



# GREEN THUMB

Final: Responsive Web Design

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# Videos and Links



## [Link to pitch video](#)

### Final Prototypes:

[Desktop](#)

[Mobile](#)

[Watch](#)

[Tablet](#)

Please note that the prototypes are linked to follow a specific scenario. You may avoid this by using the arrow keys to navigate to each screen instead of selecting linked elements.

There is a Chrome bug where the prototypes can take forever to load. If this happens, please copy the links and open them in an incognito window. Please email Alex - [aholder2@andrew.cmu.edu](mailto:aholder2@andrew.cmu.edu) if you're having trouble viewing any prototypes.

# Team Reflection

# Talking to a service provider, we realized the connection with the next generation of gardeners was missing.



On the cold winter morning of Nov 16, we arrived at the entrance of Sestili Nursery, the first landscaping service provider that popped up in the search results. Interview scripts were written before hand, and we were hoping to gain an understanding of the business itself, the service provided, as well as the owner's view on their customers.



History of the family running Sestili Nursery



## Identifying business problems & Generating Personas

Sestili Nursery is a family business initially established by Esther Sestili. Currently, the business is owned by Ron Sestili's father, and Ron oversees the business as the main service provider.

Like many family businesses, Sestili struggles with building connections with customers from the younger generation. Ron's father has little knowledge of technology, and Ron himself is planning to approach the problem by hiring people to set up a online portfolio for their projects. The 10-people small business operates with a spontaneous working style and often without a clear schedule. While Ron didn't consider this to be a problem, most negative reviews online complains about his frequent delay and need of reminders.

With these needs in mind, we created personas for the business owner, the service provider, and spited the customers into an older groups and a young group.

# In generating 21 scenarios, we uncovered many ‘possible futures’ instead of settling for the low-hanging fruit of our initial concepts.

IXD STUDIO 1:

Iteration 2: Scenarios, Storyboards & Responsive Web Design Sketches

Start Assignment

Alex Holder, An Tang, Aradhana Venkat

SCENARIOS #1

Katie, 23, has found an appreciation for how plants can transform an indoor space. It started with succulents and now she's wanting larger potted plants. One issue she runs into is that it's hard to visualize how a large plant will look in her small 1-bedroom apartment. She's purchased plants before and had to return them after they didn't suit her vision for her apartment. While looking for nurseries in Pittsburgh, she comes across Sestili. She's delighted to find that they have an augmented reality filter that lets her see each plant in inventory in her apartment, even a giant banana tree. After seeing 5 or 6 plants, she comes across a snake plant that looks perfect next to the window by her desk. She purchases the plant online to make sure it's reserved and grabs the keys to drive to the nursery.

SCENARIOS #2

David is a 40 year old computer engineer who recently bought an apartment for his parents in Squirrel Hill Pittsburgh. He wants to get the house done up with a modern aesthetic. As a kid, he used to have a Koi pond in his house and loved playing with the fish when growing up. As a homage to their first home, David also wanted to have a Koi pond in the front porch of his new home. Being new, he didn't know much about the famous landscape designers in the area, so his neighbours shared the website of 'Landor', a boutique landscape architect whose speciality is modern aesthetics. He looked at their portfolio online and being extremely impressed by both the visual style of the website and their work itself, he scheduled an appointment online. He's extremely happy that he can finally give his parents the Koi pond they always wanted.

## Identifying user needs

With the information we gained from the interview and many online landscaping forums, we found the following customer needs:

- Visualization (of both individual plants and overall garden)
- Budgeting
- Maintenance (of both individual plants and overall garden)

As for business owners and service providers,

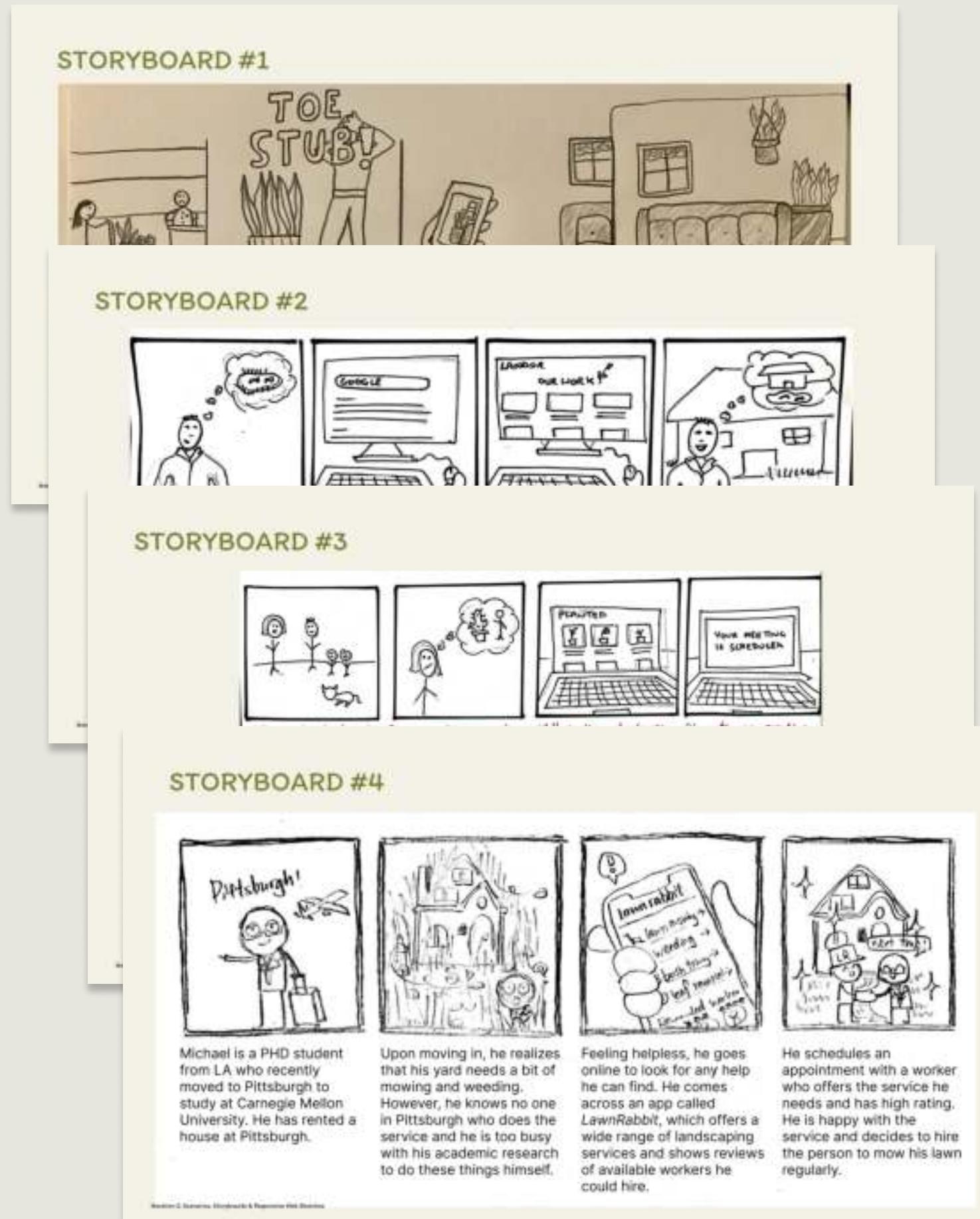
- Business management, especially with scheduling
- Communication with customers (which is very different for the older and younger generations)

## Scope expansion & Scenario generation

The frequent needs related to individual plants made us realize that indoor planting is a potential application of the product we are designing. Therefore, we decided to expand the scope of our product from landscaping to planting in general for the scenario generation stage.

With all user needs in mind, a total of 21 scenarios were generated.

# Our users saw low-fi storyboards, but we saw hi-fi reactions



## Selecting the top scenarios for storyboards

As a team, we brainstormed to identify the top 5 scenarios with the greatest potential based on their novelty and revenue generation. A story board and a lo-fi wireframe prototype were generated for each of the 5 scenarios.

## Speed Dating!

The speed dating experience provides a lot of interesting insights. As most of the speed dating were conducted in-class with our peers, we were initially worried as they might not have much experience with planting. However, it turned out the variety of expertise helped us gain diverse insights on user reactions to our proposed solutions.

## Younger customers

We first gained insights from our peers. Reactions vary with their preference in planting. Succulent lovers were excited less by visualization and more by maintenance assistance, while those with gardening experience are interested in both. Those with less experience in gardening but more insights in marketing also pointed out the potential harm of our budgeting scenario, as transparency may encourage price competition.

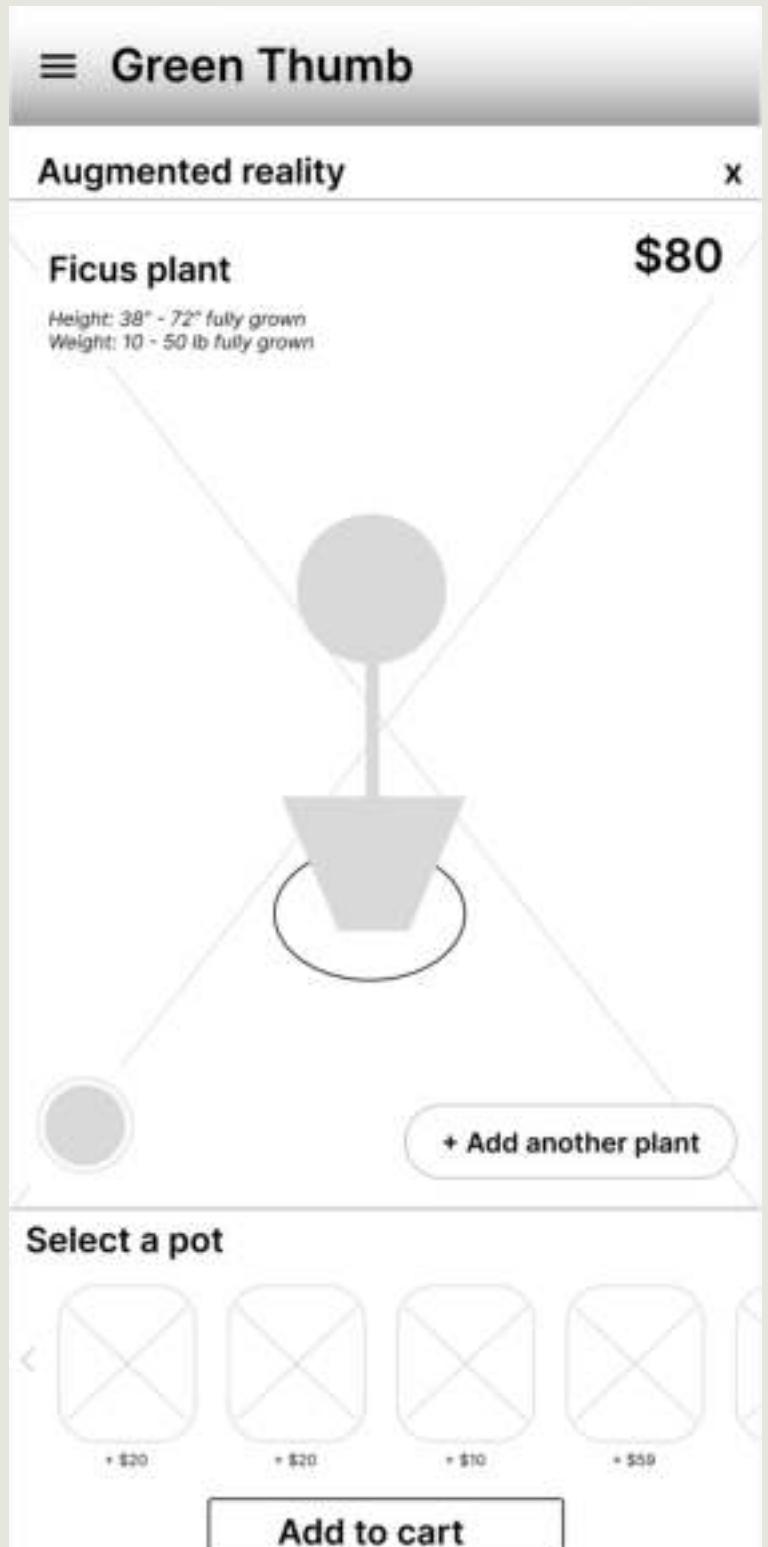
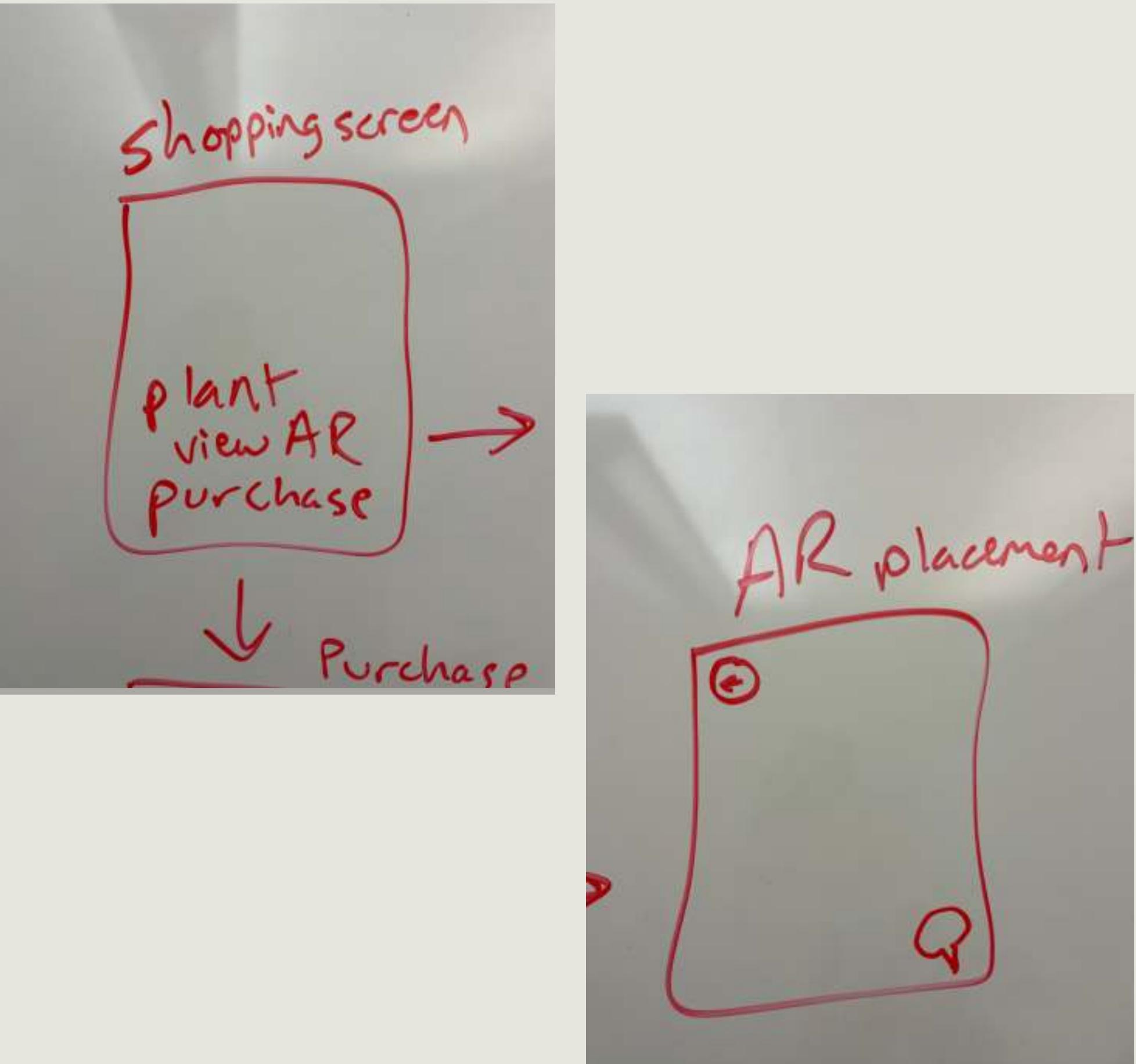
## Older customers

