



NM4259 Mobile Interaction Design

Passion Produce

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Initial Design Proposal

Research

Introduction

As part of the Singapore Green Plan 2030, the Singapore Food Agency (SFA) unveiled a set of 30 by 30 goals, which revolves around building Singapore's agri-food industry's capability and capacity to sustainably produce 30% of the country's nutritional needs by 2030 (30 By 30, n.d.).

However, there has been much challenge in achieving this target, with many urban farms facing numerous setbacks in recent years. Considering the importance of Singapore being able to achieve food security, I believe that more than be done to improve our overall consumption of domestic produce.

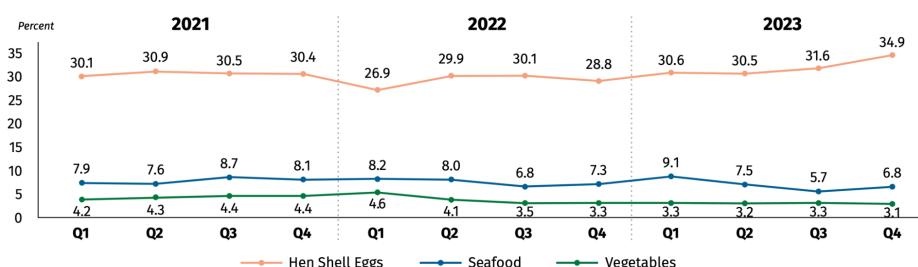
Research

In order to better understand the challenges urban farms are facing, I delved into further research of the problem. In particular, I found 2 sets of data that provided a good understanding of the problem at hand. The first being the Singapore Food Statistics 2023 by the SFA and the second being a survey conducted by Yougov on the sentiments of residents towards local produce.

Singapore Food Statistics 2023

The Singapore Food Statistics 2023 looks into developments of Singapore's food security and safety situation in 2023. For this proposal I will only be focussing on Chapter 2: Strengthening Singapore's Food Resiliency: Local Production.

Figure 2.1: Local Production as a Percentage of Total Food Consumption

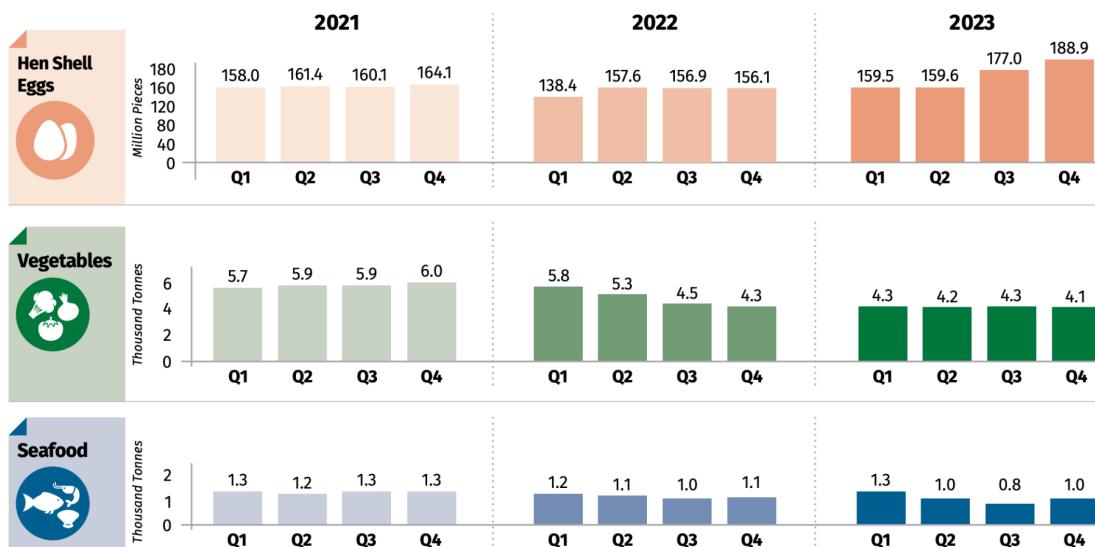


Note: Statistics for local production of seafood include only live and chilled forms. Statistics for local production of vegetables include fresh and chilled forms.

Figure 1: Local production as a percentage of total food consumption

To better visualise the current consumption patterns of residents, Figure 1 demonstrates that the Hen Shell Eggs industry is the only one to achieve the 30% consumption target set out by 30 by 30. In particular, there is a significant lack of consumption of locally grown seafood (6.8%) and vegetables (3.1%). Considering this, for the purpose of this proposal, I will be placing greater focus on the local seafood and vegetable industries in order to raise their local consumption levels to meet the goals set out by 30 by 30.

Figure 2.2: Local Production



Note: Statistics for local production of seafood include only live and chilled forms. Statistics for local production of vegetables include fresh and chilled forms.

Figure 2: Local production from each industry from 2021 to 2023

Figure 2 highlights the supply of local produce from each industry. Focussing on the vegetable and seafood industries, we can see that since 2022, there has been no significant growth in production from either industry. This lack of growth in production is an indicator that there is a similar lack of profitability in both industries that prevents them from expanding operations.

One reason for the lack of growth in the industry concerns its inability to profit off operations. In recent years, many urban farms such as I.F.F.I and Sky Greens have closed

or scaled down its operations (Tan, 2024). This reduction can be attributed to a number of such farms being unable to turn a profit or raise new funds for operations, a problem further exacerbated by rising operational costs (C. Tan, 2024).

The lack of ability to turn a profit, however, appears to be due to a lack of demand for local produce. This is highlighted by the excess stock produced by urban farms who are unable to sell, who then turn to donating or throwing out their produce in order to maintain operations (Lee, 2023). In fact, the problem of excess stock is seemingly increasing as producers like SG Veg Farm, whose harvests can go up to 500 kg of produce, have seen its volume of leftovers increase by about 40% over the past few months (Lee, 2023).

Indeed, considering the above data, it can be seen that whilst there is enough supply to produce higher local consumption levels, the lack of demand from the local market, neither allows for this number to be achieved, nor for the industry to grow.

YouGov Surveys

Considering the lack of demand to be a key factor behind the industries' lack of growth, it thus becomes important for us to understand the rationale behind the lack of consumption of these products. To better understand this, I turned to an online survey conducted by YouGov. This survey saw the responses of 842 local residents who grocery shop at least once a month, on their local produce consumption patterns.

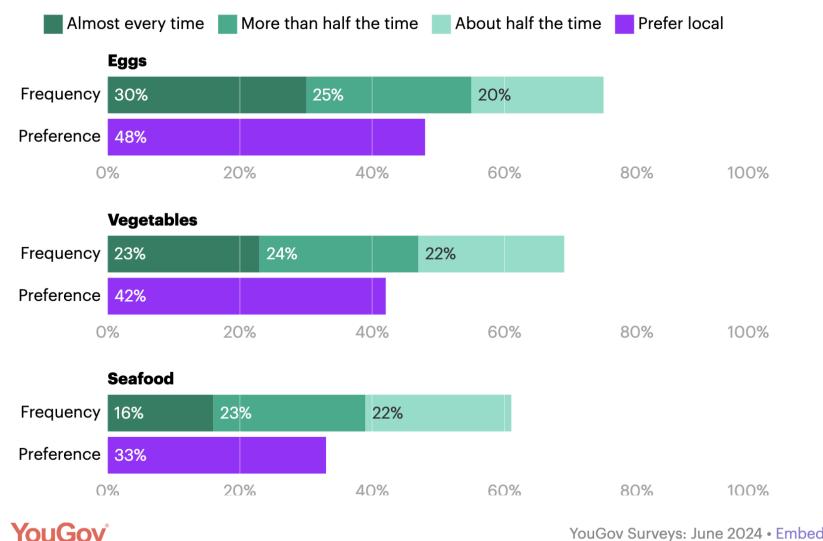
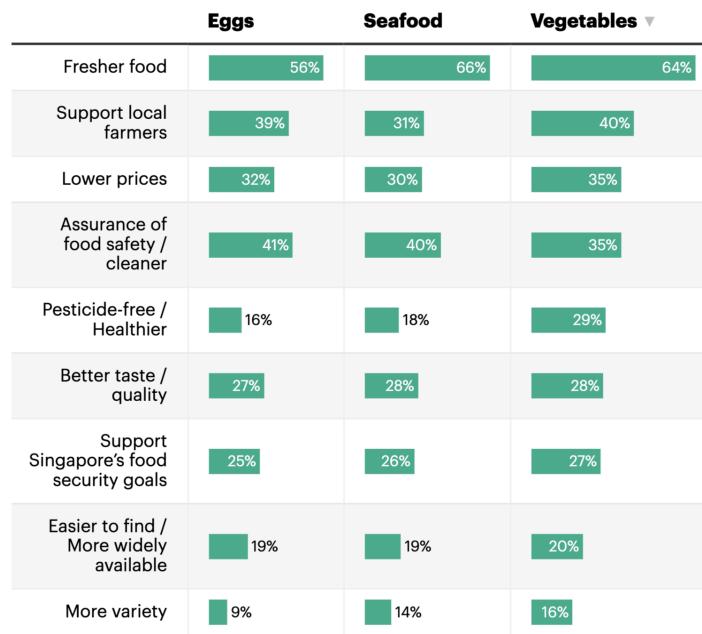


Figure 3: Frequency vs Preference: Buying locally sourced produce in Singapore

Taking a closer look into Figure 3 which details the preferences of respondents, despite the relatively high (>30%) inclination towards purchasing local produce, only about half of those respondents purchased local produce every time. This highlights that despite there being favour for local produce, there is a significant lack of action in purchasing.



