page?

Task 3: Find products 2km around you

- Q4 Is the distance, price and keyword filter enough?

Task 4

- 4.1 Find the product "Potato Fertilizer"
- 4.2 Find the reviews of this product
- 4.3 Add this item to your shopping cart
- 4.4 Find the recommended products

Q5 From a scale of 1-5 (very counter-intuitive to very intuitive), how do you rate the User Interface of this page?

Task 5

- 5.1 Find the eco-gardening magazine
- 5.2 Subscribe to the magazine
- 5.3 Read through the first few pages of the magazine

Q6 What do you think if incorporating this eco-gardening magazine into this app? (e.g. is it excessive)

Q7 From a scale of 1-5 (Very likely - Not at all), how likely will you subscribe to this magazine?

This is the end of user testing thank you for your participation

Feedback Report

Overall, the feedback from users gains my insights on the design of user interface, as well as possible alternative channels in attracting customers. All doubts in UI design have been answered using the questions asked during the test.

For positive comments, the majority of the users think the app's bottom navigation bar is easy to navigate, some think the graphics and design is nice and tidy. Most believed that the magazine, if added extra features (mention below), could help beginners to learn how to plant.

For negative comments, in Task 1 most think the "Update Data" button text should be modified to "Add Plant and Update app Data" or something like "I'm Ready!". Some also opined that the button should be more visible since they can't find or understand it.

Most users got stuck in Task 2 Sell Fertilizers, since they are confused about where the add new product button is, which is not clearly shown ("+" button). It is important to note that some users are not native mobile users (e.g. Sarah), and thus may not be familiar with the common UI presentation of an "+" floating button. Instead, she suggested replacing the button with a dotted box labelled "Add new Product" at the end of the list.

Another major negative opinion is the display of the order status in the same task. Most have questions about making the status more detailed and able to display the details of multiple orders instead of just a line of text of "xxx orders delivered". For this, should be replaced by a button labelled "Details", and it will link the user to a new page, where the orders of your product will be listed, from the latest to the earliest, each is given a status. Alice gave a good point that the app could push notification when users' product is ordered.

For "Task 3 Find products 2km around you", many think the current filters ("Within x km", "Price Range" and keyword search) are enough to search for products, whereas one added that the delivery cost should also be displayed on each product.

For Task 4 Product Details Page, the UI scores an average of 4 out of 5, which is excellent, though one (Simon) opined that the "Add" button should be changed to "Add to Cart" just to be clearer. Sarah said the "More" button is not necessary, but the button makes users navigate easier in a smaller mobile screen so it would not be changed.

In Task 5 Reading eco-gardening magazine comes many constructive feedbacks. Some suggests adding more details to what the content of the magazine is about before asking "Will you subscribe to this magazine", since users will most likely subscribe depending on the attractiveness of the contents. For example, ideas of decorating garden by reusing things could be a popular content to be included. Whereas others are discouraged by the price of the magazine when asked whether they would subscribe. Lincoln said perhaps let the users to have a preview of few pages of the magazine so that they know whether it worth \$5 to subscribe monthly.

In addition, there are other suggestions made on the features of the app during the testing. One recommended including an online forum in the app to answer beginners'

doubts in gardening and how to use the app. While some proposed making a new page about the latest discount code/coupons instead of just a small box saying “Delivery cost discount” in the Browse page. It is a good idea since the page could also be used as a seasonal/festive promotion, incorporating the idea of “Have special events/discounts during season change/festivals” mentioned in user story map by adding more colourful graphics and details of the special events in this page.

Answers to Sprint Questions

1) Do users know how, why and what food waste can be used as fertilizers?

Yes. One of the users Cyrus said they can always learn these online, whereas Sarah advised that the app could include a forum for beginners to get instant response for their doubts. It engages customers by helping each other. Others believed that the company’s magazine could help beginners learning how to use food fertilizers.

2) Can this product retain customers in long term?

The app’s magazine feature can retain customers in long term, but some features discovered in users testing results could be a better method than magazine. The forum which Sarah proposed will be a good way to retain customer by building a stronger community. Other than that, celebrating season change and annual festivals by having special discounts and events in the forum could be an opportunity to approach the community and gain their momentum. This should be noted in Customer Relationships of the Business Model Canvas.

3) Can users gain awareness on eco-friendly in long term?

All users think it promote the eco-friendly image of the company, however not all users will subscribe to the magazine due to the pricing.

Lincoln suggested that the monthly magazine could provide a trial or preview so users can have a look at what the content is like, and Alice opined that the price discourage younger users to subscribe to it. Considering this, the magazine could be free of charge when user by this product, but other readers will still need money to buy magazines. The magazine therefore could be extended as a new channel in Business Model Canvas to gain potential customer segments awareness of this product.

8. USER FEEDBACK FORMS FOR EACH USER

Feedbacks

Key: [N] = Negative [P] = Positive [O] = Others

Sarah's Feedback

Task 1: Login & Plant Tracking page

[N] For Task 1.2 Add Plant, “maybe make the button’s colour more visible or change the button text to “I have added my plant”

[P] “I like the graphics, layout and animation of the page, they’re so cute!”

Task 2: Sell Fertilizer Page (hesitate for a while before clicking)

[P] “The navigation of this page is easy and clean overall”

[N] “The + floating button is better replaced by a dotted rectangle under the boxes saying “+ Add product”, you know I am quite an old person who don’t know how these mobile button’s work.”