Outside of the classroom, we focused on gaining feedback from the older generation. They initially rejects the idea of online services, preferring *Home Depot* as they “won’t have to go back-and-forth with all the communications” and that planting consultation is the most efficient in-person. This led us to think about flow of user experience - *How should our responsive web design create smoother transition to off-line interactions?*

# Armed with this refined knowledge from our users, we had a path forward for our initial ideas.

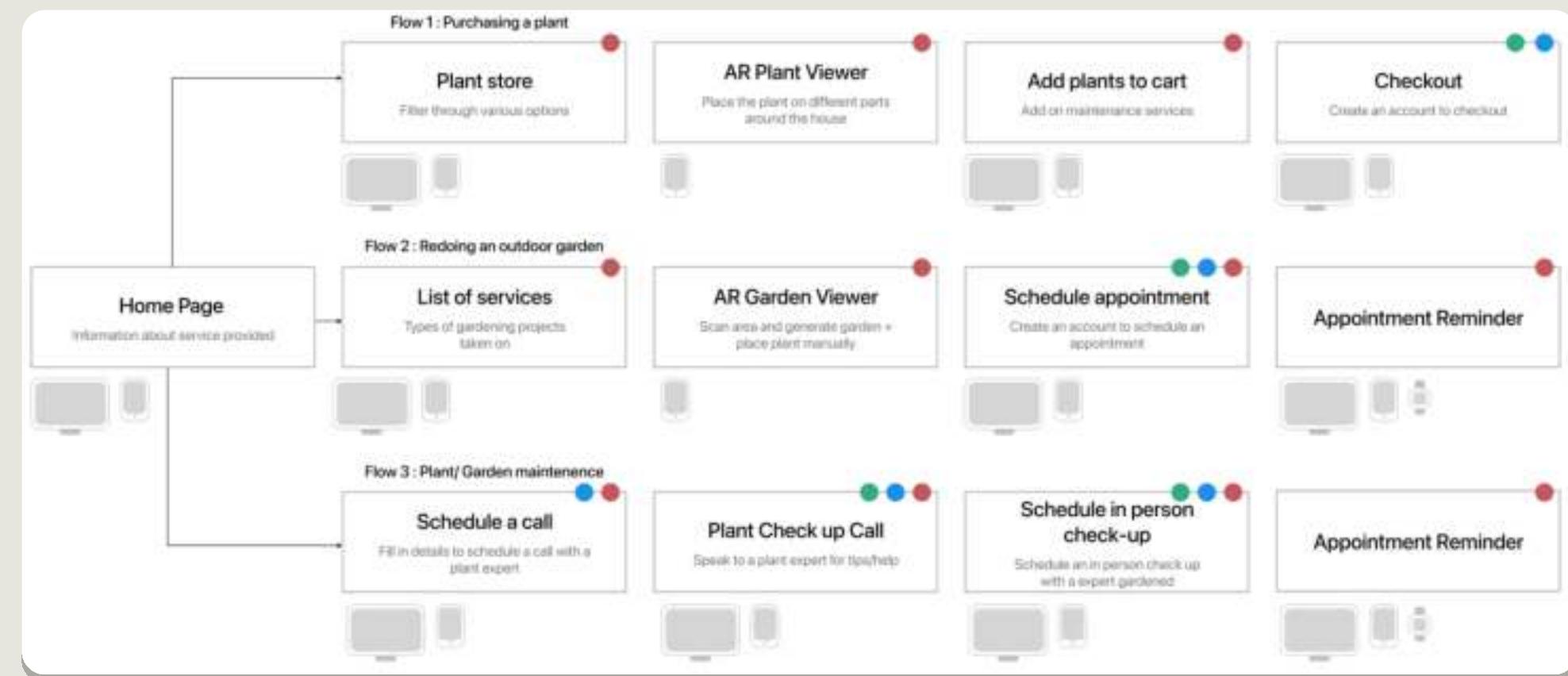
We thought about what the minimum viable product for our service could be. We knew from talking to users that there was value in helping them visualize how their plant purchase would fit into their living space. Users gave us ideas we would never have thought of on our own. A particularly petite person shared their frustration with plants that grow too heavy for them to manage. They were also interested in ‘trying on’ different pots for their plants (and of course, knowing the different weights of those accessories). Likewise, another user expressed interest in seeing how large any potential purchase would grow over its lifetime. These user hopes and anxieties were translated into rough sketches.

The sketches turned into lo-fi wireframes and our idea began to take shape. As a team, each member contributed in unique ways. One member found a wireframe library to pull from, which kept our work consistent. Others wrote the text and imagined layout.



# Over the course of this semester, the concept of ontology stayed with us. This project forced us to consider ‘what is’ and ‘what could be from the perspective of our personas.

We found the value map example shown in class to be an appropriate way to organize our thoughts. We wrote down the screens and flows that we felt should exist. For each screen, we determined which device(s) would be most appropriate for our users as well as who we were serving by providing each screen.



Beyond these initial thoughts, we began wondering how our personas would interact. Would these screens allow our users to connect more effectively or were they contributing to the anonymization of the purchasing process? What is lost in a digital transaction compared to an in-person one? Is our technology humane?

With each answered question, a new one appeared. We decided the service provider should have a tablet, since they work in the field. Great, but how does the tablet display differ from the desktop? Is it more utilitarian than what the customer sees? Why or why not?



# Critique took our divergent storylines and converged on a single plot, starring our gardening actors.

We were having too much fun diverging on features for our service. We had an e-commerce site, a garden visualization tool that leveraged augmented reality, helpful articles, and even a tiered service model for garden maintenance! While this was exciting, it became a constraint and kept us from exploring any one story deeply. After some timely in-class reminders that what we were building was an MVP, we knew we had to go back to the drawing board. Pulling from our storyboarding and critique sessions, we agreed to focus on the 'Garden Creator' flow, since it achieved one of our main goals the most - pulling in the next generation of gardeners and removing friction from onboarding them into a new hobby.

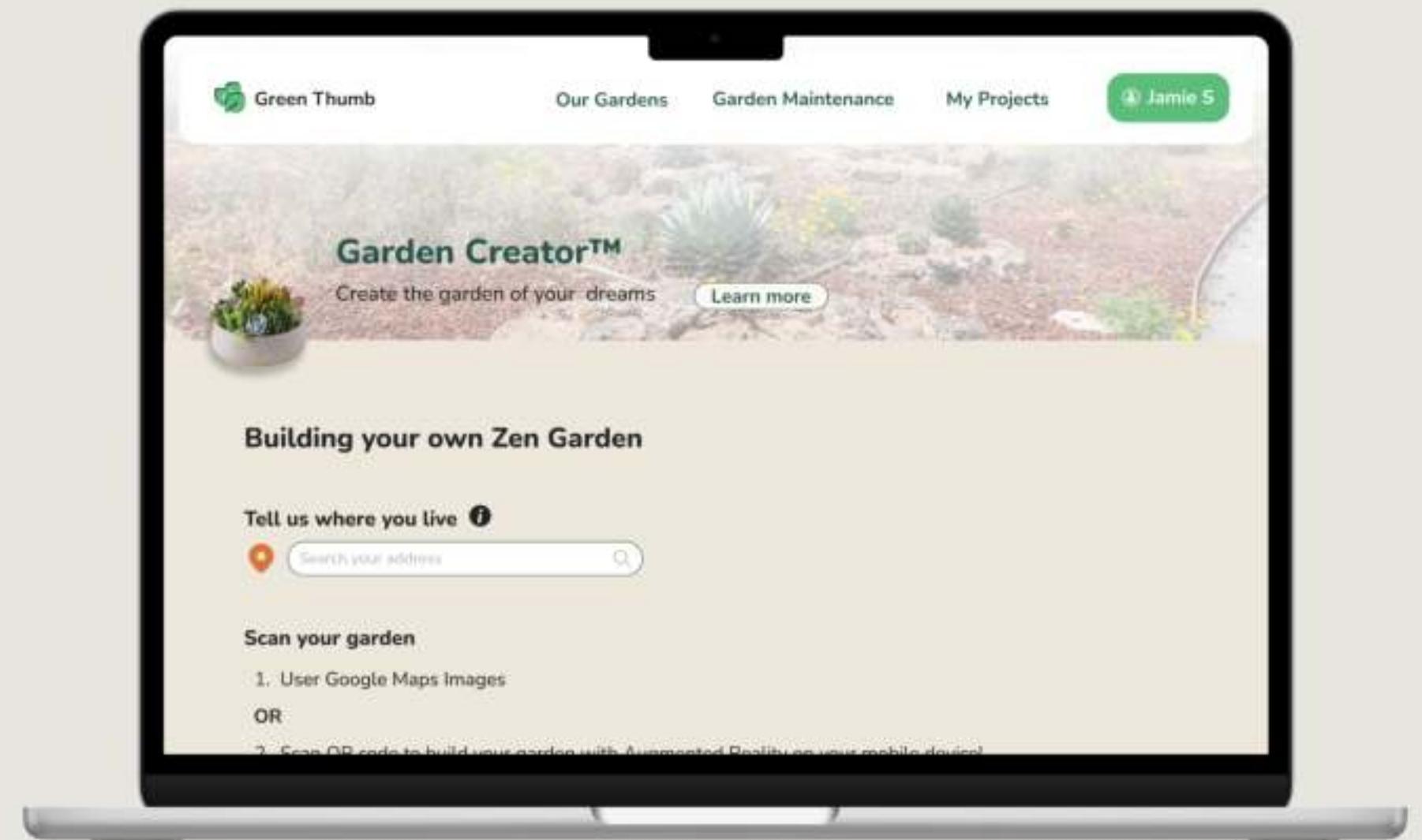
Our divergent home screen

Convergent focus on Garden Creator on the home screen

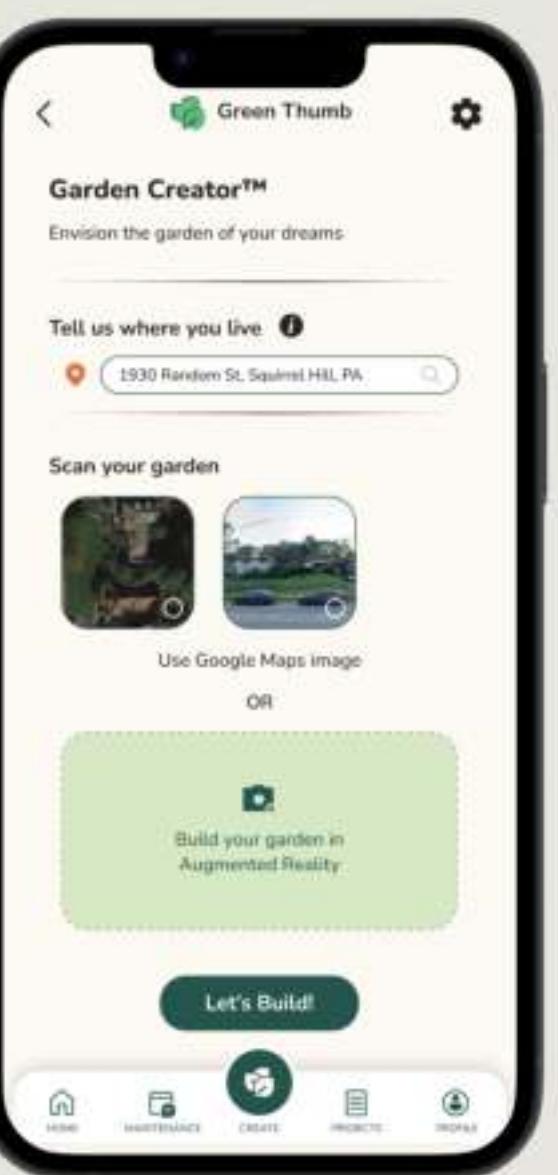
# Moving from a ‘mobile first’ to a ‘task first’ approach.

