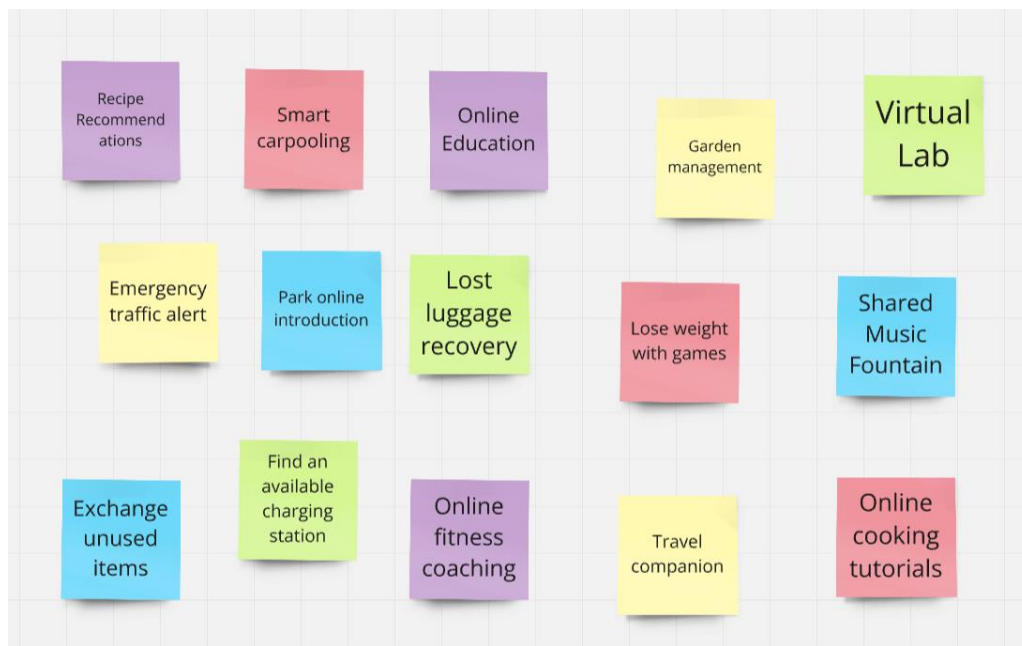


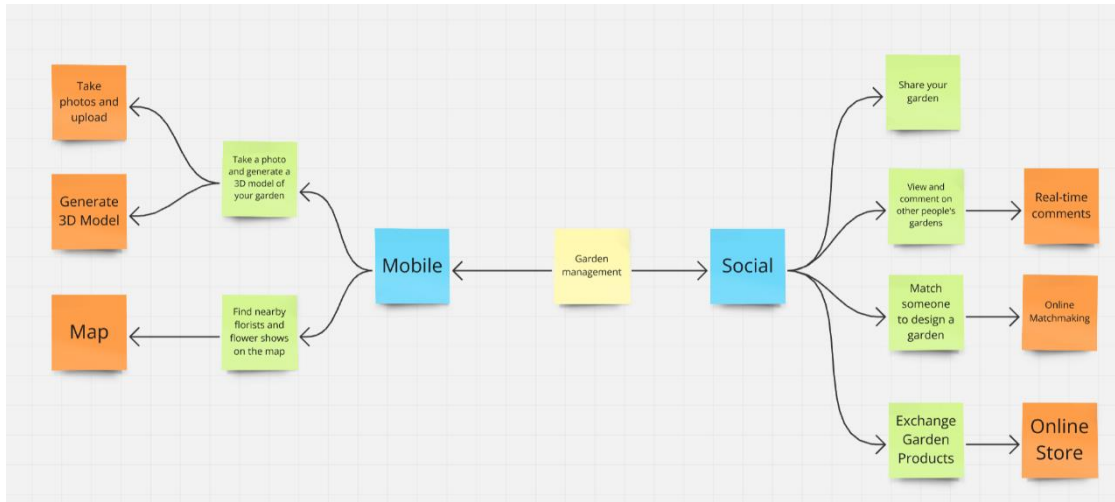
Ongoing Documentation of Work

During this semester, we conducted research on the Local Garden Management domain and implemented the **Garden Craft** garden management project. Throughout this project, we faced many challenges, but we eventually completed it successfully. Below is a record of our ongoing work throughout the semester.