YouGov

YouGov Surveys: June 2024 • [Embed](#)

Figure 4: Top reasons why consumers in Singapore prefer to buy local produce

According to Figure 4, the greatest reasons respondents favoured local produce over imports across all 3 food groups, include: Being able to eat fresher food, assurance of hygiene standards and wanting to support local farmers.

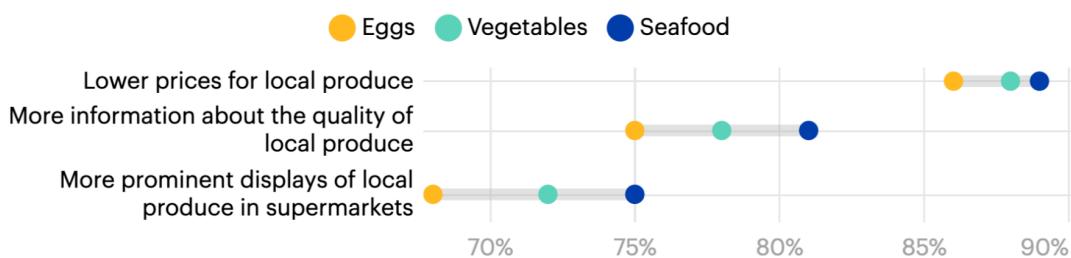
	Eggs ▼	Seafood	Vegetables
Lower prices	68%	33%	46%
Better taste / quality	35%	48%	43%
Fresher food	29%	41%	30%
Easier to find / More widely available	18%	30%	49%
More variety	18%	41%	41%
Assurance of food safety / cleaner	9%	21%	16%
Pesticide-free / Healthier	9%	16%	16%

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Figure 5: Top reasons why consumers in Singapore prefer to buy imported produce

Figure 5 highlights the reasons respondents preferred imported produce, where for seafood better taste/quality, fresher food and a greater variety were its top 3 reasons for preference. Meanwhile, convenience stood at the top factor (49%) for consumers preferring imported vegetables as consumers pointed towards their wider availability ahead of other factors such as lower pricing and better taste/quality.



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Figure 6: Likelihood of encouraging consumers who don't currently prefer local produce to buy more

In Figure 6, when respondents were asked what could persuade them to buy local produce over imports, over 8 in 10 cited that they would do so upon seeing lower prices.

The next most cited reasons included seeing more information about the quality of local produce and more prominent displays of local produce in supermarkets

Considering the survey results from YouGov, we can see that there is clear room to increase demand for local produce. Solutions to promote this demand can utilise the survey data collated, including targeting competitive pricing for local produce, increasing marketing of products and increasing its visibility.

Design Problem

Taking into consideration both data sets, we can see that one of the key factors behind the lack of ability for Singapore to reach a 30% local food production capability concerns the lack of demand for local produce, which thereby prevents the growth of the industry. Considering this, we must find a solution to raise the demand for local produce within residents in Singapore. Our first goal therefore looks at:

1. How might we persuade more local residents to consume local produce (specifically, seafood and vegetables)

Considering the factors that might influence consumers to increase their consumption, the following statements should also be taken into consideration when designing a solution:

1. How might we allow the pricing of local produce to appear competitive to imports?
2. How might we further highlight the high standards of quality that local produce possesses?
3. How might we enhance the visibility of local produce to consumers when they are grocery shopping?

Proposed Solution

Considering the above design problems, I propose the creation of a marketplace web app for Singapore residents. This web app would act as an online grocery platform selling products from urban farms in Singapore for local residents. For the purpose of this proposal, I will be designing this platform to be optimised for mobile phones.

One of the key reasons why I chose for the solution to be situated on a web app instead of a native mobile application concerns the ease of access. Native mobile apps often need to be downloaded on one's device, taking up storage space, which many users have a limited supply of. Considering this, situating the solution on a web app allows more users to access it as all users require is a browser, which comes pre-installed on most mobile devices. As such, in order to minimise the barrier to entry for the application, I have found that hosting the platform on a web app is optimal.

The target users for this app would be local residents of Singapore who are comfortable with purchasing groceries online. This user group would largely comprise of youth and adults, who are characterised by their receptiveness towards purchasing goods online and the ease at which they navigate digital platforms.

Considering that the YouGov survey was based on a wide demographic of responses, there is no indication towards a specific age group or subset of residents that would be most receptive to achieving the goal of enhanced consumption. As such I have based my proposed solution on an equally broad user group, focusing on their digital literacy as the key element of distinction. In doing so, the app would be able to receive a wide target audience, ideally allowing for a distinct increase in demand for local produce.

This app would have the following key features:

1. An online marketplace that allows residents to purchase produce from urban farmers in Singapore. Residents would then be able to have their purchases delivered or for them to pick up in person.
 - a. The app would also have a feature that highlights price comparisons between local produce and imports that are similar in price
2. The app also allows users to learn more about the farms they buy from, including information about events, safety standards imposed to ensure quality produced and assurance of freshness.

Considering that there is currently no convenient consolidated source for purchasing local produce, by introducing an app that allows users to purchase from any urban farm in Singapore, this would provide local produce much greater visibility within the local market.

Additionally, by allowing users to purchase online across a variety of urban farms, they would be allowed greater convenience and access to a wider variety of produce. This is

especially so for vegetables which in the YouGov survey highlighted that a lack of variety was a key factor in consumers not consuming local produce. As such, by increasing the variety of locally produced vegetables available, there is a higher likelihood of local produce suiting the needs of consumers, and therefore allowing them to compete with imports in the local market.

As an online platform, urban farms would be able to save on the costs of renting a space in supermarkets. This reduction in operation costs would open the opportunity of being able to lower prices of their goods sold towards consumers on the site. Whilst this reduction in price might be marginal, this would allow prices to appear more competitive towards consumers. Therefore, by introducing a feature that allows side by side comparisons of local produce that are similar or lower in price with certain imports sold in supermarkets, users would feel more inclined to purchase local produce over imports.

Furthermore, by allowing users to learn more about the urban farms at which they purchase from, users would be educated on the high standards of quality at which products are produced. This allows greater assurance for local produce and thus more preference towards its safety and quality, ideally, this would result in an increased demand for local produce.

User Interview

To determine the usefulness of the proposed app and its features in increasing demand for local produce, I have undertaken an interview with 2 members of the target user group. These 2 interviewees were chosen based on their differing purchasing behaviour and rationale in order to ensure that multiple perspectives were considered when testing for usefulness.

The format of the interview conducted took on a semi-structured form with 2 key sections, firstly an introduction to learn more about their purchasing patterns, followed by a desirability test for the proposed solution.

Introduction

To begin the interview, I enquired both interviewees, A and B, on their experience utilising online platforms to purchase groceries, focusing on their frequency of use, and their purchasing patterns. Additionally, I enquired both interviewees on their general purchasing patterns on both imports and local produce.

Interviewee	Demographic Details	Purchasing Patterns
A	Age: 32 years old Female Lives with her spouse and child	<ul style="list-style-type: none"> • Buys groceries online at least once a month on the NTUC mobile app • Tries to purchase local produce which she believes to be “cleaner”, but only if the prices are similar to imports. She considers the slightly higher price (relative to imports) to be a premium for better quality produce • Has only experiences purchasing locally produced eggs and vegetables • Is unaware of locally produced seafood
B	Age: 25 years old Female Lives with her parents	<ul style="list-style-type: none"> • Buys online groceries at least twice a month on the NTUC mobile app • Usually makes purchases based on what is cheapest (which happens to be imports) • Has only experiences purchasing locally produced eggs and vegetables • Is unaware of locally produced seafood

Usefulness Test

I then proceeded to conduct a usability test on the proposed solution and its features. During this process, I enquired with the interviewees their feelings and perceptions towards each feature.