As designers we are always told to create ‘mobile-first’. But this project made us question that assumption. While a mobile first approach takes into consideration how users would engage with our product on a smaller screen size, and incorporating the most important features first, while we designed this gardening app, we realised that we had to take a slightly different approach, a ‘task first’ approach. Each device has its own set of limitations and hence we started with thinking about how the flow of our product would change with every device. How users could use our AR product on the mobile app to build their dream garden while standing in their backyard but also have an equally engage time designing their dream garden with images or stills from Google Maps on their laptops. What are the tasks users would take up on one device over another. We focused more on the ease of interaction while considering the technical capabilities of our actors.

A mobile first approach would have led us to replicating the same flow across devices, but through our designs we wanted to cater to the various types of customers using our product.



Garden Creator - flow on desktop

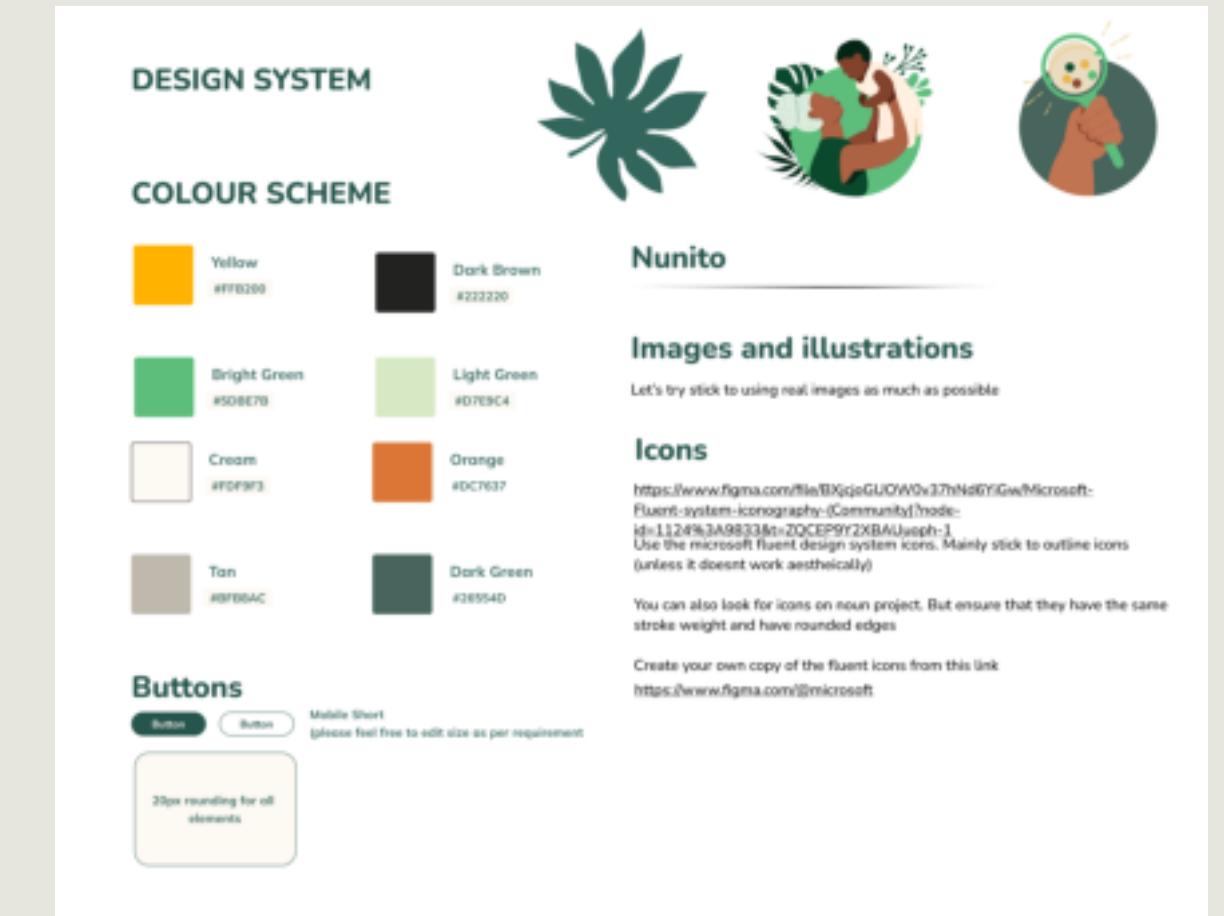


Garden Creator - flow on mobile

# Building cohesive designs together

## Colour, typography and icons

Based on our learnings from our various modules, we started with building a common design system to ensure **consistency** in our work despite asynchronous work and varying experience levels. This not only gave us a guideline to follow but also built shared vision of our designs. Since we were focusing on responsive designs, our design system also focused on different button sizes and controls for various devices.



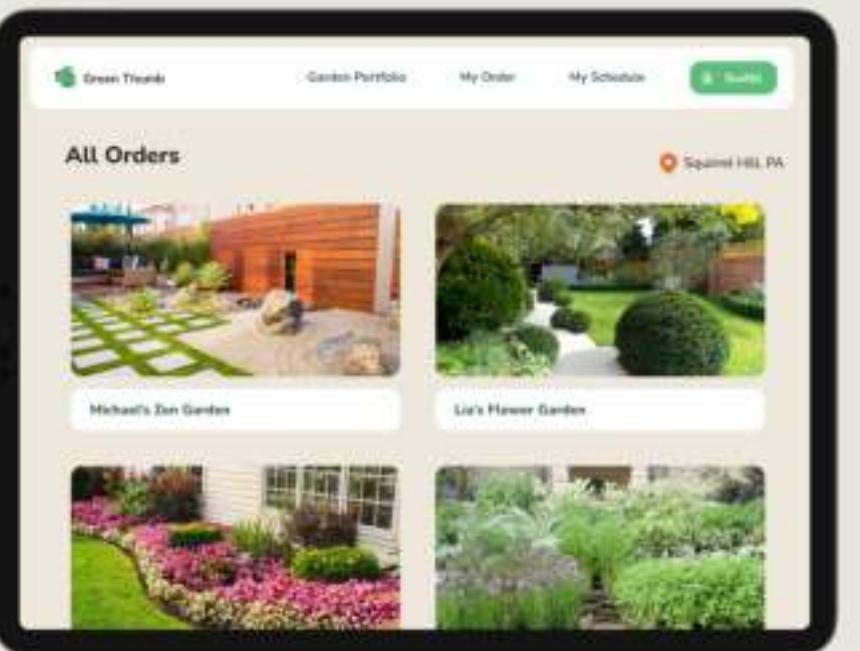
Green Thumb design guideline

## Considering the business in our user flow

During our conversation with Dan Staffer, we realised that while we had a linear information architecture, it wasn't the most efficient one. Considering the heterarchy of the data, we decided to make our design decision keeping in mind the business. Efficiency is crucial for the business. In our case, the businesses main aim is to get our users to schedule an appointment in the shortest possible time. Having multiple preliminary steps could lead to increased drop offs, increased time to complete goal as well as user frustration and boredom. We then cut down a few of initial our steps with an aim to get users to the garden creator in the shortest amount of time.



Introducing filters instead of additional pages to reduce the number of screens and steps

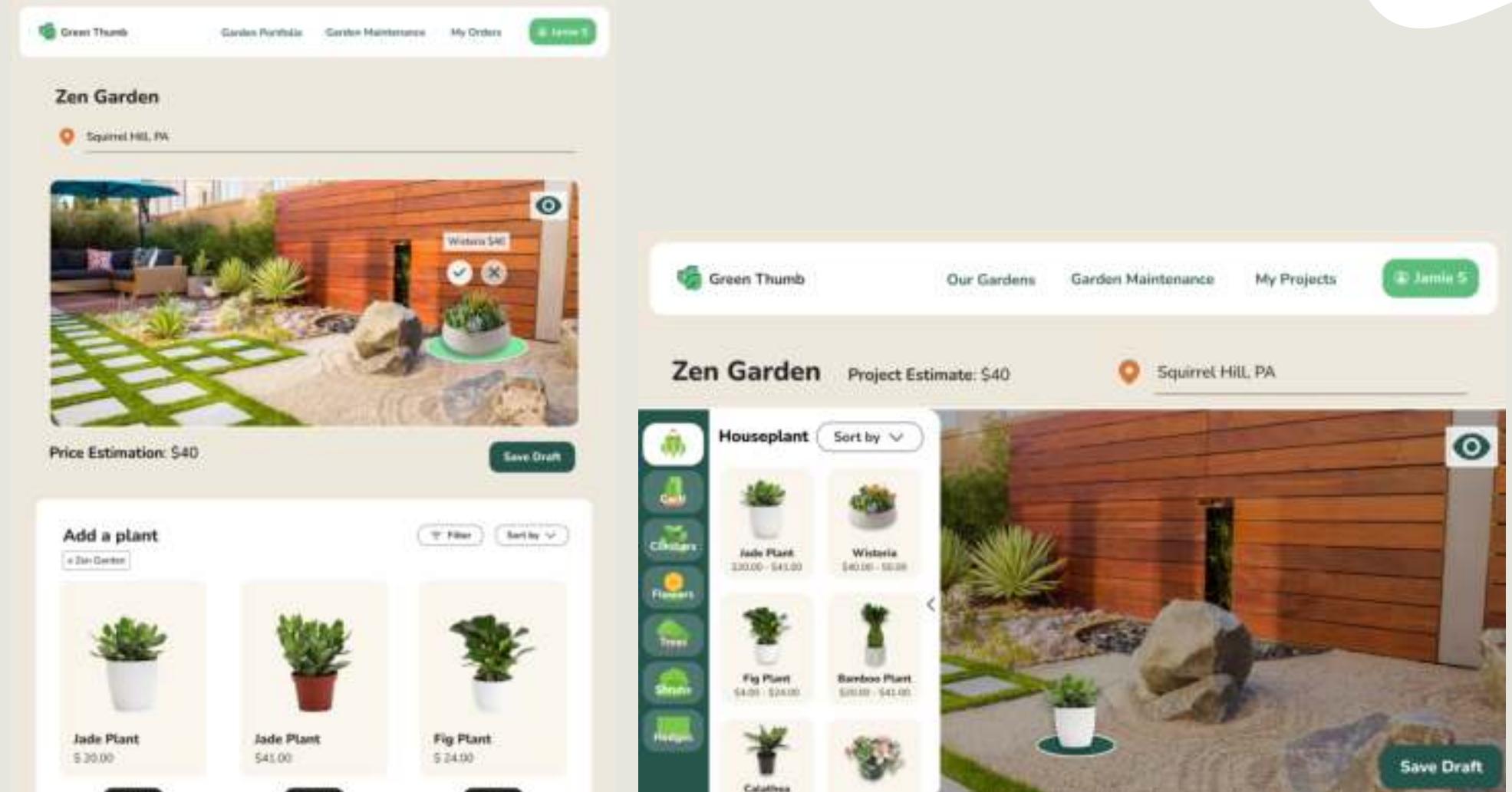


Having only a tablet version of the application for service providers keeping in mind where and how they would use the product

# Building cohesive designs together

## Choosing design patterns for different devices

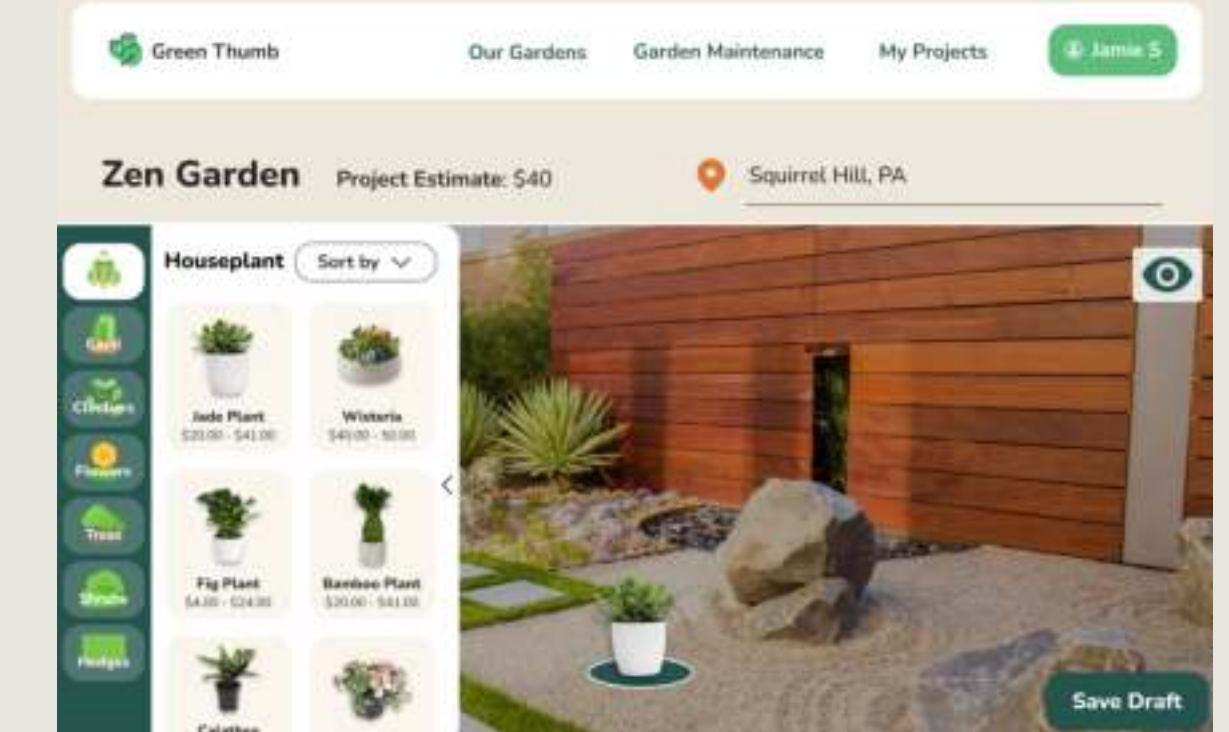
When we initially started building our low-fi prototypes, we started with replicating the same design pattern across the devices we were designing for. But then we realised the mistake in doing so. While it builds consistency across the product, it doesn't take into account efficiency, cardinality and ease of use.