1. At the beginning of the semester, after finishing our individual assignments and forming a team, we started selecting our domain and topic. Initially, we chose remote education as the topic because both Jiyuan Zhu and I have a background in communication studies. We also considered the travel domain, attempting to create an app that matches like-minded people for trips. However, we ultimately decided to focus on something more relevant to our surroundings. After some in-depth brainstorming, we confirmed our topic as #Local Garden Management.



2. After confirming the topic, we immediately began deeper research and brainstorming, thinking about what kinds of features and concepts we should include. With the #Local Garden Management theme already set, we started considering the specific concepts for the project. We came up with many creative ideas, such as a smart irrigation system that adjusts watering frequency based on weather forecasts and plant needs, or a feature where users can upload photos to identify weeds or plant species. However, these ideas were rejected due to technical limitations. Later, by integrating the social and mobile aspects, we finalized our main direction—a smart garden management system.



3. After determining the direction, we conducted a series of literature reviews and user research. The literature review provided us with some technical inspiration: it highlighted several key technologies in landscape design, such as virtual reality (VR) for improving design comprehension, GIS and multi-sensor technology for terrain and ecological assessments, and 3D modeling to digitize the design process. Additionally, multi-user VR simulation systems and collaborative applications facilitate team design. We also conducted user research, including interviews, probes, observations, and focus groups. The conclusion we reached is that we need to create a smart garden management app with integrated social features to help users collaborate effectively. Together, the findings from the literature and user research served as the theoretical foundation for our project.

Garden management

- Virtual reality and 3D simulation technology applications:** The paper "Virtual Reality Design and Implementation of Interactive Garden Landscapes" demonstrates the application of virtual reality technology in garden landscape design, emphasizing the importance of 3D models and real-time rendering. The study uses the OpenSceneGraph graphics rendering engine to visualize 3D landscape models and parameter control of spatial layouts, which provides users with an interactive 3D scene browsing experience that is very suitable for your platform.
- GIS and multi-sensor technology:** In the paper "Application of GIS and multi sensor technology in green urban garden landscape design," GIS technology is used for data query and analysis, terrain analysis, hydrological analysis, etc. These technologies can help users to process and display geographic information more accurately when designing gardens, thereby improving the accuracy and practicality of the design.
- Three-dimensional simulated garden landscape design method:** The paper "Three-dimensional simulated garden landscape design method based on virtual simulation technology" studies the combination of virtual simulation technology and the traditional "three-dimensional" simulated garden landscape design method. By constructing a three-dimensional garden landscape simulation system, the accuracy of the design method is improved, which provides technical support for designing more detailed and vivid garden landscapes.

There are three related technologies in garden design:

Figure 1 Literature Review

Diary Probe 1: Li Qing's Workday Journal

Date: September 13, 2024 (Weekday)

Garden Status: Balcony Garden

Morning

I like most mornings, I only had a few minutes to check on my plants before heading out. The weather has been a bit dry lately, so I quickly gave them some water. I really wish I had a feature that could remind me when to water each plant, especially since they all have different needs. For someone like me, who's always short on time, this would be super helpful.

Noon

I had a little free time at work, so I looked up some tips on caring for potted plants.

Evening

I got home pretty late and didn't have much energy to work on my garden. But I still took a moment to snap a picture of my gardenia, which is about to bloom. I want to share it with my friends.

Diary Probe 2: Li Qing's Weekend Journal

Date: September 16, 2024 (Weekend)

Garden Status: Balcony Garden

Figure 2 Focus Group

Exploratory Observation

1. Observation Facts:

You will observe how Linda, Clady, and Sandra manage their local gardens without digital tools. Focus on:

- How they plan garden layouts.
- Their methods for collaboration (if they have).
- How they source or find local gardening resources.

2. Task Objective:

- Document the challenges they encounter during the planning and management stages.
- Identify any unmet needs or inefficiencies in their current process.