Some of the key findings from the interview are as follows:

Whilst both interviewees found the app interesting, both noted that the app being a separate platform from their usual supermarket platform was inconvenient.

A noted that this app would be useful for her when purchasing specialty goods. She gave the example of how the quail farm she usually buys from is limited to in-person purchasing or purchase by phone. As such having a consolidated app to purchase other goods alongside her quails would be convenient. B felt that the app resembled a farmers market, which would be useful for her to explore the different locally produced products available.

However, both A and B noted that they are still likely to turn towards their usual supermarket platform when grocery shopping as they usually purchase other things eg. home supplies, in the process. As such they felt that it would be most convenient if this platform could be integrated with their supermarket platform.

Whilst both interviewees felt that being able to see price comparisons between products on the app and imported goods was useful, it would not motivate their decision to purchase unless they already had the intention of doing so.

Both A and B felt that unless they were already making a purchase on the site, they would not deliberately purchase a local product just because it was cheaper. This is especially so if this product could be bought in supermarkets as they prioritise the convenience of being able to order everything they need at once.

Both interviewees felt that a consolidated platform providing more information about urban farms and their events would be useful

A noted that she tries to expose her child to farms in Singapore, but struggles to find information about them, especially in relation to whether they are open to the public. As such a platform for her to gather information would be useful. B noted that such a platform would make learning about urban farms in Singapore more accessible. She felt that if she were able to learn more about these farms, she would better be able to identify them in supermarkets, and is more likely to buy from them. Additionally she noted that seeing pictures of these farms would make her feel more assured of the cleanliness of the produce.

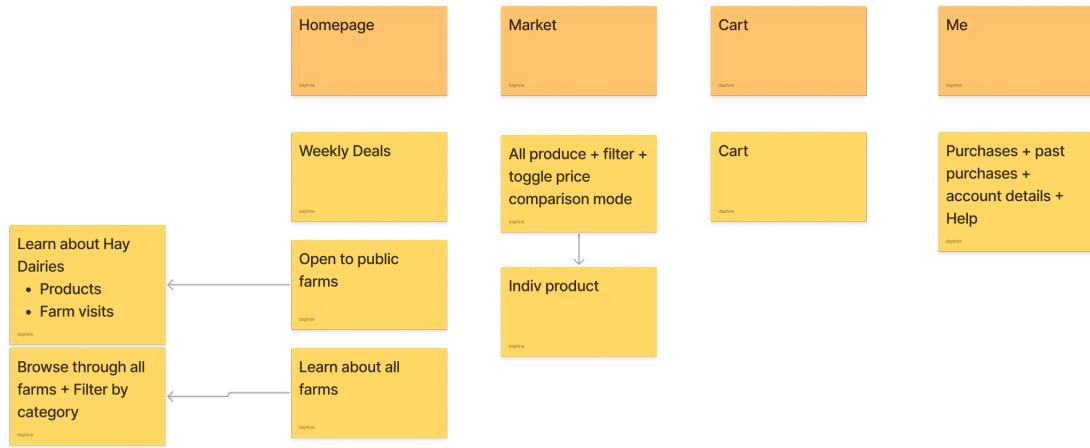
Based on the user interviews, we can conclude that whilst there is desirability for the web app, the platform would be most useful for those who existingly make direct purchases from farms in Singapore eg. quail farms.

However, the app would still be useful as a platform of education. In fact, there is high potential that through the marketing of urban farms and the education provided, that local produce becomes much more visible within the domestic market. With greater visibility and knowledge of these farms, residents are more likely to identify these local produce not just within the app, but also in physical supermarkets, thereby increasing demand.

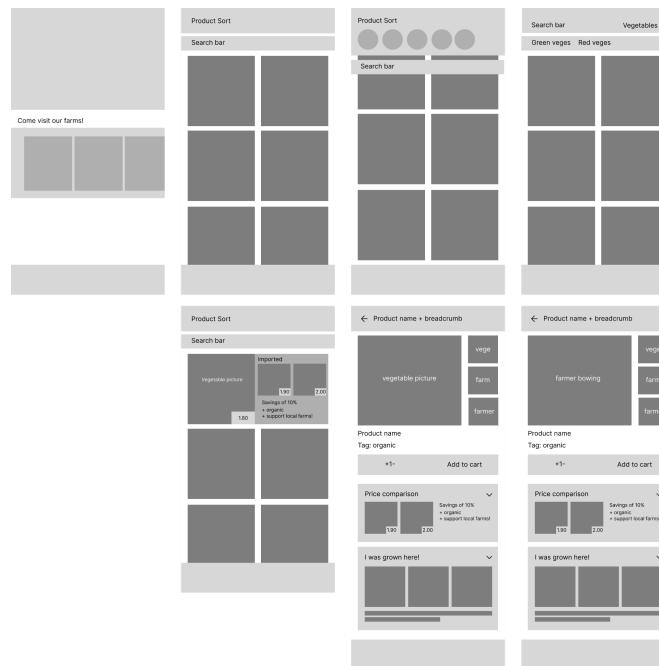
Digital Wireframes

Based on the data gathered from research and user interviews, I proceeded to create a series of digital wireframes for the key features of what I envisioned for the web app.

To prepare for this, I created a rough outline of the information architecture of features I wanted to put into this app.



I then proceeded to Figma to create the digital wireframes, mainly focusing on the flow of a user discovering and checking out a product from the app.



Mid Fidelity Proposal

Introduction

In order to ensure that my proposed solution was usable and useful in achieving the goals set out for it, I engaged in testing to learn more about how users interacted with my proposed web app.

To do so, I conducted user testing for which I engaged in a Qualitative Usability Testing which included a section on A/B testing with 3 interviewees. All 3 interviewees were students between the ages of 22 -25, and were proficient in utilising mobile devices. The testing was moderated and conducted remotely on Zoom.

The general flow of testing is as follows:

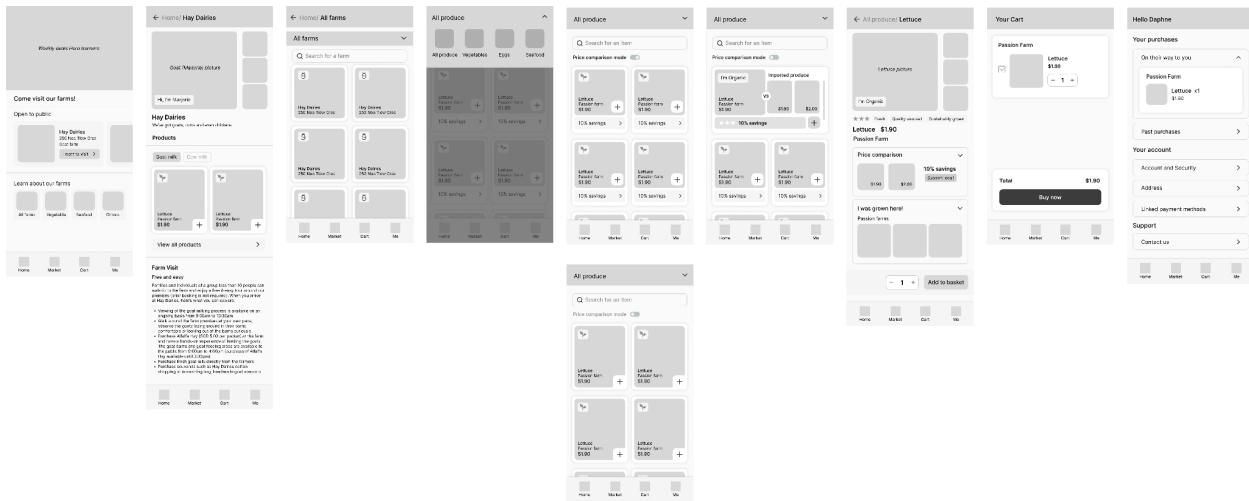
- **Introduction**
 - Provided users with notice of informed consent
 - Provided a background explanation of the app, including
 - *Purpose and aim of the app*
 - Acting as a consolidated online marketplace for local farmers to sell their goods to local residents
 - Aims to increase domestic consumption and thus demand for local produce
 - This is achieved in 2 ways
 - 1. Increasing visibility of local produce through a dedicated app
 - 2. Increasing education on local farms, so as to encourage a personal connection of residents with farms
 - *Key target user group involved*
 - Local residents of Singapore who are comfortable with purchasing groceries online
 - Inclusive of a wide age group, by largely targeting youths to adults
 - **Task 1: Purchase 1 Lettuce using the app**
 - Homescreen
 - A/B Testing of product card in Market page

- Flow 1: Market page, Expanded Product Card, Product Information Page
- Flow 2: Market page, Product information page
 - Cart
 - Me
- **Task 2: Assume you are a parent wanting to bring their child to a farm in Singapore, find a suitable farm to bring your child to**
 - Homescreen
 - Hay Dairies product page
 - Explore all farms

Considering that the navigation of screens was determined by the actions of the user, the aforementioned screens might not be in the same order as those taken by users.