Moving from a scroll pattern to a drawer pattern for the 'add a plant' option to increase discoverability and bring cardinality in the design

## Conflict of showing and hiding information

Providing ample information empowers the consumer in making their decision while increasing trust in the business due to transparency of information. But, a conflict that arises with providing too much information is increasing cognitive load. Hence, while designing our screens at multiple points we have to make crucial decisions around what information to show vs what we can leave out. Information always seems like it could be of value to the consumer, but we realised that the time and place the information is displayed also needs to be taken into account while designing. For example, while designing screens for the watch, we took active calls on how much information is sufficient to show within the small screen area.



This is another screen where we had a similar challenge. We were conflicted between showing the price estimate of each plant as well as the project cost.

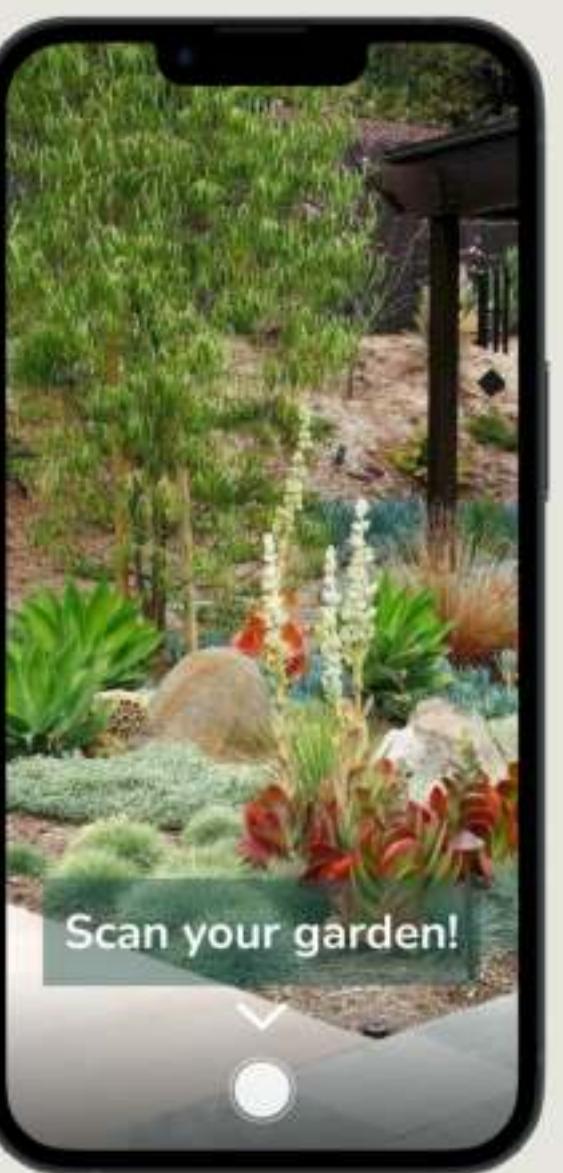
# Using 'less is more' while pitching our idea

While we had designed screens for versions of the product on various devices, during our final presentation we told our story only using the desktop flow. We wanted our investors to focus more on our story and the product offerings. While we mentioned and even showcased all the other screens at the end of our pitch, we didn't want the varied flows of our product confuse the panelists while we were introducing the product and concept to them.

We were to also use 'wizard of oz' to show how a user would scan the QR code on their phone and go to their backyard to scan and take images of their garden, but due to a mix up with a phone which was used for recording our presentation, we were unable to do so and had to improvise the flow of our presentation on the spot.



Garden Creator - flow on desktop



Screens showing how a user would scan their garden with their phone

# Individual Reflection

# Alex's Reflection

Reflecting on the past two projects, I realize the value in mixing up teams between MHCI and undergrad students. Many of the MHCI students have a rapport with each other from many shared classes and experiences. Undergrads force everyone to break out of just working with who they know. One of my pieces of feedback in a past project from Sarah was to make sure quieter voices are heard. I worked on that more in this project, encouraging a quieter team member to jump in between the two louder ones. Other feedback that was instructive from past projects includes generating a greater quantity and variety of ideas and to use fewer fonts but more columns to increase legibility.

Without intending to, our design process mirrored the double diamond model perfectly. We started with a ton of ideas, narrowed in, went deep on several, and then picked one to showcase.

As far as legibility, I made sure to use a 12-column grid for this reflection and stick to just two fonts in our designs. This project felt coherent in a way that the data-driven display did not. In a way this is surprising because of the quick turn-around on deliverables.

I'll definitely use speed-dating in future projects. One thing that still seems murky after several Zimmerman articles on speed-dating in multiple classes is how to guide users to react instead of just respond with which storyboard is their favorite. I think honing in on this will take some time.

This was an informative project. In a way I'm glad I got a domain I had little familiarity with so I didn't bring in biases or pre-conceived notions of users and industries.

# Aradhana's Reflection

A responsive web design is a design approach that ensures that a website looks and functions well on different devices and screen sizes. As more and more devices are becoming a part of our daily life, more crucial it is to consider the design implications of these various devices. In my previous designs, I have always recreated a product across devices. Maintaining the same set of functions, capabilities and design on all of them to ensure consistency. But, my biggest learning from this module is the importance of considering the environment as well as the usage of the product while designing for various devices. An app on the phone and on the desktop need not have the exact same features in the exact same spot. Optimising the product for efficiency is crucial.

Another personal learning I had in the project is how to balance the different work styles of various team members. While some team members might prefer to work in person and complete all tasks as a group, personally while designing I need my own time and space to reflect and create. I have always put the quality of work above meeting deadlines. But with this module, I tried to respect the working styles of my other team members by achieving a balance of both. Having continuous team meetings

gave us the flexibility to design on our own time and space while having continuous feedback and discussions on what we made.

Learning from my last module, before we started designing our screens for this project, having the most design experience in the team, I took up the responsibility of creating a design system that we could follow for all the pages. While I was hoping that would be enough, I realised that there were still big differences in each of our styles. Differences in the use of shadows, colours, gradients and placement of images. Hence, I then created one screen which we discussed and then used as a template for our entire product.

Even though being a designer with few years of experience, this class has taught me a lot about how to pitch, how to give and get critique and how to work with a team of designers with different backgrounds and experiences. This has surely boosted my confidence as a professional and in the work I create.

# An's Reflection

My previous understanding of responsive web design is about how to present the same content on screens of different sizes so that people with different devices could have the same experience. This project helped me realize the difference between “different devices” and “screens of different sizes.” Each device is its own way of communication, and the experience is meant to be different, especially considering that people nowadays often own multiple devices at the same time. Therefore, an important part of RWD is to utilize the strengths of different devices and tie them together. Switching from one device to another shouldn’t interrupt the user experience. In our case, parallel user flows were designed for desktop and mobile, and a QR code is placed at the breakpoint to allow a smooth transition between devices.

Another part I love about the project is the rapid research we conducted. In other courses like UCRE, user research is conducted in a more cautious and structured way where target groups were strictly defined, participants were carefully filtered, and scripts were written for each interview. In rapid research, we have to interview whoever we can find. This actually helped us gain very diverse reactions regarding our product. It is especially

interesting to interview elderlys - my scripts didn’t work very well! They love digressing. While some topics are just irrelevant, some can be valuable insights that we young people are overlooking.

Regarding teamwork, both my teammates are MHCI students with years of experience in the industry. When working with SCS undergrads, we often prefer virtual meetings, and I never really understood how to use whiteboards and sticker notes efficiently. However, Alex and Aradhana are whiteboard witches! Ideas were sorted out on whiteboards and quickly organized, then space was moved out for new tasks while older notes stayed in sight of view. Working with them helped me understand the usage of whiteboards, and visualize what HCI meetings are like in industry settings. In addition, I learned more tricks in Figma and gained practical experience using design systems for asynchronous collaboration in design tasks. I even learned a few new HCI jargon.

Overall, this project really enhanced my understanding of RWD and the industry of HCI.

## Appendix: Personas



# Ron Sestili

BUSINESS OWNER



73 Years



Pittsburgh, born and raised



Schenley High School



Business Owner



Lives with his wife and son

## PERSONALITY

- Personalized attention to each customers
- Focuses on smaller details and quality
- Does not completely trust the son to run the business alone

## FRUSTRATIONS

- Having multiple orders at once
- Dealing with new technology and updating
- Figuring how to retain and attract employees
- Finding the next generation of customers
- Retail/commercial clients only care about the bottom line; they're not as easy to work with as residential customers.

***Kids nowadays do not have  
the patience for landscaping***

## **GOALS**

- Providing quality service to customers
- Continuing the legacy business
- Maintaining relation with old customers
- Teach son how to run the business

## **TECH CAPABILITIES**

Mobile Apps



Software



Social Media



## BEHAVIOUR

- Prefers to connect with customers over a phone call
- Quality > quantity or profit
- Experimented with different services for his customers
- Comes to work early in the morning and leaves by mid-afternoon
- Takes off on Sundays
- Tries to cater to all customer needs, even if it conflicts with his business' needs



“

**These guys (family he works with) are old school. They're not interested in using technology for the business. My customers are also old school, most are over 60. The younger generation just wants a plant 'that won't die.'**

”

# Paul Sestili

SERVICE PROVIDER



42 Years



Central Oakland, Pittsburgh



Bachelor's in Landscape Architecture



Landscape Architect



Wife and kids, works with his Dad (business owner) and Uncle

## PERSONALITY

- Friendly
- Laid back

## FRUSTRATIONS

- Decreasing staff availability
- Retail isn't a necessary part of the business but it takes up time
- May feel differently about business decisions than his family
- Deer have made it impossible to have most plants outside the shop

## **GOALS**

- Increase staff so he can focus on residential projects
- Showcase recent work that leverages technology (phone app to control landscape accent lighting)
- Close down the retail side of the business

## **TECH CAPABILITIES**

Mobile Apps



Software



Social Media



## BEHAVIOUR

- Goes with the flow of the business' traditional way of doing things; not pushing tech
- Doesn't check yelp or facebook for business reviews



**“My yard is my pride and joy!**

# Joe Bisham

## CUSTOMER



64 Years



Squirrel Hill, Pittsburgh



Monterey High School



Business Owner (Pizza Parma)



Empty nester, lives with wife and their dog.  
Kids have all left Pittsburgh

## PERSONALITY

- No BS, old school personality. Appreciates a firm handshake and eye contact

## FRUSTRATIONS

- Deer keep eating his plants and ruining his garden
- His kids keep bugging him to upgrade his flip phone but he's resisting.

## GOALS

- Have a front yard with a diversity of plants that he can be proud of, made possible by an old acquaintance that he has an ongoing rapport with.
- Develop his hobby of gardening; spend more time on this once he sells the pizza shop and retires.

## TECH CAPABILITIES

### Mobile Apps



### Software



### Social Media



## BEHAVIOUR

- Swings by Sisteli's to chat with the family once a month; it's a 10 minute drive from his house in Shadyside.
- Has a standing Sunday morning breakfast with his buddies at Denny's. He's ordered the same thing for as long as he can remember.
- Still has an AOL email address; rarely checks it.
- Goes on facebook every now and then on an old desktop



“

***I want to learn more about gardening  
but I just don't have the time!***

”

# Samantha Ridge

## CUSTOMER

- 28 Years
- Bought a new house in Lawrenceville, Pittsburgh
- Bachelor's in Computer Science
- Software Engineer
- Lives with their partner and her 2 cats Ester and Lilly

## PERSONALITY

- Patient and easy-going
- Introverted and afraid of asking for help
- Hard working and spends most of her time at her office

## FRUSTRATIONS

- Deers keep eating their plants
- Plants keep dying
- Have to keep mowing the lawn
- Don't know which types of plants are safe for her cats

## GOALS

- Have a nice-looking garden which is easy to maintain
- Create a safe and fun backyard for her cats
- Keep the budget low because they don't have a lot of savings yet

## TECH CAPABILITIES

Mobile Apps	● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
Software	● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
Social Media	● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

## BEHAVIOUR

- A newbie in gardening, still quite clumsy around gardening tools
- Work full-time and only have time for gardening during weekends
- Love her cats with her full heart

## Appendix: Scenarios

## SCENARIOS #1

Katie, 23, has found an appreciation for how plants can transform an indoor space. It started with succulents and now she's wanting larger potted plants. One issue she runs into is that it's hard to visualize how a large plant will look in her small 1-bedroom apartment. She's purchased plants before and had to return them after they didn't suit her vision for her apartment. While looking for nurseries in Pittsburgh, she comes across Sestili. She's delighted to find that they have an augmented reality filter that lets her see each plant in inventory in her apartment, even a giant banana tree. After seeing 5 or 6 plants, she comes across a snake plant that looks perfect next to the window by her desk. She purchases the plant online to make sure it's reserved and grabs the keys to drive to the nursery.

## SCENARIOS #2

David is a 40 year old computer engineer who recently bought an apartment for his parents in Squirrel hill Pittsburgh. He wants to get the house done up with a modern aesthetic. As a kid, he used to have a Koi pond in his house and loved playing with the fish when growing up. As a homage to their first home, David also wanted to have a Koi pond in the front porch of his new home. Being new, he didn't know much about the famous landscape designers in the area, so his neighbours shared the website of 'Landor', a boutique landscape architect whose speciality is modern aesthetics. He looked at their portfolio online and being extremely impressed by both the visual style of the website and their work itself, he scheduled an appointment online. He's extremely happy that he can finally give his parents the Koi pond they always wanted.