[N] “For the Order status display, maybe it’s just the prototype’s problem, please don’t make all boxes ‘Potato Fertilizer’, I thought they are all history of the same transaction.”

[O] “You could also consider a tutorial or instruction manual of how to use this app, so customers know what it does and how it works.”

Task 3: Browse Page

[N] “Show delivery cost for each product, either in this page or the Product Details page, don’t left it until users go to the shopping cart”

[P] “The filters are fine, no need to add more.”

Task 4: Product Details Page & Shopping Cart Page

[N] “Again, show delivery cost on this page so customers can see the total cost straight away.”

[P] “I will rate the navigation 4 out of 5 since the description, recommend and review section are nice and clean.”

Task 5: Read/Subscribe Magazine Page

[P] “The magazine is not at all excessive, some wants to learn about gardening. Perhaps you can make a forum instead of a magazine if your intention is to help gardening beginners, as the help user get from forums will be better addressed and more instant.”

[O] “4 out of 5. I will subscribe it (magazine) only if the content is attractive. For the content about interviewing expert, well... it should be the LEAST important thing in the magazine. Most gardening hobbyists like me love magazines with photographs of how to decorate their backyard gardens, and how to plant food for each season. It’d totally be worth subscribing for \$5 if it has all these. Oh, you could also include how to reuse things to decorate.”

Alice's Feedback

Task 1: Login & Plant Tracking page

- [N] Made a mistake as she's not sure whether she have added a plant or not, and navigated to other pages
- [P] "Easy to find status of the plant and amount of fertilizer, maybe can provide total / average number of the time period."
- [O] "If I touch other points on the graph, will it show the statistics of that point?" (Answer: Yes)

Task 2: Sell Fertilizer Page

- [P] "The navigation of this page is easy"
- [P] "The display is neat and tidy."
- [N] "The Words with different colour (grey for no order, yellow for delivering...) helps users to see new notification of the order."
- [N] "The font size and button size can be larger."

Task 3: Browse Page

- [P] The filters are enough, no other comments.

Task 4: Product Details Page & Shopping Cart Page

- [P] 4 out of 5 for the layout. Review and description of the product can be separated in two parts. Reviews can be viewed without clicking 'More' button

Task 5: Read/Subscribe Magazine Page

- [P] It's ok to have this magazine as it's related, and new users are possibly interested it
- [N] only 2 out of 5 will I subscribe it (magazine), as it's not free.

Cyrus's Feedback

Task 1: Login & Plant Tracking page

- [N] After logging in, took me a while to figure out how to add a plant.

Task 2: Sell Fertilizer Page

- [P] The navigation of this page is easy. I just have to click the + sign.
- [O] What if we have both reviews and orders?

Task 3: Browse Page

- [N] Should let users search based on the location as well, not just within X km.
- [O] "If I made a new product, will it be shown in the Browse page?" (Answer: yes)

Task 4: Product Details Page & Shopping Cart Page

- [P] 4 out of 5 for the layout. "The word "ADD" isn't that intuitive if users don't have a sense that there is a shopping cart. Perhaps add a tiny icon beside it or something."

Task 5: Read/Subscribe Magazine Page

- [P] I'm not sure whether it (the magazine) is excessive, but the magazine is pretty intuitive that it is under Account.
- [N] 2 out of 5. Too many free information online.

Lincoln's Feedback

Task 1: Login & Plant Tracking page

[P] No mistakes made, the login was very smooth, probably it will be good to put "add a plant" function on the home page too. Otherwise, everything was well thought of.

Task 2: Sell Fertilizer Page

[P] The page is easy to use and I'm able to add a new product easy by just keying in a few simple details and adding a photo.

[N] The order status is very difficult to see

Task 3: Browse Page

[N] It would help to add a product type function.

[P] The rest of the function available are indeed very useful filters for the users.

Task 4: Product Details Page & Shopping Cart Page

[N] I will rate the interface 3.5 out of 5. I think that the interface could be more interactive

[P] Overall the design and layout simple yet detailed and informative.

Task 5: Read/Subscribe Magazine Page

[P] I think it is a good idea to have it in the app as it can educate users on eco-gardening and to be more environmentally conscious.

[O] I will rate 3 out of 5 for the likeliness to subscribe to this magazine, I feel giving user the options to have a trial period to view the magazine will attract more users to subscribe to the magazine. Also making the magazine like a monthly magazine will be a big plus too.

Simon's Feedback

Task 1: Login & Plant Tracking page

[P] For 1.4, no mistakes were made in this task

[N] The amount of food fertilizer is not clearly shown in the application as I couldn't tell the graph is indicating that. It would be better if it shows description above the graph.

Task 2: Sell Fertilizer Page

[P] Yes pretty much, it's easy to locate the function keys.

[P] It is shown in a concise way, which is good.

Task 3: Browse Page

[P] The distance is enough to find it straight away.

Task 4: Product Details Page & Shopping Cart Page

[O] 4, if there's a star rating for each review that would be better, so that users can be easier to navigate the reviews (good or bad) they want.

Task 5: Read/Subscribe Magazine Page

[N] It is a bit excessive, as it is put in the "account" section where it is not related to account, and the eco-gardening magazine section doesn't seem to fit in other sections.

[N] "2 out of 5 will I subscribe to this magazine, I am not sure is inside, perhaps a preview of the magazine?"