2. Observation Process

Linda's Observation

Linda manages her garden layouts by sketching them in a notebook and imagining different designs, but this method limits her ability to experiment visually. She tends to work alone, mostly seeking input from others. For resources, she primarily visits local garden stores, but she often faces difficulty finding specialized tools or plants she needs. Linda feels that better planning tools would help her explore new ideas and improve her gardening process.

Figure 3 Observation

Diary Probe 1: Li Qing's Workday Journal
Date: September 13, 2024 (Weekday)
Garden Status: Balcony Garden

Morning

Like most mornings, I only had a few minutes to check on my plants before heading out. The weather has been a bit dry lately, so I quickly gave them some water. I really wish I had a feature that could remind me when to water each plant, especially since they all have different needs. For someone like me, who's always short on time, this would be super helpful.

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Diary Probe 2: Li Qing's Weekend Journal
Date: September 16, 2024 (Weekend)
Garden Status: Balcony Garden

Figure 4 Probe Research

4. After the preliminary research, we established several design concepts: users can upload garden photos and attract comments from others (Social), collaborate with others on garden design and management (Social), use location data to recommend nearby stores selling garden tools (Mobile), generate 3D simulated gardens based on photos (integrating Unity 3D modeling) (Social and Mobile), and create a garden marketplace for exchanging or selling garden products within the community (Social). Based on these concepts, we developed low-fidelity sketches and mid-fidelity prototypes.

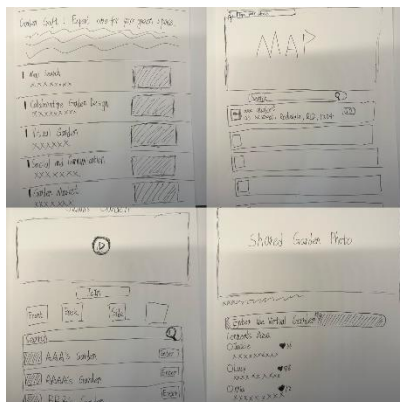


Figure 4 Low-Sketches



Figure 5 Mid-Fi Prototype

5. After completing the foundational preliminary work, we held our first Stand-Up meeting and received valuable feedback from the teaching team:

- (1) Consider the factors that make the design effective, meaningful, and practical.

(2) Approach the design from a mobile computing perspective, considering how it relates to specific locations or location awareness.

(3) Focus not only on developing a solution or application but also on its real-world application scenarios.

We decided to implement the following actions in our subsequent work: In the coming period, our team plans to complete the drawing of high-fidelity prototypes, conduct user testing of high-fidelity prototypes, adjust and modify functions, make actual web pages, conduct user testing of web pages, and make final functional adjustments.

6. After the first Stand-Up meeting, we began creating high-fidelity prototypes and developing the final website. Once the high-fidelity prototype was completed, due to time and technical constraints, and following a suggestion from our tutor, we decided to discard the garden marketplace feature as it didn't strictly belong to the social functionality. We then conducted user testing and feasibility testing using our high-fidelity prototypes.

Our Final Project Link: https://k2222350743-e7923fb80adb.herokuapp.com/garden_page.html