## SCENARIOS #3

Cella and her husband live with their cat and two children. As the children are growing up, Cella wants her kids to spend more time outside playing in the backyard than sitting in front of the TV. But, being a working mom she is worried about the children's safety as she cannot spend all her time ensuring that the kids do not touch any plant that could be harmful or eat anything inedible in their mouth. Cella wants to redo her backyard but doesn't have the time or knowledge of what would be the right and safest plants to have in her backyard. While looking for a solution online, she comes across a website called 'Planted'. The website contains information about what would be the right plants to have and also information on how to maintain them. The website also has a feature which provides personalised online assistance. She sets up a meeting with one of the lead gardeners to knowledge on what plants to keep and which ones to replace. She loves that the website also talks about maintenance as it would provide her with tips on how to continue to maintain the garden.

## SCENARIOS #4

Michael a PHD student at Carnegie Mellon recently moved to Pittsburgh from LA. While moving into his new house, he realises that his yard needs a bit of mowing and weeding. As he has no knowledge of how to do it or who to call, he goes online to look for any help he can find. During his search he comes across an ad for an app called "Lawnrabbit". The app lets him schedule an appointment for tasks such as lawn mowing or snow shoveling with just a few clicks. Amazed by how easy to use the app is, he downloads the app and makes his next lawn mowing appointment.

## SCENARIOS #5

Samantha and Eve, a young couple who just purchased a house in Pittsburgh, want to plan out the budget for their unfurnished garden. They feel really frustrated that most landscaping services online do not show their prices, even for simple and standardized services such as pavement construction. Luckily, they eventually find the Sestili Nursery website, which displays their past projects and the corresponding price breakdown. Even better, they also have a service price estimator which calculates the budget given the dimensions of the garden, the type of construction materials, etc. Samantha and Eve immediately decided to stick with Sestili Nursery because they don't want to bother researching the less convenient landscaping websites anymore.

## SCENARIOS #6

Thoman and his wife recently moved to Pittsburgh. They moved into an old mansion built in the 80's. The mansion had been empty since covid due to which the patio can do with a bit of retouch. They try to look for landscape artists and come across a long list or vendors but are unsure of who could be the most reliable and best person for the job. During their hunt, they also come across an app called 'Greenary'. The app contains a list of all the landscape artist in the area along with portfolios of their work as well as the most recent reviews from trusted customers. Thomas and his wife are extremely delighted to come across this platform and after a bit of research they find Sistelli's to be the perfect match for their job. The contact Sistelli's using the contact details given on the site and schedule an appointment with Ron.

## SCENARIOS #7

Ron runs 'Sistelli's' Nursery, one of the oldest landscaping business in Pittsburgh. Ron's becoming old and not as agile as he used to be. He finds it very difficult to keep track of all the bookings and projects taking place. Ron's son introduces him to an app called 'Landscaper'. The app lets business owners keep track of all their current schedules while also helping them block future appointments and accurately maintain their timelines to increase revenue and logistics. Ron finds the app of much aid. His favourite feature is the one where he can just add in the appointment and time and it automatically understands the timeline of the project and even suggests number of employees needed on the job

## SCENARIOS #8

Sophia is extremely passionate about landscaping and loves to see pictures of project make overs. Since her retirement from her desk job, she keeps herself busy by reading about gardening tips and taking care of her garden. Her daughter send her an email about with a link to a website called "Greenroots". She's excited when she sees all the various editorials on patios and gardens and videos on the various makeover projects by different landscape architects. Having discovered this piece of treasurez she spends most of her time reading the various tit bits on the website

## SCENARIOS #9

Jade is a long time resident of Pittsburgh, he's been living in the same house ever since he moved there. Upon his children's insistence, he finally decided to get his porch redone. A man with an obsession for meticulousness, before he gives the contract to any vendor he has to ensure that they can get the job done at the quality he is expecting. After looking up a few unsatisfactory websites, he comes across "Greenary". He sees information about their latest projects and even in progress blogs around projects they are currently working on. Satisfied with their commitment to work and quality, he calls them up to schedule an appointment with them.

## SCENARIOS #10

Reggie has been working from home since the pandemic started. He's noticed his neighbors' lawns have transformed and evolved over the past few years. He'd like to do something to improve his lawn but has no idea where to begin. One of his neighbors recommended Sestili nursery so he looks it up online. He browses through the portfolio of landscaping projects and falls in love with a picture of a custom patio. He calls Sestili Nursery to schedule a consultation and then calls his neighbor, excited to talk about the patio project!

## SCENARIOS #11

Mike picks up the phone at his family's landscaping business. It's Carnegie Mellon calling and the person sounds desperate. "Our scheduled snow removal service for this week just canceled on us and there's 8 inches of snow forecasted for tomorrow!" Mike says not to worry, he'll take care of it. He quickly pulls up the 'rent-a-landscaper' app and punches a few buttons, selecting the type of work to be done and how many workers he'll need. On the other side of town, John's phone buzzes. He's just gotten a request for snow removal. Because he's never done this type of work, there's a short training course outlining the relevant information to do a good job and stay safe. Both men put their phones back in their pockets, happy that their problem has been solved.

## SCENARIOS #12

Kelsey and Ken met through Tinder. They use Yelp to find restaurants. They rely on Amazon reviews to buy products for their home. Simply put, they value other peoples' opinions to ensure they have great experiences. So when it came time to pick out some plants for their apartment, they used the cool new plant app, Planter, to generate recommendations for what they should buy. They loved the easy sign up process and the questionnaire that ensured their budget, style, and constraints would be factored into the results they browse.

## SCENARIOS #13

Peter grew up working at the family nursery owned by his father. He went to college for landscape architecture so it's safe to say he knows the subject pretty well. But it's another thing entirely to run a business and despite working closely with his father, there's still things he doesn't know how to do. Lately his dad has been bringing up retirement more frequently. This worries Peter. He knows he needs to learn more in order to keep the business running smoothly but there's never enough time. While chatting about this problem with his friend, he was told to check out BrainDump™ - an app that provides helpful prompts and questions to capture insights from experts. His dad agreed to try it, and slowly but surely has been using the voice capture feature to talk about various situations he's run into over the years. Peter is sleeping soundly knowing that he'll have all the info he needs whenever his father chooses to retire.

## SCENARIOS #14

White-tailed deer. Bucks. Fawns. Does. They're everywhere in Pittsburgh and lately, Joe is getting fed up. They're ruining his plants and meticulously-cared-for garden. At his wits' end, Joe googles 'deer deterrence Pittsburgh' and Sisteli nursery pops up. As he reads about their deer consultation service, he grows more and more hopeful that they can put an end to the deer induced chaos outside. After setting up an appointment online, a friendly employee comes out to Joe's property to assess the situation. He spends time taking pictures and cataloging the various species of plants that Joe is trying to grow. Afterwards, he sits down with Joe to outline a multi-step program of treatment that will keep the deer away and let his plants grow in peace. Joe ends up purchasing the program, relieved that there is an end in sight. Looking out his window, he sees a pair of doe eyes peering in at him while munching a juicy, dirt-covered strawberry.

## SCENARIOS #15

Tina and Tim have been calling around for landscaping service but every business is booked up for the year! Finally they call Sestili Nursery and are directed to fill out an online profile for the customer portal. There they can see estimated wait times for project completion along with prices for types of landscaping jobs. They put down a deposit on a retaining wall and see that it's scheduled for two months from now. Happy about crossing this off their to do list, they think about what other home projects they can work on in the meantime.

## SCENARIOS #16

Miranda finally has her own apartment in Pittsburgh. She wants to furnish her new home with some delightful plants. Unfortunately, she has no knowledge about plants and her plants keep dying. She complains about the problem when she is picking up new plants in the Sestili Nursery near her place and was recommended to subscribe to their premium landscaping advising service - they would send her a gardening guide for newbies and would help fix the plant when it's sick. Miranda realizes the service is much cheaper than constantly buying new plants and happily paid for the subscription. She feels very accomplished now that she can finally keep her plants alive, and the nursery is also happy that they are able to establish another long-term relationship with their customer.

## SCENARIOS #17

Mr. Xiong, 53, is an immigrant with a hobby in gardening who just moved to Pittsburgh. He has been experiencing a deer problem that never happened back in China. Knowing no one in the neighborhood, he consults the only resource known to him - Google. He finds a detailed article published by Sestili Nursery on deer-resistant plants suitable for Pittsburgh gardens. Impressed by the writer's expertise, Mr. Xiong trusts them and purchased the recommended plants from the website. He received high-quality plants with a great delivery service and is able to get rid of the deer in his garden. Happy with the result and eager to build new connections in the country, Mr. Xiong soon becomes a frequent customer of Sestili Nursery.

## SCENARIOS #18

Harry, 74, is the owner of his family nursery. He values the connection with his customers and has known many of them personally for decades. However, the younger generation of customers relies a lot on social media and does not like to keep in touch in traditional ways, and the only way Harry knows how about communicating online is through email. Luckily, his son finds an amazing app that only requires him to film a video. The service would then parse the speech in the video and generate a social media post. With a single click, the post would be updated synchronously on their website, Facebook page, Yelp page, etc. And the responses from users will also be sent in the format of a report to Harry's email address. In this way, Harry finds it much easier to keep in touch with the younger generation.

## SCENARIOS #19

Jason is a man who takes great pride in his gardens. Whenever he calls landscaping service, he goes into great detail questioning their procedure and insists to supervise the construction all the time, which is both time-consuming for Jason and bothersome for the landscaping company. Finally, he finds a new company that has a detailed service breakdown page on their website, explaining what procedure will be taken for the garden. They also update the process of construction via text and email messages. Jason finally feels he could trust this company with his garden, and the workers finally get a break to focus on constructing without Jason supervising them all the time.

## SCENARIOS #20

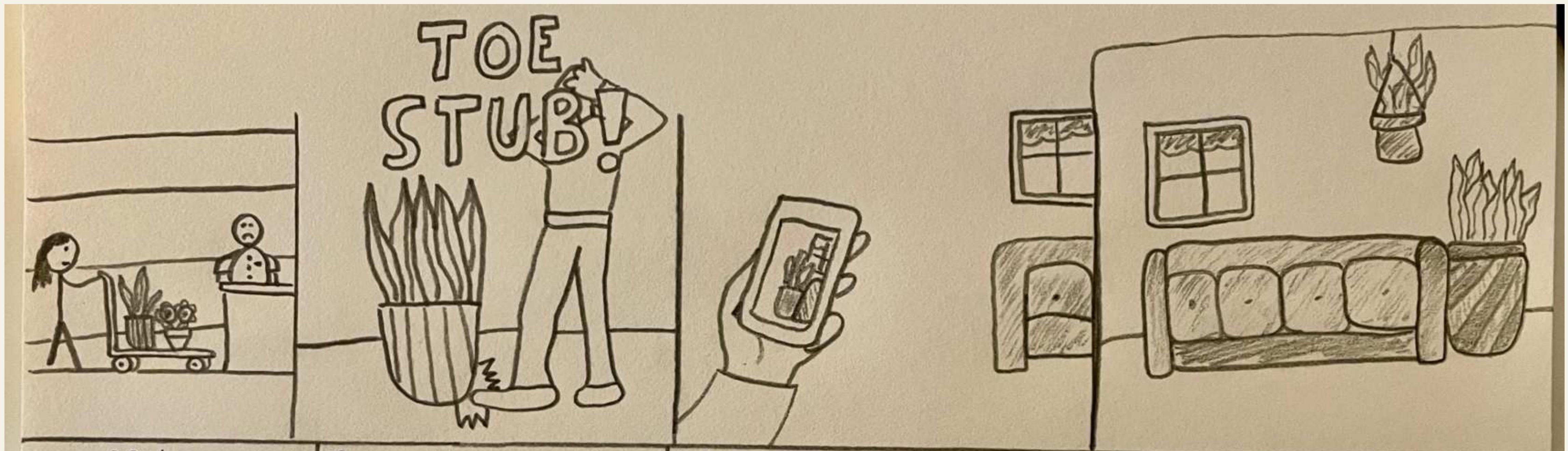
Robert has been working in a plant nursery for years. As a person who cares deeply for his customers, he would go on adventures helping his loyal customers to look for exotic plants that would add diversity to their gardens and at the same time survive Pittsburgh weather. This is a service that has barely been generating revenue in the past years. He has to shut down the service during COVID. Luckily, a friend suggested he record his knowledge on a personal blog, and these journals soon gain popularity online among the gardening community. And Robert was eventually able to keep the business running by charging from his readers.

## SCENARIOS #21

David newly purchased a new house with a furnished garden. He is happy with how the garden is but finds it difficult to maintain it. In fact, he doesn't even know the species of the trees in his garden! Luckily during his research, he found an app called DIY Gardeners. The app not only has an AI-powered service for identifying plants and plant sickness in his gardens, but also provides access to an online community of local gardening enthusiasts. David soon finds it easy to maintain his garden and even starts considering upgrading it because he gradually develops a passion for landscaping while visiting the online community.

## **Appendix: Storyboards, Speed Dating Results, & Lo-fi Prototypes**

# STORYBOARD #1



Katie, 23, has gotten a bad reputation for buying and returning plants at her local hardware store. This is actually the third trip she's made this week!

The problem is that she has trouble visualizing how plants will look in her small, 1 bedroom apartment. Plants that look so good in the store end up being too large or just not suiting the layout.