Low Fidelity Designs

As I wanted users to be able to understand the app and the representation of its various components, I created a series of low fidelity designs for the user testing. Considering that the user testing was focussed on only the aforementioned 2 tasks. I decided to create low fidelity designs only for the screens that would be used in testing.



User Testing

Usability Test

For this test, I requested that users take on a think-aloud protocol. Users would verbalise what they saw on the page and any feelings or comments they might have on it. From

there, users would inform me of what they might do in order to complete the task, and I would navigate the different screens for them in the process.

Task 1: Purchase 1 Lettuce using the app

Homescreen

Goal: Testing for whether users understand the homepage + usefulness of what is currently displayed

Hero Banner

- All 3 users were able to identify that the banner would consist of advertisements for farms and would provide links to information on these farms

Exploring Farms: Open to Public and Learn more about our farms sections

- 1 user was unable to determine the difference between both sections
 - User was confused as he was unable to tell what made a farm “open to public” and what didn’t. He noted “Why are not all farms open to the public, what makes farms that aren’t, not openable?”
 - Assumed that if the section above is open to public, the section below would be farms not open to public
- The 2 other users were able to identify the differences between both sections: open to public farms and every farm in Singapore
 - Open to public farm
 - Both users expected that when they clicked in, to see events that the public can attend as well as more information on visits such as opening hours
 - 1 user questioned about the sequence at which cards were displayed to her, such as whether it would be by relative distance or relevance
 - Learn more about our farms
 - Both users expected more information about how crops are produced, what the farms sell and what they can buy

Conclusion

From these key insights we are able to conclude that the Hero Banner and Exploring farm section of the homepage was largely usable for users, and they were able to navigate through the components well. However, more clarification needs to be done on terminology used. Considering this, we may conclude that the homepage was useful in allowing users to be linked to other sources of information.

Market

Goal: Testing for usability + desirability of price comparison feature

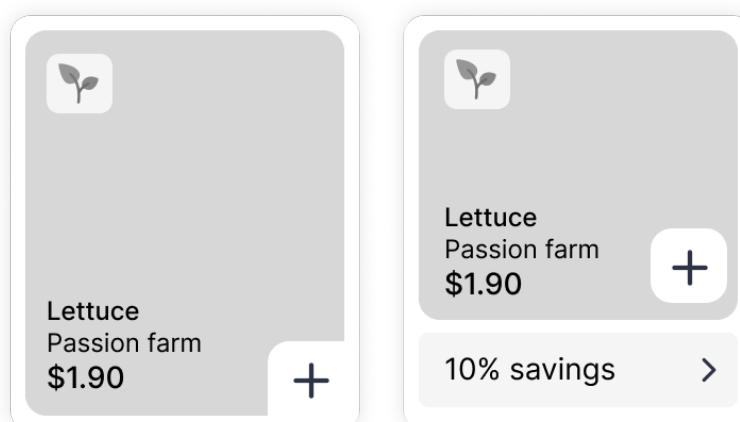
For this screen, I undertook A/B testing between 2 types of product cards and therefore flows for the product card.

A/B Testing (Within subjects)

Goal: To test the usability and desirability of the price comparison mode

In this portion of the testing, I wanted to see how users felt towards the price comparison feature integrated into the product cards. In particular, I wanted to find out whether users:

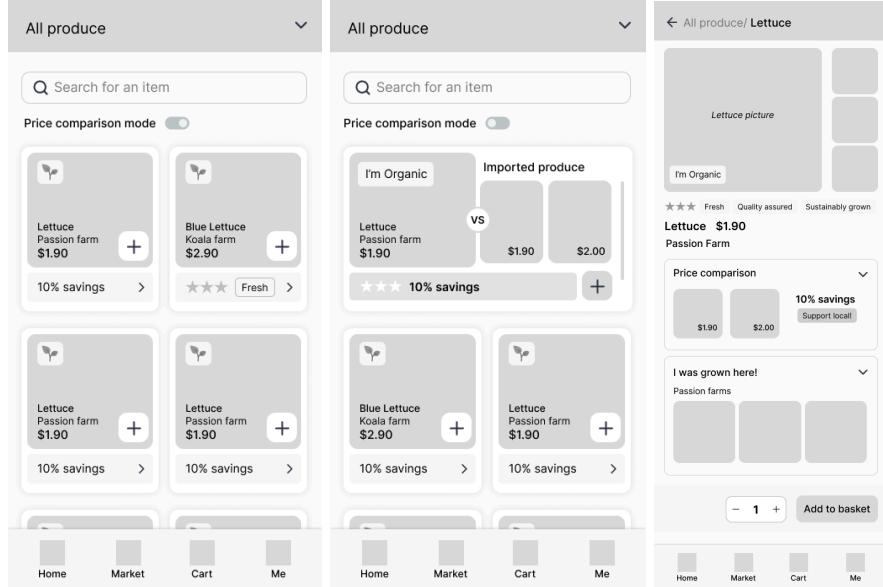
1. Users were able to understand that they were able to save 10% from buying this product in comparison to imported goods
2. Users found this useful
3. Users would be motivated to purchase this local product



Left: Price comparison mode off; Right: Price comparison mode on

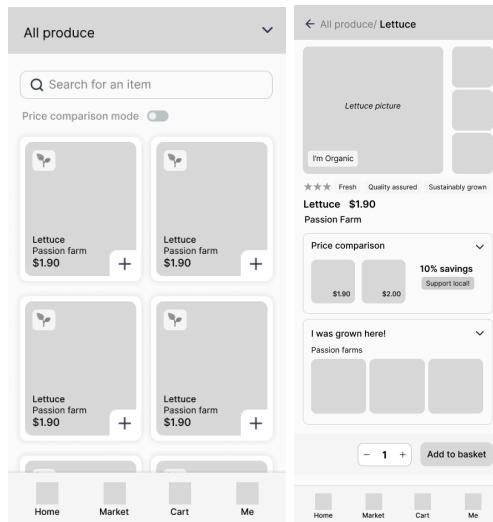
To test this, I engaged the user in 2 flows. Initially I would put them through flow 1, where I would gather their opinions and understandings of the page on display, as well as what they expected when they clicked on certain components.

Flow 1: Price comparison Mode



The product card would be expanded when 10% savings is clicked on

Flow 2: Price comparison mode off



Then I would bring in the Market screen with the price comparison mode toggled off. I would ask users to tell me what they felt changed about this screen. I once again engage them on their thoughts on the page, and what they expected when they clicked on certain elements.

Key insights

Navigation

- All 3 users were able to navigate to the market screen through the tab on the nav bar
- 1 user initially clicked on the all farms button (under learn more about our farms), however was able to redirect herself to the market button in the nav bar. She noted that this was due to this button being more prominent than Market on the nav bar

Flow 1

Product Card

- All 3 users were unable to understand at first glance the meaning of 10% savings
 - All 3 user thought that the 10% savings referred to coupons or the idea of a deal
 - All 3 users thought that when clicking into the 10% savings bar, they would be brought to a terms and conditions page, or to claim a voucher
- All 3 users did not know what stars referred to
 - 1 user thought it was representative of the discount offered whilst another felt that it was related to reviews
- All 3 users felt that the leaf icon on the card referred to the fact that the product was a vegetable (although this was meant to represent its organic status)

Product Card (Expanded)

- 1/3 users were able to understand the comparison being made between the local product and the imported produce

- 1 user understood that the 10% saving was in comparison to the other 2 at the side, and that this local product is thus 10% cheaper.
- 1 user felt that the 10% savings was in comparison to market rate, or the use of a deal or coupon
- 1 user was able to recognise that the local product was being compared to 2 other listings, but did not understand the concept of imported produce as a consumer
 - “Is it worse or better?”
- 2/3 users mentioned that in the comparison feature, they were more likely to compare by the image presented rather than price
 - Both mentioned that the image presented would highlight the product of better quality