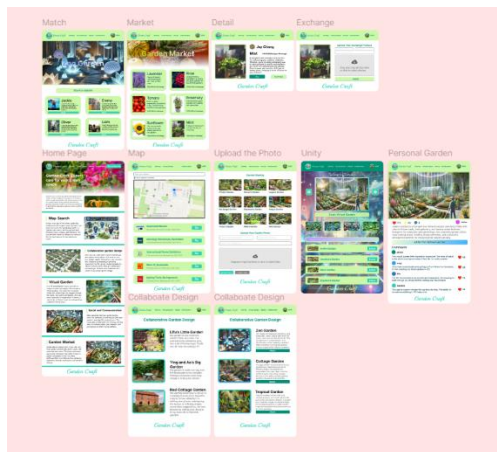


Figure 6 High-Fidelity Prototype

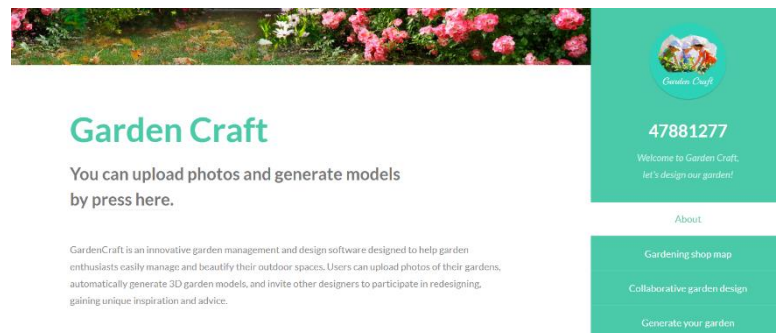


Figure 7 Website Screenshot

7. In the second Stand-Up meeting, the tutor mentioned the following points:

(1) A series of design activities must be completed to pass the assessment, including site observation and each team member conducting at least one interview.

(2) Since the project includes social features, it's important to consider how to apply social computing concepts and best practices.

(3) More methods to enhance the use of social computing and mobile computing should be considered.

(4) Meeting the requirements of all design activities is a key part of the course.

In the following period of time, we will complete user testing of the web page, supplement all necessary materials, complete the modification and optimization of the web page, and prepare the materials needed for the final trade show. After the web page was officially completed, we conducted another round of user feasibility testing and scenario simulation.

Usability Testing

1. Define Test Goals

Our goal is to evaluate the usability of the website's features, including photo uploads, 3D garden design, collaborative design, and the map function, as well as assess whether these features meet user needs. Additionally, we aim to test the practical applicability of our project to ensure it functions effectively in real-world scenarios.

2. Choose Target Users

I selected three target users: Linda, Cindy, and Sandra. They are my landlord and two neighbors, all of whom have experience in garden management. This made them ideal candidates to participate in this user survey.

3. User Tasks

- (1) Browse and explore the website.
- (2) Try using the map feature to search for garden-related locations nearby.
- (3) Engage in Collaborative Garden Design.
- (4) Experience the 3D Virtual Garden Design tool.
- (5) Attempt to upload garden photos and interact with other users' comments.

Figure 8 Usability Testing

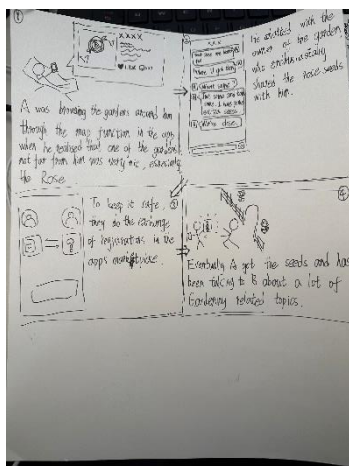


Figure 10 Scenario

SCENARIO

User Lisa has just moved into a new house and is looking for a way to manage her garden. She has a lot of experience in garden management and is looking for a way to share her knowledge with others. She has heard about a website called 'Garden Design' and is interested in trying it out. She has a lot of photos of her garden and is looking for a way to share them with others. She has also heard about a 3D garden design tool and is interested in trying it out. She has a lot of experience in garden management and is looking for a way to share her knowledge with others. She has heard about a website called 'Garden Design' and is interested in trying it out. She has a lot of photos of her garden and is looking for a way to share them with others. She has also heard about a 3D garden design tool and is interested in trying it out.

Figure 9 Scenario

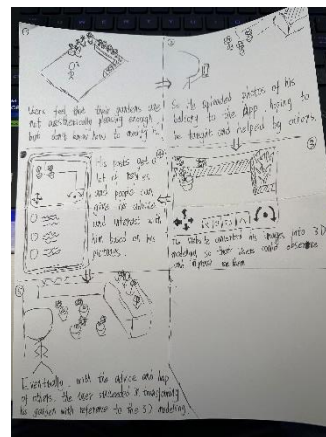


Figure 11 Scenario

8. By Week 12, we had prepared our poster and promotional materials and began the Trade Show, where we received feedback from both teachers and classmates.