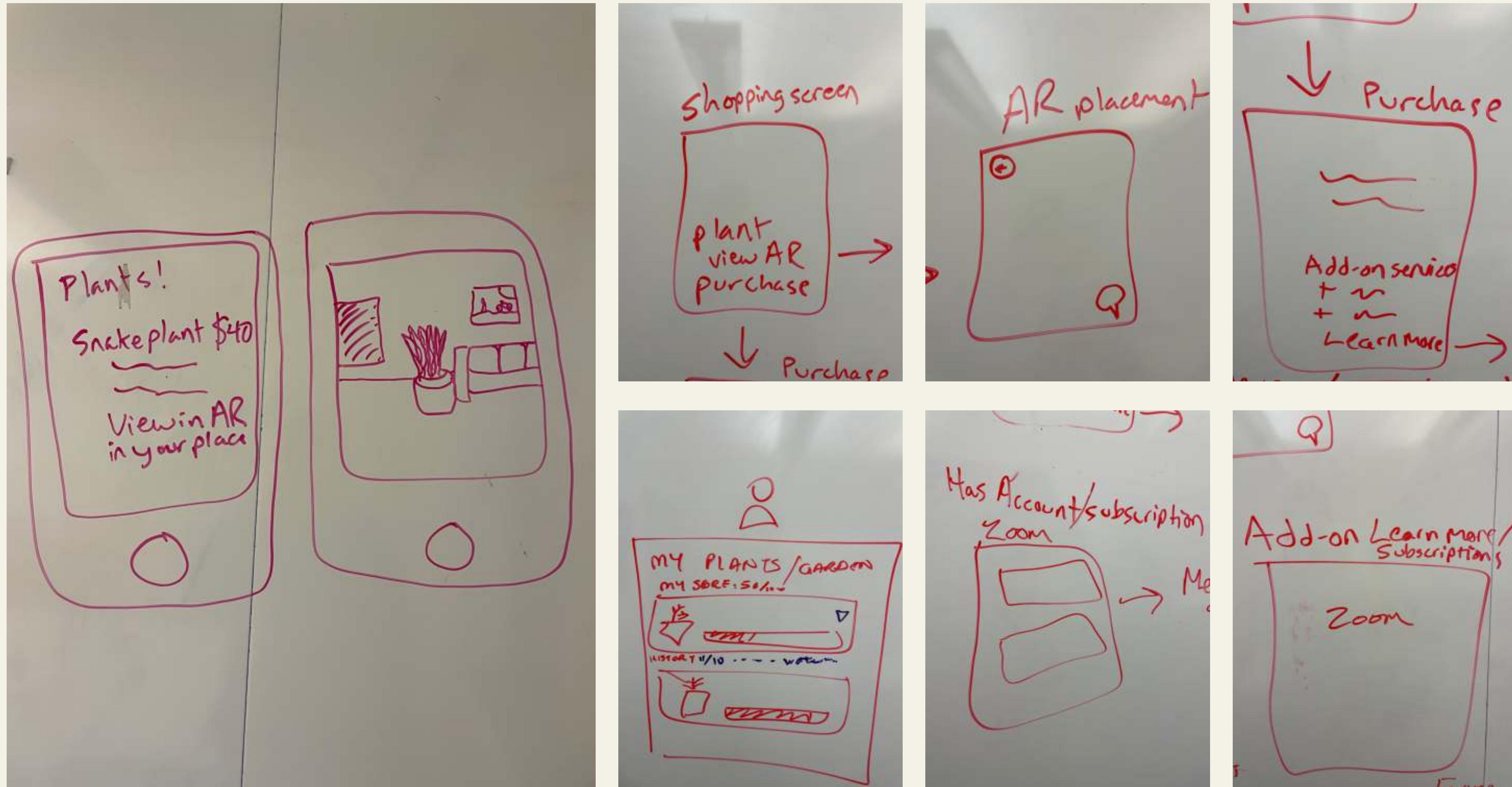
A friend recommends an online plant service that uses augmented reality to display plants in a user's space. Katie tests out a few different plants next to her couch and settles on the perfect snake plant. At checkout she decides to become a member to get additional benefits.

Katie is so pleased with her first purchase that she becomes a repeat customer! Her space is more green and inviting. She even starts hosting more get-togethers and her friends are impressed by her eye for interior design. No more repeat returns!

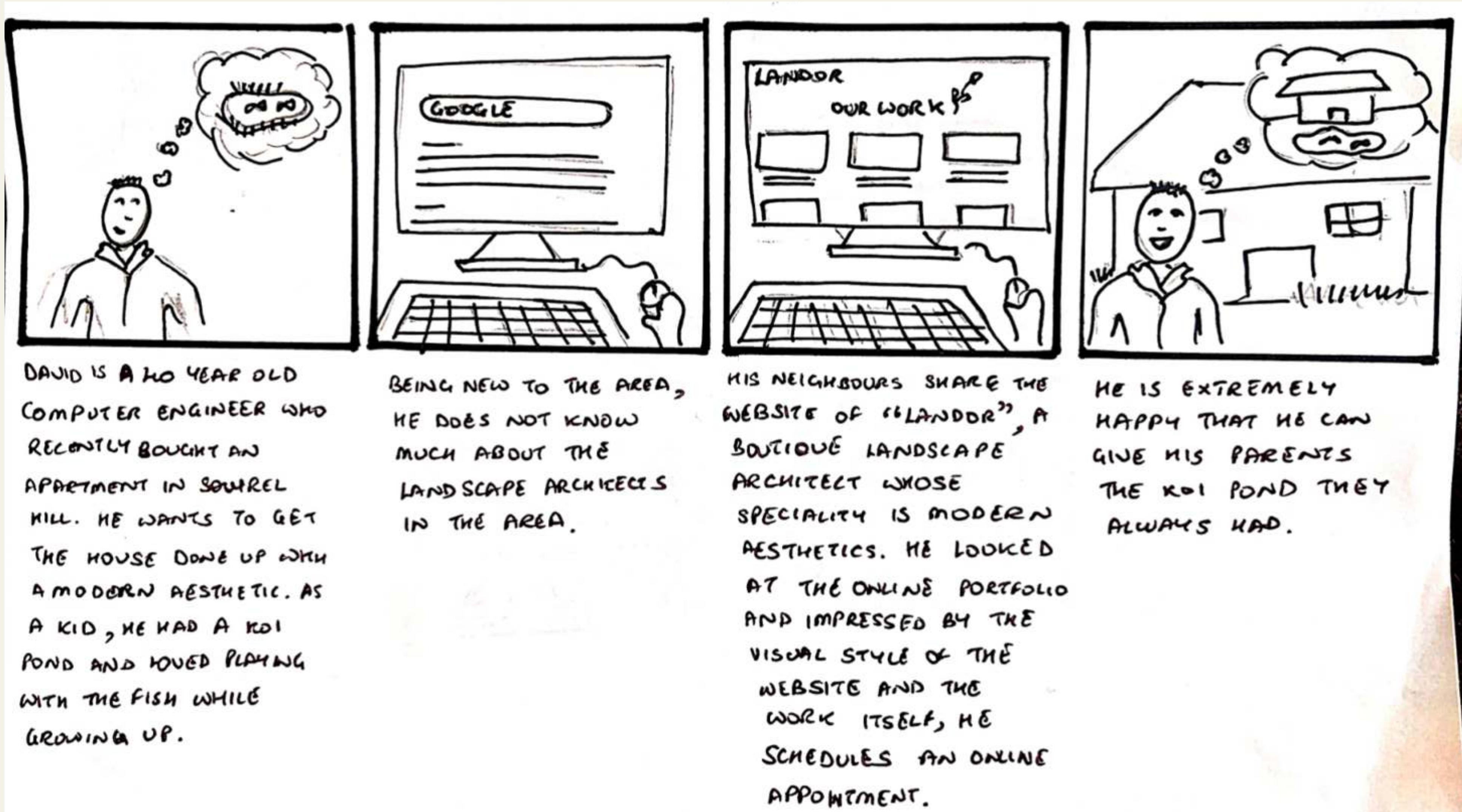
# STORYBOARD #1 - Speed Dating Comments

- This is a great idea
- I feel this pain from living in NYC so didn't have much room.
- Pretty tough return policy
- Saw the plants out and about but they seemed small in the warehouse setting but were huge
- I don't personally have the problem of plants not matching style or layout
- There is a place for every plant. You just need to find the right place. The AR app should instead show you where to place your plants.
- "Not something I'd really need but interesting."
- The size is not really a problem because they only buy small plants. The main problem is that it is hard to estimate the amount of light indoor. Her plants always die of lack of light.
- (Older people) Never encountered trouble with size of plant when they are bought, but they do encounter problems as the plant would eventually grow larger than expected, or it reproduces into multiple pots of plants, way more than needed.
- Maybe there's a way to see how my whole yard would be transformed with AR? Would they have info on my yard from google maps, etc.?
- Works well for bigger plant, succulents are small. Growth potential, how big will they get?
- Can we show the future state of the plant over time?
- Style - I visualize in my head already so it's not a problem.  
As a smaller person, weight is very important info.

# LOW-FI PROTOTYPE



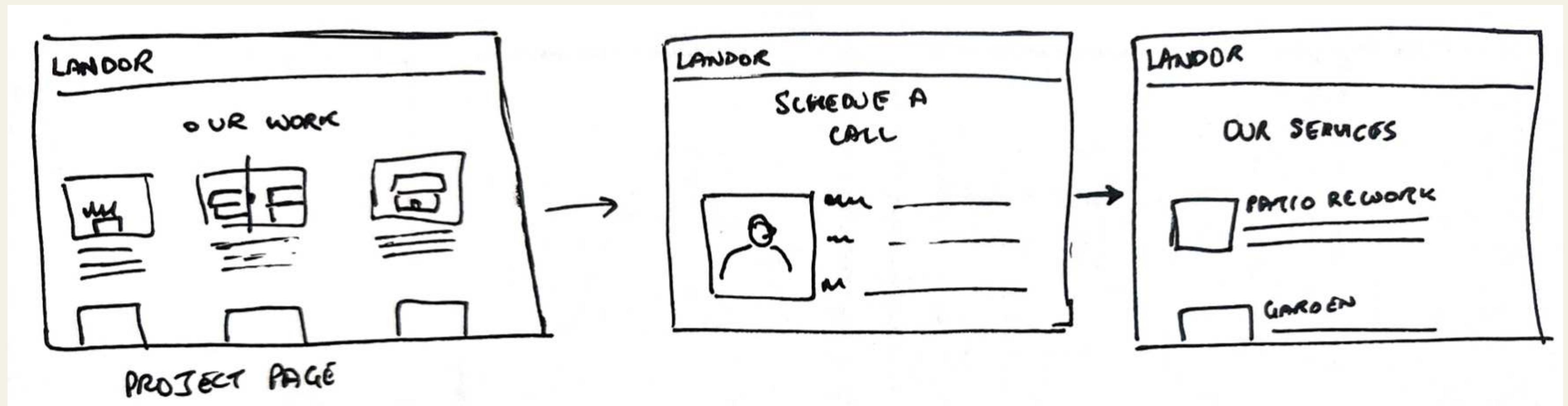
## STORYBOARD #2



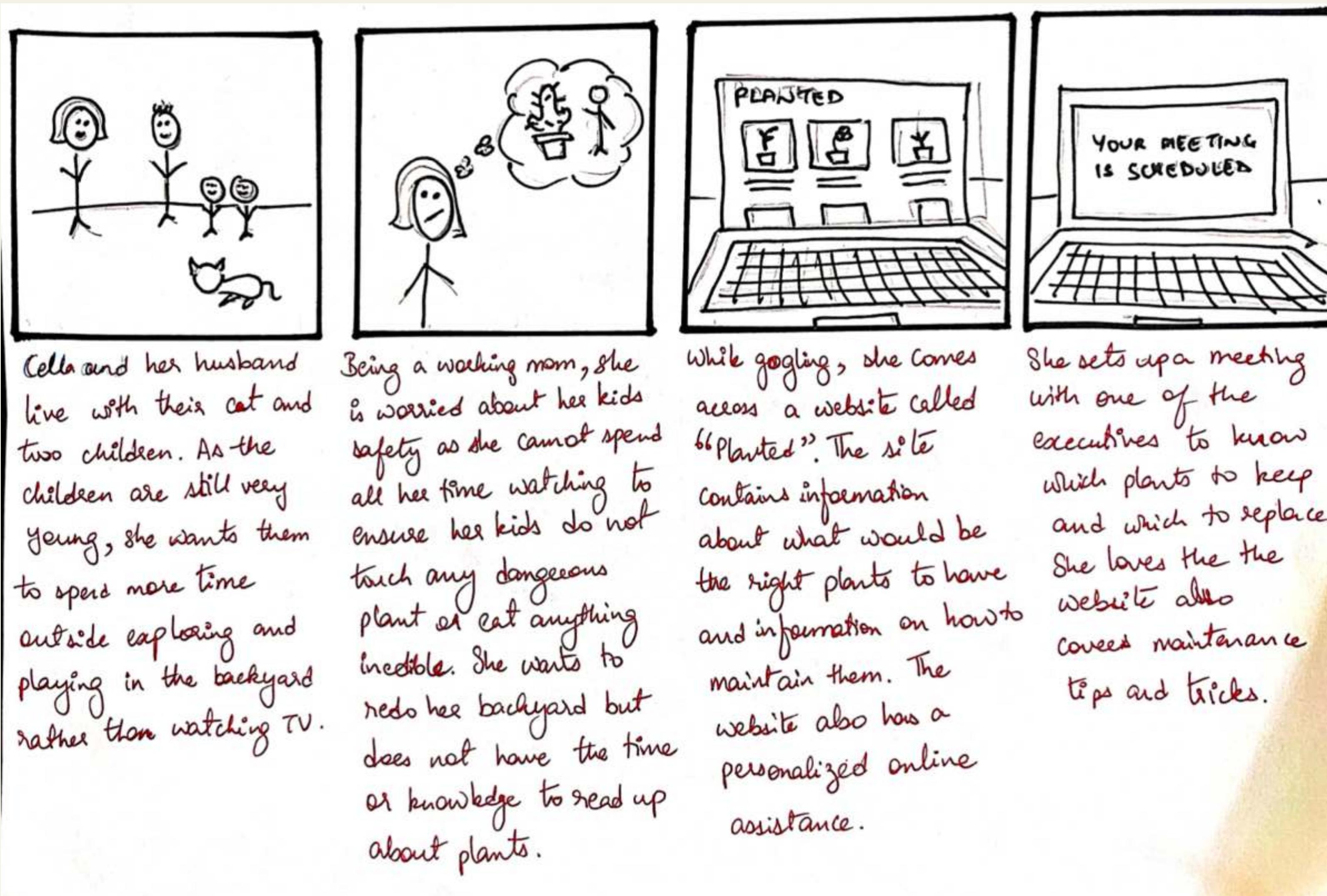
# STORYBOARD #2 - Speed Dating Comments

- The website should show the projects, reviews, before after images, that would be useful.  
Should be able to see sketches of the plan and price they paid for it
- “I could just use Yelp instead of this. I can message the owner through Yelp if I have questions. I wouldn’t go to a new app or service for this.”
- Underwhelmed, this exists already.
- I’d like to see the portfolio before spending money.
- Not just the look matters but also the environmental impact - e.g. drought in California.