Product Info page

- All 3 users liked the pictures presented
 - 2 users mentioned that they would utilise the pictures to judge whether they would purchase a product
- All 3 users mentioned the tags presented and liked them
- All 3 users noticed the price comparison function
 - 2/3 users noted liking the price comparison function here as it allowed them to compare for the cheaper product
- All 3 users expressed a great liking for the “I was grown here” section
 - 1 user noted that she would be more incentivised to buy from a nice farm as she would want to contribute to the farmer
 - 1 user noted that images of the farm and the crop production allows for a transparent supply chain and would motivate her to purchase the product
- 2/3 users noted that the price comparison section would better motivate them to purchase the product than the information on the farm
 - This was because both users felt that price was a big factor in their choice to purchase the product

- However both noted that the part on farm info was also a great motivator for them to make the purchase, and might skew their decisions at times

Flow 2

Overall

- Only 1 user noticed the price comparison mode being toggled off
- 2/3 users noted preference for Flow 1 as they liked the price comparison feature
 - 1 user noted that she appreciates when more information is given to her (in this case the price comparison)
- The 1 user favoured Flow 2 as
 - He would only utilise the app to purchase if his goal were to support a local farm, and in doing so he already expects to be paying a greater premium for the product
 - As such, for him the price comparison feature is not motivating, and he would instead rather focus on learning more about the farms

Navigation

- All 3 users were able to click on “add to cart button”
 - All 3 expected an animation to show the product being added to cart and to remain on the current page

Cart

Goal: Testing for sufficient information provided + usability

Key insights

- All 3 users found the page to be of what they expect from a cart page
 - 1 user remarked the lack of a delete button for cart items
 - 1 user remarked that having a recommended products section might encourage her to buy more

Navigation

- All 3 users were able to navigate to the Me page after narrating that the checkout process had occurred, and being prompted to check on their order

Me

Goal: Testing for usability + whether features are intuitive

Key insights

All 3 users found the page adequate and finding the information presented on the page to be relevant

Task 2: Assume you are a parent wanting to bring their child to a farm in Singapore, find a suitable farm to bring your child to

Homescreen

All 3 users chose to click on the Open to public card on Hay Dairies

Farm Information

Goal: Testing usability + Sufficient info + Use of pictures to encourage visiting

- All 3 users liked the pictures shown at the top
 - 2 users remarked that it was confusing to see a different picture shown on this page, than what was seen on the card
 - 1 user remarked that they found the goat picture cute
- More information needed
 - 1 user wanted to see more information about: Address, price of visiting and opening hours

Product listing

- 1 user was confused about the view all products button
 - He feels that since goat and cow milk are the only listings, why would there be more?
- 2 users were able to understand that the view all products button was in relation to the tag opened at the time

- Both expected to see all the products being sold by the farm when they clicked in
- eg. all 10 products under cow milk as well as all products under goat milk

Visiting information

- All 3 users found the information hard to read
 - 2 users were able to note that the farm was on a walk in basis, whilst the other didn't, he did not read the text at all and wondered where the booking button was
- All 3 users noted a need for the information to be more prominent and easier to digest

All Farms

As most users opted for the flow above in completing the task, I later brought them through this flow of selecting a farm through the Learn about our farm section

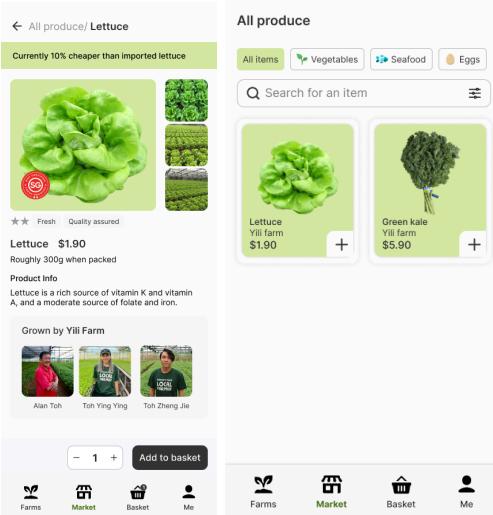
Explore farms page

- 2/3 users noted that the location does not feel very relevant
 - Both noted that as they do not know the location, the information is useless. 1 user proposed using more general locations such as East/West to represent the location instead
- All 3 users noted that the milk icon reflected the farm as one that produced milk

Changes made

For this mid-fidelity prototype, my main focus was to focus on iterating the features shown, and its layout. I also delved into including images to provide a better representation of the end product of design, and utilised 1 primary colour to highlight certain elements that I wanted the user's focus on.

Shifting main user flow to Flow 2



This flow removes the price comparison feature from product cards in the Market tab. Whilst the user testing did indicate a preference for the feature ($\frac{2}{3}$ users showed preference), it is unlikely that the happy state shown to users during the testing, would be a norm. As such, the price incentives are unlikely to be the norm.

Furthermore, motivating purchase through education and a connection to the farm that produced the product was shown in the testing to be an integral motivator for purchase as well. Considering that the users tested also noted that images played a great role in them deciding to click on the card as well, I believe that there is still sufficient motivation for users to interact with products despite the down-sizing of the price comparison feature.

With these in mind, I first modified the price comparison section, turning it into an alert that provides similar information. This alert would likely be rare to see, but appeal to those who are incentivised by price.

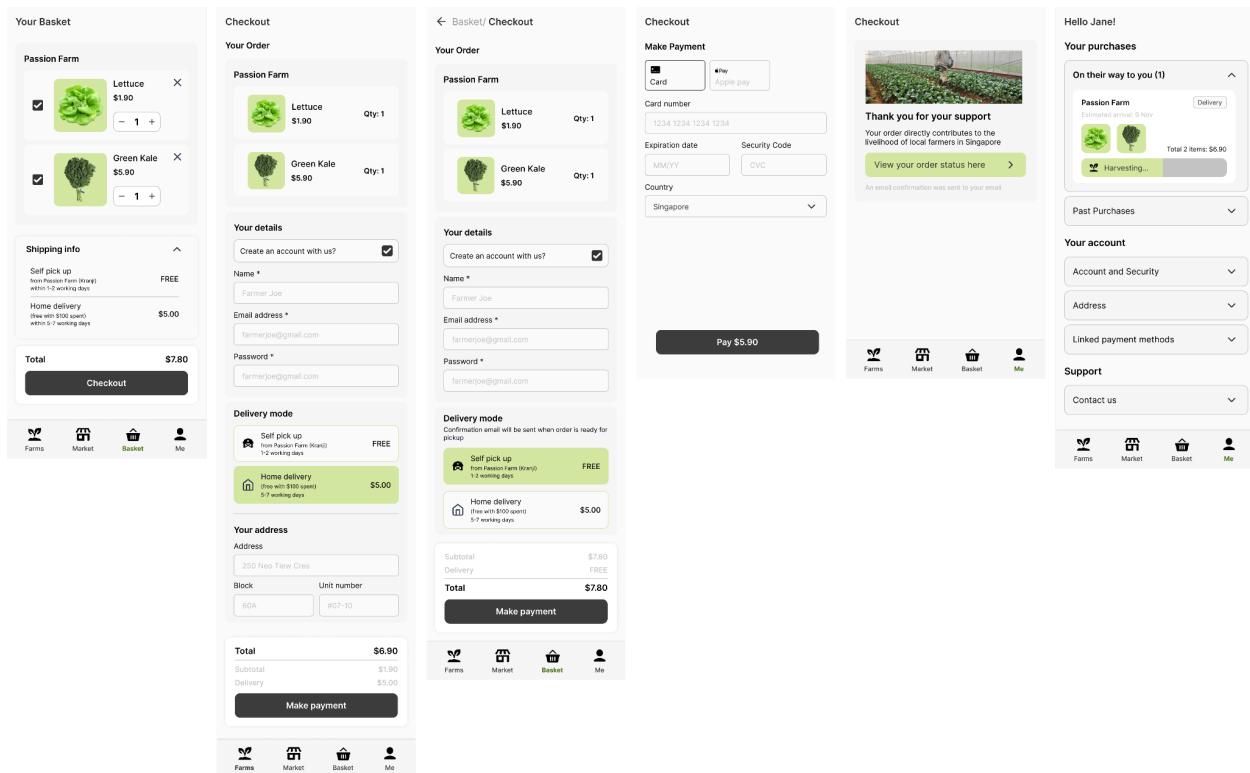
Additionally, the images of the product also include its growing environment. In this case, Yili farm provided numerous pictures of their lettuce patch, which I utilised for this screen. These pictures would assure users that the product is grown in a clean environment, giving users the assurance of quality.

