Amy Giuntini
Brianna King
Chris Whitmire
Gina Colombo
Wesley Wittekiend

Dawg Bots Milestone 4

Introduction

With the creation of our prototype, we had the intention of targeting the application for college students. To Summarize, My Goal Garden was to created to help users keep up with their goals. The user will be required to add a goal, represented by a plant. The plant will grow when a user stays on track to accomplish their goal. We decided college aged students would be more likely to use the app consistently. With this in mind, we conducted our evaluations through feedback and testing with college students. In addition, we conducted a heuristic evaluation, cognitive walkthrough, and a KSLM analysis to establish the tasks we wanted our feedback groups to do. We had 10 users test our prototype. One group simply interacted with the app and went through our task goals. The second group participated in a think aloud evaluation. Both groups were asked about their experience and asked to complete a google survey. All 10 completed the same google survey.

Evaluation Protocols

Heuristic Evaluation

For our Heuristic Evaluation, we reached out to previous students who have taken the Human-Computer Interaction course and are now working in the STEM field and specialize in design (iOS design, Android, Web Programming, and so on). These alumni served as our “experts” for this analysis. We began our evaluation by first giving a briefing session to give our users more detail on what our application is intended to do. Secondly, we gave them more detailed instructions following the tasks mentioned in the task description section. We then allowed the “expert” users to evaluate our application for about an hour. They evaluated against the following heuristics with emphasis in the sub-points:

1. Visibility of system status
    a. Keeping users informed about what is going on
2. Match between system and the real world
    a. No computer terminology
    b. Appropriate error messages

3. User control and freedom
    a. Easy to abort; cancel buttons
4. Consistency and standards
    a. Actions consistently have the same outcome
5. Error prevention
    a. Eliminate error prone conditions
    b. Limit user input to appropriate format
6. Recognition rather than recall
    a. Make objects, actions, and options visible
    b. Make instructions visible or easily retrievable
7. Flexibility and efficiency of use
    a. Allow users to customize options
8. Aesthetic and minimalist design
    a. Exclude irrelevant details
9. Help users recognize, diagnose, and recover from errors
    a. Error messages should be in plain language, state the error, and suggest a solution
10. Provide suitable help and documentation
    a. Provided documentation is easy to search and find

From the evaluations based on these heuristics, we discovered a significant issue with visibility of system status. After saving a new goal, there is no message to tell the user that the goal has been saved. Similarly, if the user answers ‘no’ to the question ‘Did you complete the goal today?’, then nothing happens. The question remains and the system does not indicate to the user that it has received their response. These functions are integral to the application, and users will encounter this every time they add a new goal and every time they are prompted with the question ‘Did you complete the goal today?’. This issue does not affect the functionality of the app but can cause some confusion, so this was given a severity rating of 3.

Aside from this issue, the app did well according to the other heuristics. There is a match between the system and the real world because no jargon is used and instructions are straightforward. The user has control and freedom. They have the option to return to the home screen at all times and can abort actions. The app design has consistency and standards; actions have predictable outcomes. For recognition rather than recall, the app is not too taxing on the user’s memory load. Each screen is labeled at the top so the user does not have to remember where they are within the app. When the user opens a goal, the specific goal name is shown on the screen along with information about that goal. The app has a minimalist design with no extraneous

details or unnecessary distracting graphics. At this stage, the app does not have any error messages because the user input is limited to the correct format. If the user wishes to read the documentation, they can easily find it in the ‘About’ page in the ‘Settings’ tab.

Cognitive Walkthrough

Our team completed a cognitive walkthrough in order to understand the app’s usability and how it can be learned by new users. For this evaluation, we completed the four tasks from the perspective of a user who is not familiar with the app and its functions. For each task and subtask, we asked the following questions:

- Will the user aim to achieve the intended outcome?
- Will the user notice the necessary action is available to them?
- Can any available options or features of the design layout be confusing to a user?
- Will the user associate the correct action with the intended outcome?
- If the user chooses the correct action, will they see they have made progress towards the goal?
- If they make an error, will they recognize the error and correct it?

The tables below outline the subtasks for each task we are evaluating as well as the corresponding evaluation from the cognitive walkthrough questions.

Task 1: Adding a new goal

Subtask	**Cognitive Walkthrough**
1. Click ‘Begin’	There are no other options. It will be clear to the user that this is the action they need to take.