# LOW-FI PROTOTYPE



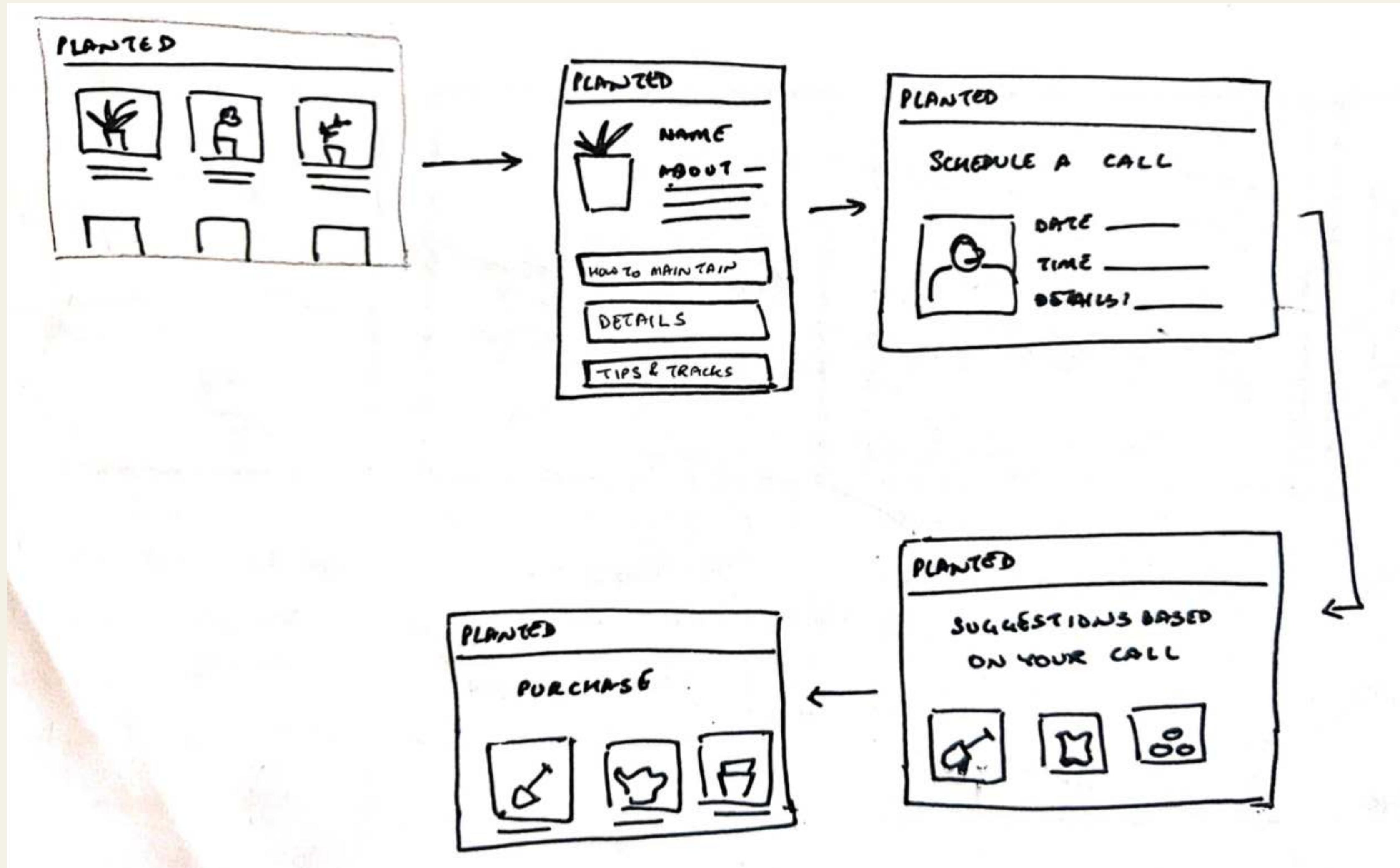
## STORYBOARD #3



# STORYBOARD #3 - Speed Dating Comments

- Zoom is not useful because all info is available online. I would rather have someone come in and fix my plants once in a while.
- “I really like the idea! As long as it does keep my plants alive!”
- Second person said sick plant zoom conference would be helpful.
- How do I know what plants I already have? (species, names, etc.)
- Is there a feature that would identify my plant?
- Pets are a problem so this is definitely a need. Not sure if kids would actually eat the plants.
- Sick plants are common and frustrating.
- (Older people) “Sounds like a very attractive idea.” The other person points out it is similar to Home Depot. And they would rather go to Home Depot in-person.

# LOW-FI PROTOTYPE



## STORYBOARD #4



Michael is a PHD student from LA who recently moved to Pittsburgh to study at Carnegie Mellon University. He has rented a house at Pittsburgh.



Upon moving in, he realizes that his yard needs a bit of mowing and weeding. However, he knows no one in Pittsburgh who does the service and he is too busy with his academic research to do these things himself.



Feeling helpless, he goes online to look for any help he can find. He comes across an app called *LawnRabbit*, which offers a wide range of landscaping services and shows reviews of available workers he could hire.

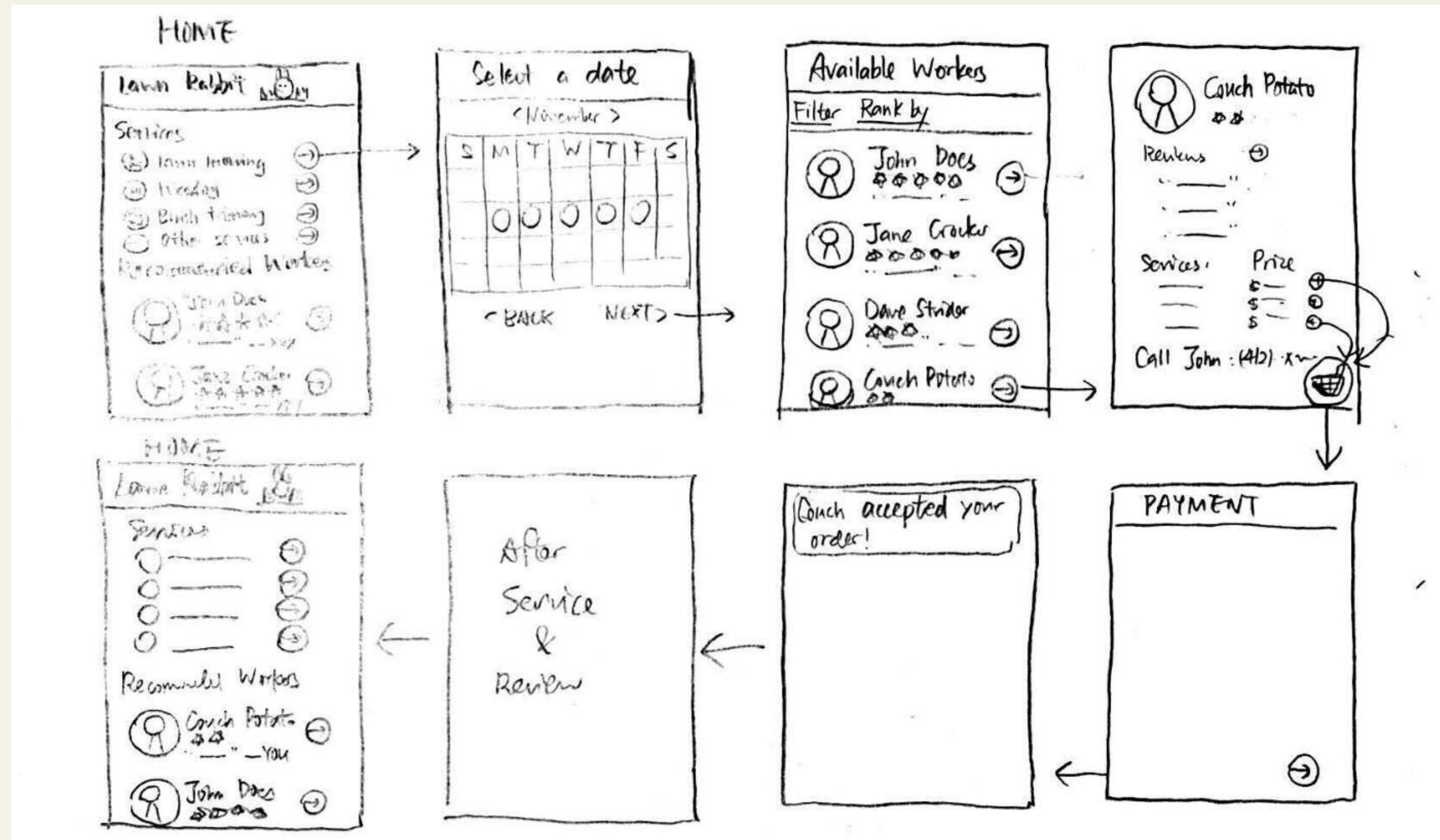


He schedules an appointment with a worker who offers the service he needs and has high rating. He is happy with the service and decides to hire the person to mow his lawn regularly.

# STORYBOARD #4 - Speed Dating Comments

- We use a similar service, where we have a person on contract who comes every month to remove the weeds and mow the lawn.
- Two needs here - danger concerns and then maintenance.
- When asked whether they would be willing to download an app for maintaining plants, the older people said they would not because they prefer going in-person to the Home Depot. The shop doesn't provide any plant insurance service but the staff there are friendly and always happy to take a look at their plants for them. They could buy pest killers and fertilizers directly from there, too. It feels much better and trustworthy than asking someone and purchasing online.
- The college student is happy to download an app. They think the plant insurance idea sounds attractive. She is very frustrated that her plants still die even when she follows instructions strictly. It would be great if the app can hold accountability for her plant. She would also feel very accomplished if she can actually keep her plant alive.

# LOW-FI PROTOTYPE



## STORYBOARD #5



Samantha and Eve are a young couple who just purchased their first house in Pittsburgh. They don't have huge budget and neither has any experience in gardening, but they are excited to furnish their first garden.



While they are researching, they were frustrated that most landscaping service websites online do not show their prices for the services they order, which makes it hard for them to compare prices or set up budget.



Luckily, they find the Sestili Nursery website, which displays their past projects and the corresponding price breakdown. Even better, they also have a service price estimator which calculates the budget given the dimensions of the garden, the type of construction materials, etc.

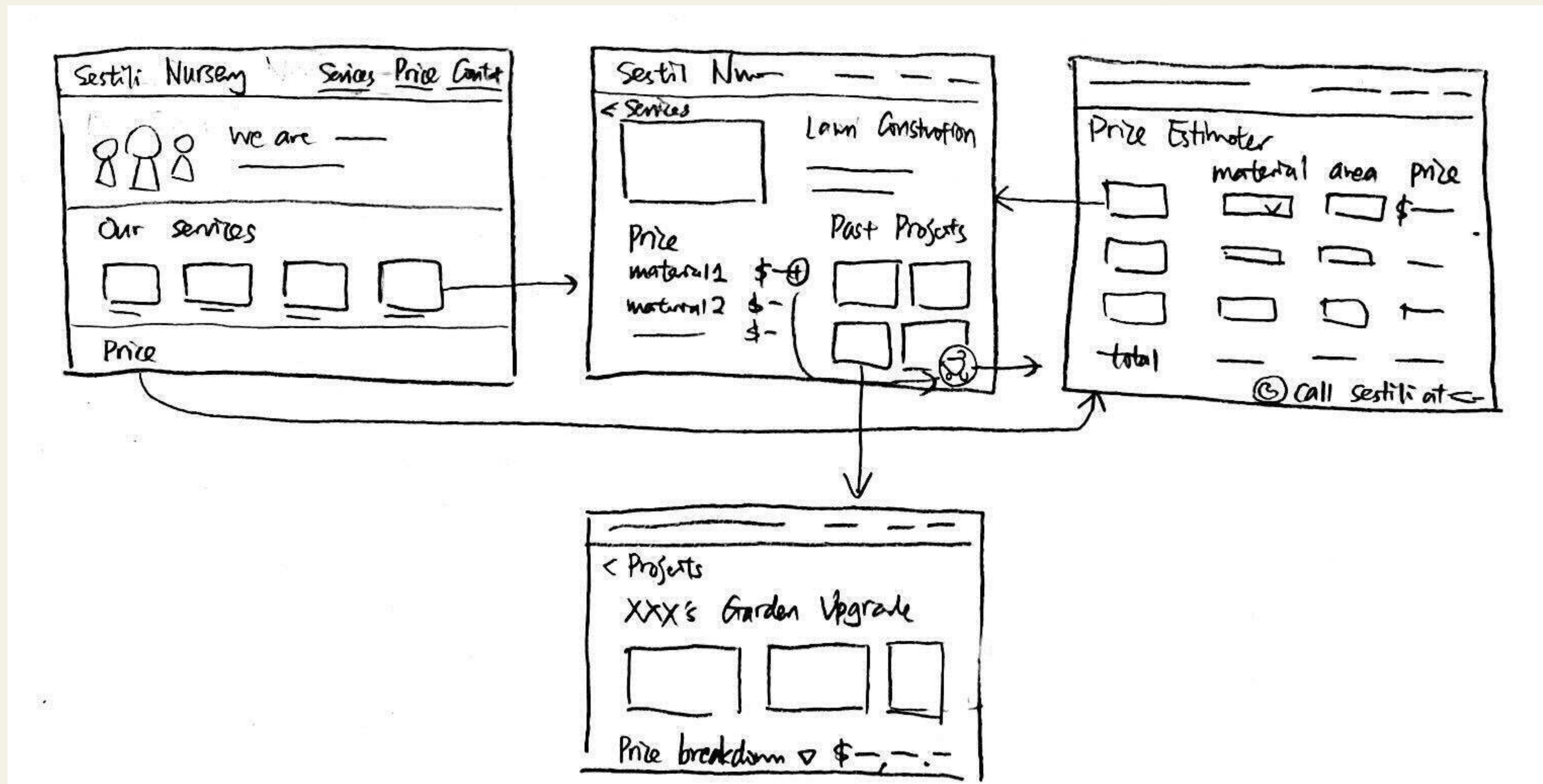


Samantha and Eve immediately decided to stick with Sestili Nursery because they don't want to bother with researching the less convenient landscaping websites anymore. Also, the company seems really trustworthy with the transparent price breakdown.