I also included more information on the weight of the product, to better allow users to understand the amount they are buying

Lastly, I adapted the section on the farm. Initially this section was meant to show the growing conditions of the product, but as this was moved to the image section, I repurposed this to highlight the owners of the farm that produced the product. This allows

users to feel a personal connection to the people that grew the product they are purchasing from, allowing them to feel as though their purchase is meaningful.

Creation of checkout flow



When creating my initial wireframes, my main focus was on testing the core user task of purchasing a product, and learning more about how the features proposed would motivate users. As such, I had not included a checkout flow at that point.

For my mid-fidelity prototype, I designed the flow and screens to better highlight the delivery options available as well as for users to create an account.

For the Basket screen, I kept the layout of my initial wireframes, but added in the delete item option and provided shipping information. The delete item option is geared towards users who use the basket as a “save for later” space, and allows them to remove items they later decided against purchasing. Shipping info also allows users to better make decisions on the number of items they wish to purchase

For the checkout flow, I wanted users to be able to easily create an account from this step, therefore, I created this option and left it as the default state. I also allowed users to select their delivery mode at this point, with which the total reflected changes accordingly.

For the payment flow, I wanted users to be able to use common modes of payment such as card and apple pay. I included the relevant details needed, and as a way of confirmation as to the amount meant to be paid, I set the Call to action as the amount payable.

When the user completes the checkout flow, I wanted to once again hammer in the idea of connecting it with local farms. As such I reached out to the emotional aspect of users and characterised the Thank you screen as such. I also wanted to make it easy for users to check on their order, and included a link to the Me tab. At this point, for users who have opted for account creation, they would be able to check the status of their order.

For order tracking, I wanted the order status to be reflective of the farm theme of the app, as such, I utilised similar terminology to reflect the status. I also included relevant information such as estimated delivery.

Edits to Farm Info page (Hay Dairies)



I largely kept the same features as from my wireframes. For the images, I changed the first image displayed to be the same as that of the card shown in the Farm tab. This was

in response to a user test that highlighted a supposed change of state, with differing pictures displayed

Hay Dairies

We've got goats, cows and even chickens

Address:

250 Neo Tiew Cres, Singapore 719866

Opening hours:

Monday - Sunday
9am - 4pm

Farm visit

No Booking required

Visiting hours:

Monday - Sunday

9am - 4pm

Cost of entry:

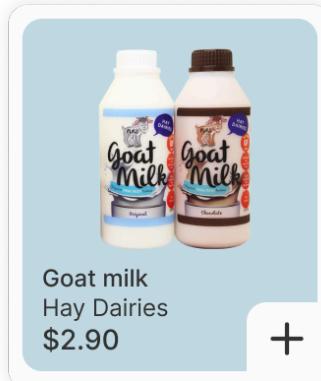
Free

What you can expect

- Viewing of the goat milking process is available on an ongoing basis from 9:00am to 10:30am
- Walk around the farm premises at your own pace, observe the goats lazing around in their barns comfortably or looking out of the barns curiously
- Purchase Alfalfa Hay (SGD 5.00 per packet) at the farm and have a hands-on experience of feeding the goats. The goat barns and goat feeding areas are available to the public from 9:00am to 4:00pm (purchase of Alfalfa Hay available until 3:00pm).
- Purchase fresh goat milk directly from the farmers
- Purchase souvenirs such as Hay Dairies cotton shopping or drawstring bag, handmade goat soap etc

I also included more information, including the address, and opening hours. For the farm visit portion, I also separated out important information such as no booking required, the visiting hours and potential cost. This would allow the user to gain critical information at first glance.

Products



View all products >

Additionally, I shifted the products section to the bottom. I wanted more focus to be on the information about farms, as well as farm visits, and as such shifted the products down the hierarchy of information. I also removed the item tags, as I wanted users to click into viewing all products instead.

Edits to Farm Info page (Yili Farms)

Whilst farms like Hay Dairies are already widely known, farms like Yili farms are not open to the public and as such less known. As such, farms like this require more help to establish visibility with residents, and encourage consumption. Considering this, the content I chose to display for farms like this differ from those like Hay Dairies

[← Farms/ Yili Farm](#)

What do the stars represent?

The callout box is divided into three sections corresponding to the star levels:

- 1 -STAR**: Local farms licensed by SFA, Singapore Fresh Produce (SGFP), TRUSTED SC-grown, FRESH Shorter time from farm to table.
- 2 -STAR**: Local farms licensed by SPA, Singapore Good Agricultural Practice (GAP) Certification, TRUSTED SC-grown, FRESH Shorter time from farm to table, QUALITY ASSURED Audited farm management practices.
- 3 -STAR**: Local farms licensed by SFA, GAP and C&G certified, Singapore Clean and Green Urban Farm (SG C&G) Certification, TRUSTED SC-grown, FRESH Shorter time from farm to table, QUALITY ASSURED Audited farm management practices, SUSTAINABLE Resource & climate resilient.

What do the stars represent? ^

Perhaps one of the most important parts I wanted to incorporate was on the certification and star labels of the product. As such, I included the different certifications possessed by the farm, as well as more information about the stars, so that users could learn more about it. Ideally, with this education, the red stickers provided would also become more visible to users in physical stores, thereby allowing them to better recognise locally produced goods.

Meet our farmers

Alan Toh Toh Ying Ying Toh Zheng Je

Yili Farm is a family-run business established in 1996 by the owner, Mr Alan Toh. Mr Toh's passion and drive towards responsible farming has enabled Yili Farm to become one of Singapore's leading local vegetable farms.

Yili is in the midst of passing the torch over to its second-generation, led by Mr Toh's daughter and son - Toh Ying Ying and Toh Zheng Je. They are continuing their father's legacy, spearheading the company towards adopting modernised vegetable growing methods and will continue to deliver the best to its customers.

Farming process

Step 1: Sowing seeds

Products

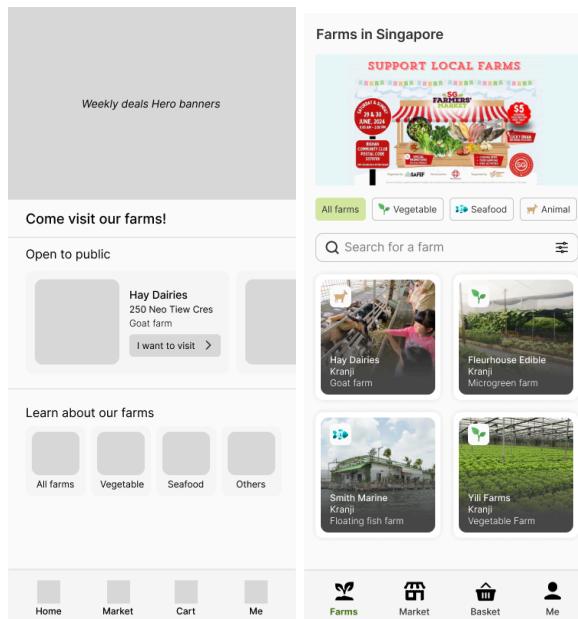
Lettuce Yili farm \$1.90 + Green kale Yili farm \$5.90 +

[View all products](#)

Farms Market Basket Me

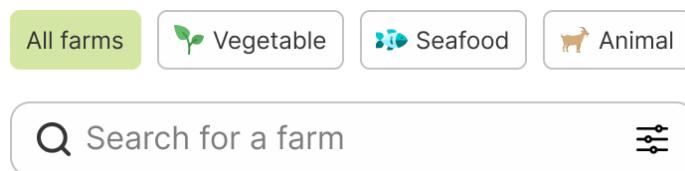
Additionally, I wanted to further create a connection between consumer and farmers, and thus added in a portion about the farmers who produce the vegetables, as well as the farming process. The introduction of both of these elements came from the user testings where users were greatly interested in knowing more about the environment their produce was grown, as well as about the people involved. In the user testing it was shown that more information about these aspects would push consumers to consume these goods.

Conversion of Home to Farms



In my initial wireframes, I had a home screen that allowed users a section on open to public farms and to learn more about all farms, which brought them to a page with individual farm cards.

From the user testing, I wanted to make changes, such that users are able to easily access information on farms. As such, I removed the homepage to become a landing page on Farms.





I also removed the sections, instead opting for users to see all the farm cards, and allowing them to sort by the 3 main types of farms, as well as providing an option to filter by elements such as Open to public.

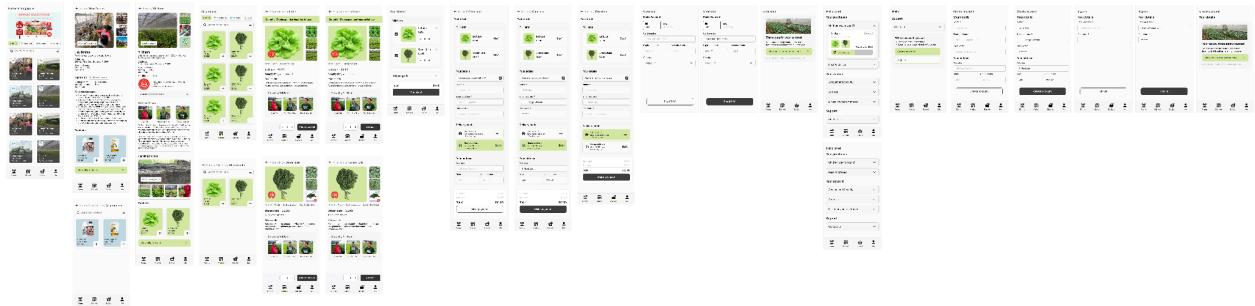


For the farm cards, I largely kept the same layout, the only change being the location. Initially, I had the location as the actual address of the farm, however that made it hard for users to understand where they were, as such, I opted to use a general location which is more commonly known, and easier for the user to visualise in relation to their location

In doing so, users are immediately greeted by the numerous farms in Singapore on entering the app, allowing them to more easily explore and access information.

Mid-Fidelity Prototype

Based on the above changes, I was able to put together a mid-fidelity prototype. This prototype ensures basic usability from the user testing, whilst also incorporating visuals such as pictures and icons to better reflect the proposed assets that would be utilised in the final version of the app. This prototype also includes the sign in and check out flow.



High Fidelity Proposal

Heuristic Evaluation

In order to ensure basic usability standards for the web app, I undertook a heuristic evaluation for my mid-fidelity prototype, with myself as the evaluator.

For this evaluation I took myself through my 2 main user tasks: Purchasing 1 lettuce, and finding information about a farm. I would first go through the flow of the task, then look back and examine each screen for any issues that go against Nielson's 10 usability heuristics.

Scale:

0 to 4, with 0 being no usability issues and 4 being a UX catastrophe

Heuristic	Severity	Why does it fail/pass, suggestion
1. Visibility of system status	1	<p>Passings</p> <ul style="list-style-type: none">• Breadcrumbs are provided when the user enters a new page• User is provided feedback when the checkout process is completed• User is informed by a progress bar on the status of their order <p>Failings</p> <ul style="list-style-type: none">• In the checkout flow, the user is unable to determine which stage of checkout they are in• More contrast can be provided in the navigation bar to allow users to see which tab they are in• Return to users the number of results have been retrieved <p>Suggestion</p> <ul style="list-style-type: none">• Provide a progress bar in the checkout flow• Increase contrast of highlighted tabs on navigation bar

		<ul style="list-style-type: none"> • Inform users of when all results have been returned
2. Match between system and the real world	0	<p>Passings</p> <ul style="list-style-type: none"> • The app uses language that is consistent with the farming process and marketplace to give the impression of farm to table. <ul style="list-style-type: none"> ◦ Eg. for nav bar, naming each tab as a part of the farm to table process: Farm, Market, Basket and Me (user)
3. User control and freedom	1	<p>Passings</p> <ul style="list-style-type: none"> • There are back buttons provided in each subpage • Navigation bar to tabs that is both accessible and visible in most screens (the exception being payment screen in order to prevent misclicks) • Users are able to remove and edit items in their basket <p>Failings</p> <ul style="list-style-type: none"> • There is no way for users to exit the payment stage of checkout, it would be better to provide an exit for users who might unintentionally find themselves there • Users should be able to undo an accidental added to cart
4. Consistency and standards	0	<p>Passings</p> <ul style="list-style-type: none"> • Terminology used for Call-to-action buttons and tabs are consistent • Actions taken by users such as clicking buttons are within expectation
5. Error prevention	0	<p>Passings</p> <ul style="list-style-type: none"> • Buttons remain inactive and thus unclickable until the user fills in the necessary fields in the checkout

		flow. This prevents the user from proceeding to the next page without inputting the relevant information
6. Recognition rather than recall	1	<p>Passings</p> <ul style="list-style-type: none"> Users are able to enter the Basket tab to see what has already been added <p>Failings</p> <ul style="list-style-type: none"> There is no affordance provided to tell users that items have already been added to their cart. Need to provide more affordance in the clickability of buttons <p>Suggestions</p> <ul style="list-style-type: none"> Provide the number of items inside the basket, as reflected on the basket tab icon
7. Flexibility and efficiency of use	0	<p>Passings</p> <ul style="list-style-type: none"> Users are able to directly add a item into their cart from the Market tab, without having to enter the product info page
8. Aesthetic and minimalist design	1	<p>Passings</p> <ul style="list-style-type: none"> Information that is supplementary to the user, such as shipping info and certifications are hidden behind a drop down so as not to overwhelm the user with information <p>Failings</p> <ul style="list-style-type: none"> Portion on farm visit expectations might appear rather lengthy with too much information

9. Help users recognise, diagnose, and recover from errors	1	<p>Failings</p> <ul style="list-style-type: none"> ● Need to make compulsory fields more pronounced (* currently blends into the page) ● Not enough feedback is provided to users about information that is missing in the checkout flow. <p>Suggestions</p> <ul style="list-style-type: none"> ● Provide diagnosis of missing fields in Call to action button
10. Help and documentation	0	<p>Passings</p> <ul style="list-style-type: none"> ● Components such as search bars and checkout fields already provide prompts into what the user should be entering in the field ● Users are able to access help by contacting the organisation in charge through the Me tab

Key Changes made

Based on the heuristic evaluation I went on to make a number of changes to the mid-fidelity prototype, as well as including colours to the prototype. For the most part, the only visual changes were made to the prototype, with all flows remaining the same.

Checkout Flow

Provided an indication to the number of steps in the checkout flow to better allow users to understand their current position in relation to the flow

Made compulsory fields more pronounced by increasing contrast of the asterisk against background

Additionally, instead of just having the inactive CTA button, provided a way for users to understand why the button is inactive, so that they might diagnose their errors. This change however, was not made to the payment screen as the core information important to users here is still the amount payable.

Lastly I provided a way for users to exit the payment stage of checkout, in the event that users choose not to follow through with the flow

The image displays two screenshots of a mobile application's checkout process. The left screenshot, titled 'Basket/Checkout' at the top, shows 'Step 1 of 2' and 'Your Order'. It lists items from 'Yili Farm': Lettuce (\$1.90) and Green Kale (\$5.90). Below this is a 'Your details' section with fields for Name, Email address, and Password, each marked with a red asterisk indicating it is required. A checkbox for 'Create an account with us?' is checked. The right screenshot, titled 'Checkout/Payment' at the top, shows 'Step 2 of 2' and 'Make Payment'. It features payment method options: 'Card' (selected) and 'Apple pay'. Below these are fields for 'Card number' (containing '1234 1234 1234 1234'), 'Expiration date' (MM/YY), 'Security Code' (CVC), and 'Country' (Singapore). At the bottom of the right screenshot is a large green button labeled 'Pay \$5.90'.

Market Tab

Created a footer such that users are informed when all results have been returned.