# STORYBOARD #5 - Speed Dating Comments

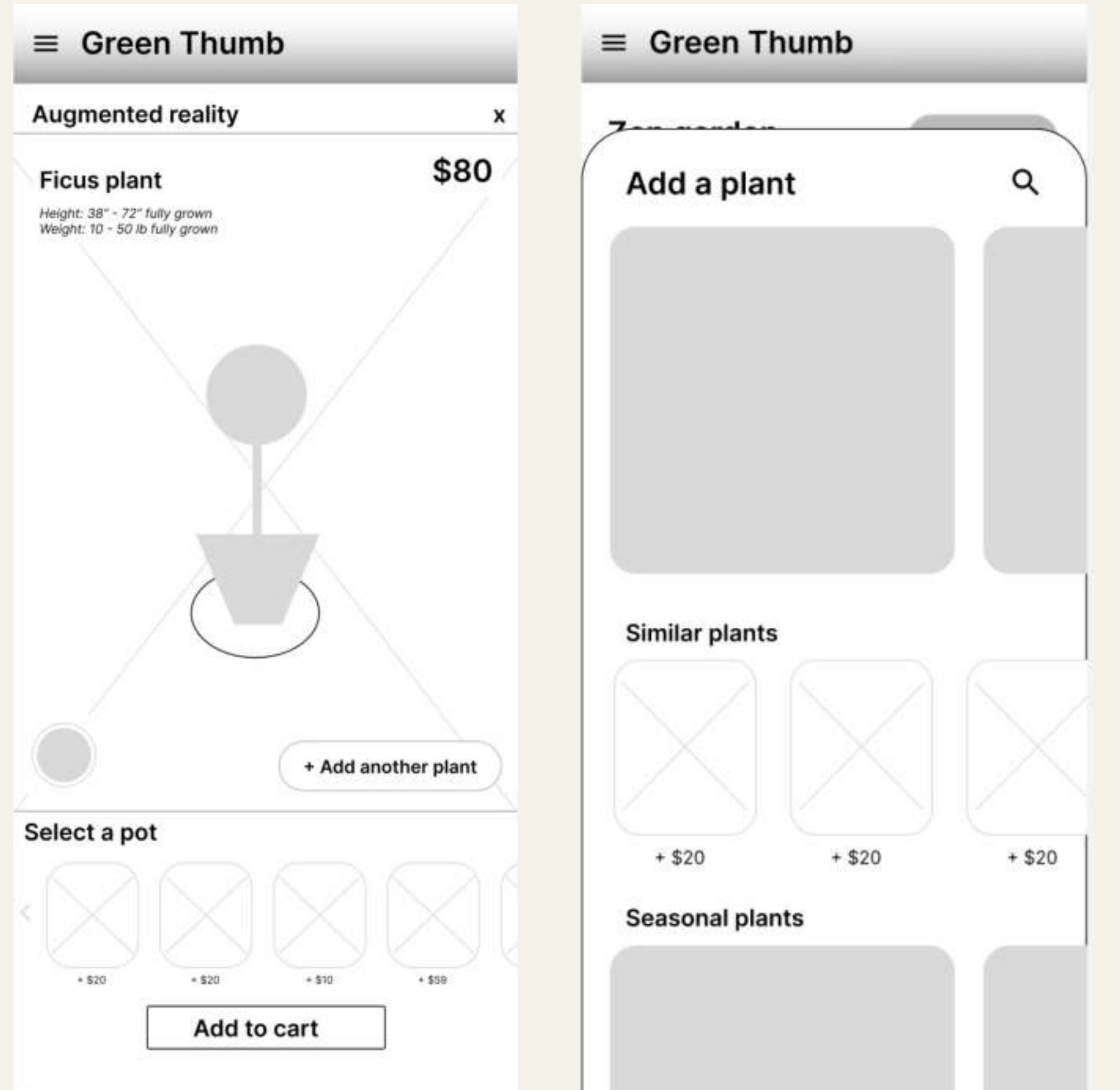
- There should be a service where I could put out my requirements and companies contact me with their quotes.
- This seems good for the customers but not the business owner or service provider.
- This is good. I like the transparency. I'd want to know the full price breakdown - plant cost, service and labor cost, etc.
- I had a similar experience trying to find someone to repair my house. I based it on price alone, not necessarily quality. It depends if it's something visual that people will see or just functional. Complexity also matters.
- When I hired landscapers for my parent's yard it was through word of mouth.
- We went and checked out the work they did and made sure it was suitable for our needs and wants.

# LOW-FI PROTOTYPE



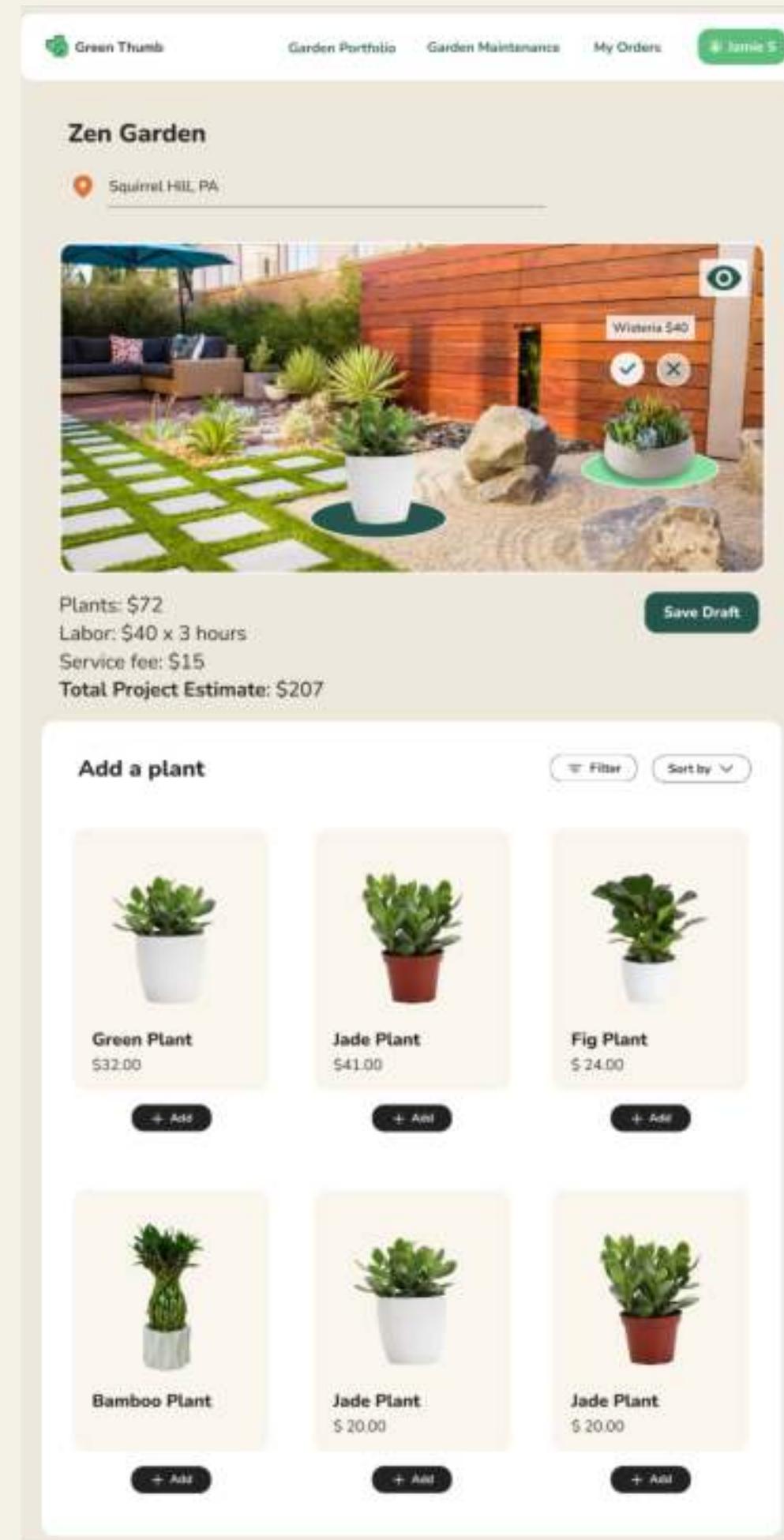
## Appendix: Design Iterations

# Appendix: Design Iterations - Lo-fi Prototype



[Link to low-fi wireframes](#)

# Appendix: Design Iterations - Garden Creator Screens



These screens evolved after receiving critique from Dan Saffer. We reconsidered the space and the actions we were making our users take. The final iteration features a collapsible side drawer that allows direct manipulation of elements in context, rather than having to scroll laboriously back and forth. This design reflects the heuristic, "recognition over recall" because we are not forcing our users to remember either the garden layout or the plants. Users can now view them both as needed simultaneously.

[Link to 3 Garden Creator Iterations prototypes](#)

## Appendix: Pitch Slides

# Green Thumb

# Personas



Ron Sestili

**Business owner (Sestilli founder)**



Paul Sestili

**Service provider**



Joe Bisham

**Repeat customer**



Samantha Ridge

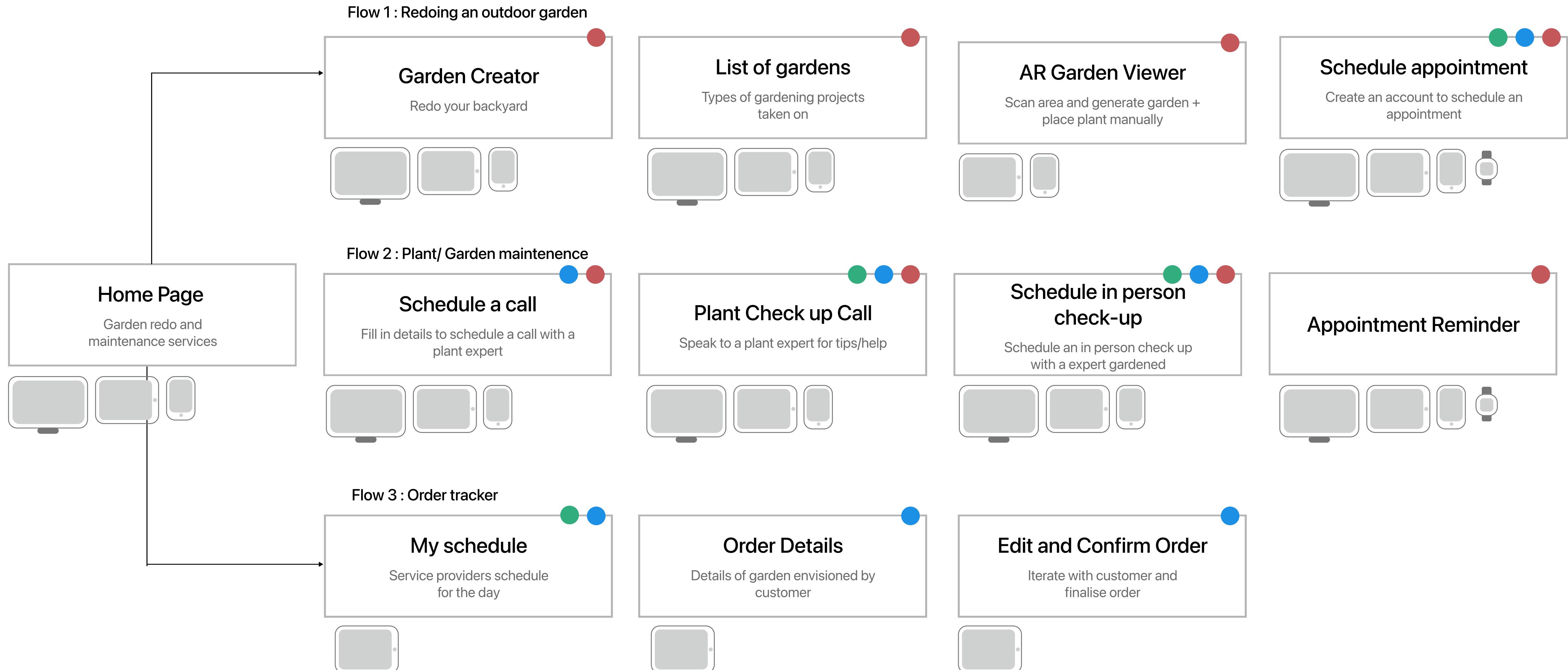
**First-time customer**



# Observed Pain Points

1. Difficulty faced by customers to visualise
2. Customer expectation setting
3. Business owner understanding customer desires
4. Information centralisation for service provider

# Value Map



● Customer

● Service Provider

● Business Owner

# Thank you