Additionally, provided the number of results that have been returned in a page

All produce

All items Vegetables Seafood Animal

Search for an item

30 products found

Lettuce
Yili farm
\$1.90

Green kale
Yili farm
\$5.90

Goat milk
Hay Dairies
\$2.90

Kale & Lettuce
Sustenir
\$5.95

Farm fresh eggs
Seng Choon
\$3.90

Barramundi
The Fish Farmer
\$12.90

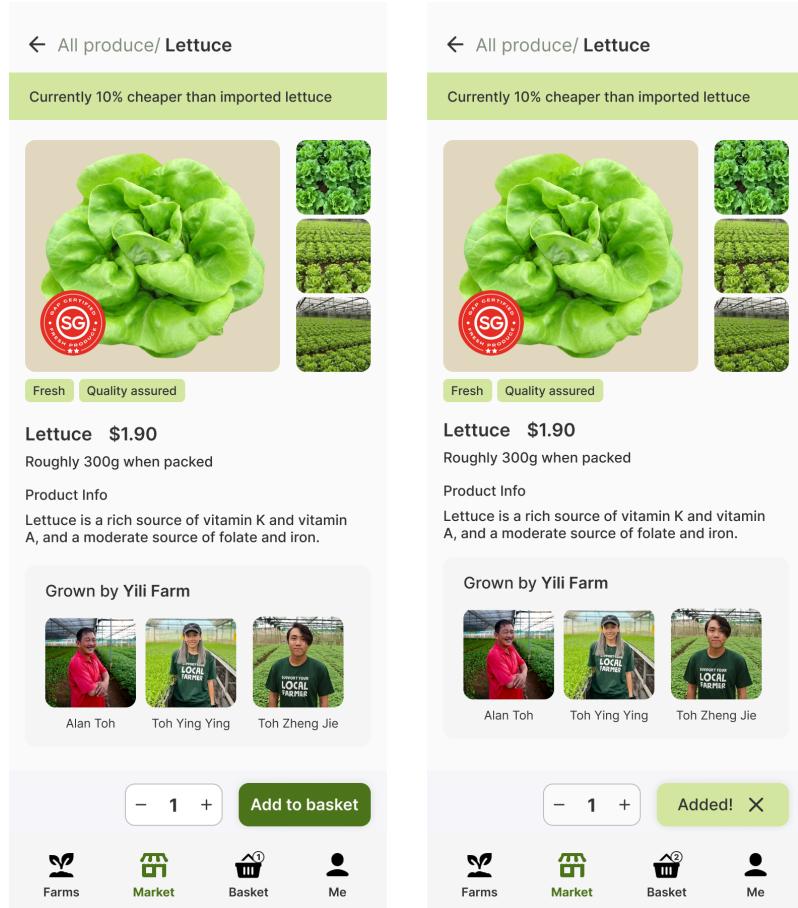
No more products
we're still growing the rest

Farms Market Basket Me

Product Info

Allowed users to undo accidental added to carts by incorporating a remove button

Included the number of items inside the basket, reflected on the basket icon whilst also increasing contrast of highlighted tabs on navigation bar

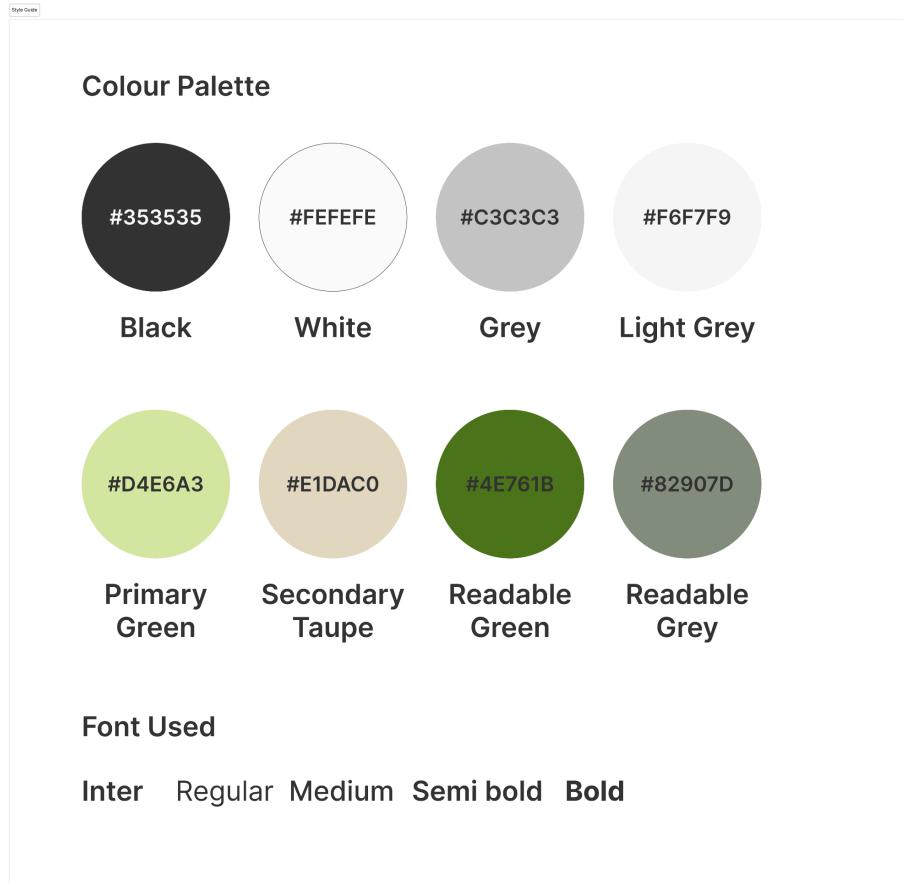


Overall Styling

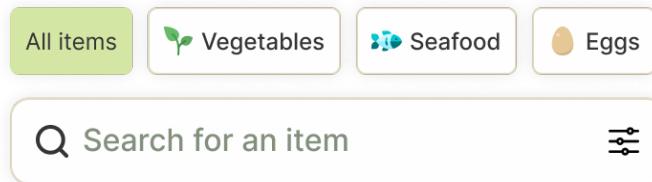
Included a consistent colour palette and font style.

The primary colours chosen of green and taupe were meant to convey the theme of Nature, with green being synonymous with leafy greens and plants, and the secondary taupe being used as a neutral colour that is synonymous with earth and soil.

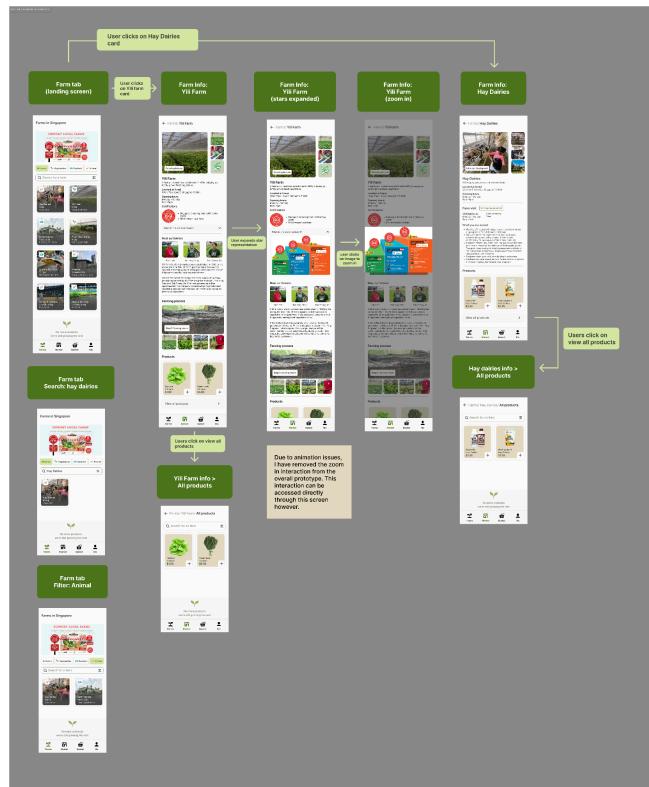
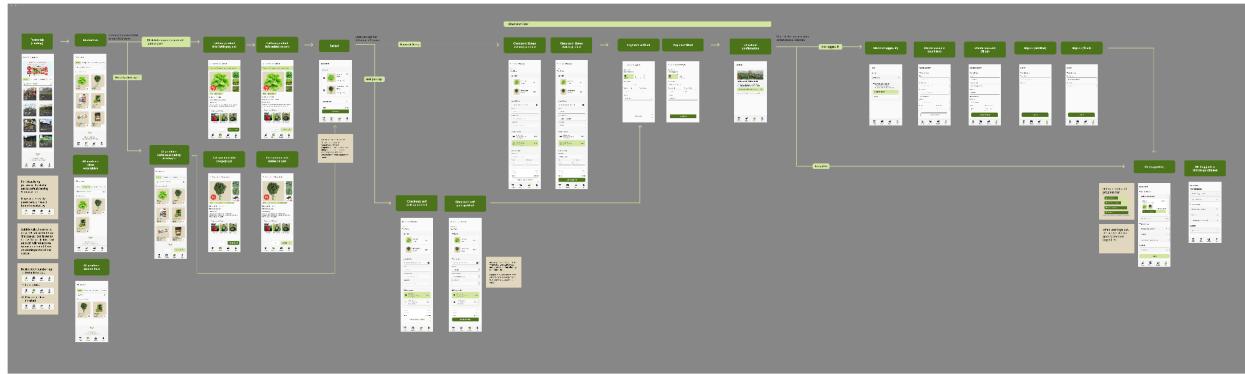
The font Inter was also chosen for its readability and numerous stylings.



Increasing affordance of clickability of buttons by including a drop shadow



High Fidelity Prototype



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