2. Select the '+' to add new goal.	The correct button is a commonly recognized symbol to add something new, and users who are familiar with any apps and even many who do not will recognize this to be the correct option. It is clear that when this button is chosen, the next screen will to be add a new goal. The button is not labeled, so someone who is not sure this is the correct option may scan for other options and realize that this is the one needed.
3. Type in goal name in 'Name' text field.	For some users this is very straightforward. However, a new user may think that it is asking for their name. In this case, they will still be able to create the goal but may realize they never specified what the goal is. They will likely recognize and be able to correct the error at this point.
4. Select flower color from options.	This task is not necessary in achieving the main goal and is merely reflecting the user's preference. It is an unambiguous option on the screen and will not cause any confusion.
5. Select number of days to reach the goal from '# of days' option.	This option is unambiguous to users who have a general understanding of what the app does. For a new user, they may not understand what this function does. However, after interacting with the app and seeing its purpose, this should be clear, and if they made an error with this choice, the user can correct it.
6. Select a reminder time.	Again, this option will be unambiguous to users. Even new users will understand what they are selecting.
7. Click 'yes' under 'Save new goal?'.	The question is very straightforward and it is obvious to the user that this is the action they need to take to reach the intended goal.

8. Answer ‘yes’ (or ‘no’) under ‘Goal completed today?’.	The user will understand that their goal has been saved and they should now answer this question with their honest answer in order to proceed.
9. Select ‘garden’ from bottom menu.	The task is completed, but there is no screen or message that indicates that to the user. The question remains on the screen, so the user might think that it is not working. They must navigate away from the screen via the bottom menu, but that may not be intuitive and may only happen after the user thinks the function didn’t work.

Task 2: Say you made progress on ‘Cook Healthy Dinner’ goal

Subtask	**Cognitive Walkthrough**
1. Click ‘Make healthy dinner’ goal.	With this specific goal in mind, it is clear to the user that this is the correct action. The user will likely correctly predict that this will allow them to input whether or not they completed the goal.
2. Select ‘yes’ under ‘Goal completed today?’	The question and answer are unambiguous, and it’s clear the answer is needed to complete the task.
3. Select ‘garden’ from bottom menu.	After selecting yes, the user will see their plant grow and the task has been completed. However, there is no message and the question remains on the screen. The user must navigate away using the bottom menu, and may not realize that this is the correct action.

Task 3: Say you did not make progress with the goal ‘Do Yoga’

Subtask	**Cognitive Walkthrough**

1. Click ‘Do Yoga’ goal.	With this specific goal in mind, it is clear to the user that this is the correct action. The user will likely correctly predict that this will allow them to input whether or not they completed the goal.
2. Select ‘no’ under ‘Goal completed today?’	The question and answer are unambiguous, and answering this question to complete the task is straightforward.
3. Select ‘garden’ from bottom menu.	Nothing happens on the screen, and there is no indication the task is completed. There is no message and the question remains on the screen. The user must navigate away using the bottom menu, and may not realize that this is the correct action.

Task 4: Look at the completed goal “Write in my Journal”

Subtask	**Cognitive Walkthrough**
1. Select ‘Completed’ from bottom menu.	The new user may have to scan the screen to consider all of the options. Their first intuition may be that the completed goal is on the goals screen. However, when they see the completed option with the check mark graphic, it is clear that this is the correct action. The user will be able to predict that this button will take them to a screen where they can view their completed goals.
2. Select ‘Write in my journal’ goal.	It is evident to a user that this is the correct action to take. The user will correctly predict that this will take them to a screen to view this particular goal.
3. Navigate back to ‘garden’ from bottom menu.	It is clear to the user that they have viewed the intended goal. As there are no questions or options on this screen, the user will see they should navigate away via the bottom menu.

From the cognitive walkthrough, we determined there is one severe issue with the design that can be extremely confusing for users. When the user is asked if they completed the goal today, the question remains on the screen regardless of the answer and no message indicates that their answer has been saved. When adding a new goal, a message should be shown to the user that the new goal has been saved. When they complete a goal for a day, the app should convey this by text to the user as well as having the plant grow, and the question 'Goal completed today?' should no longer be visible. When they don't complete the day's goal, this should also display a message and remove the question so that the user is aware the app is functioning as intended.

Predictive Evaluation

A KSLM analysis was done for all of the tasks that the users were asked to do. The KSLM analysis was done by one of the designers by opening up the application and doing each of the tasks. While doing each task, the designer recorded the operators that corresponded to what they were doing. Then, after doing each task and recording the operators, the designer found the time corresponding with each operator and summed up those times for each task. The operators and total times are shown below.

Task 1- Adding a new goal

1. H- home hands over the mouse/mobile device
2. P, P1 - move to and click on the '+' button
3. P, P1- move to and click on 'Name'
4. P, P1- move to and click on 'Flower Color'
5. P, P1- move to and click on '# of Days'
6. P, P1- move to and click on 'Reminder Time'
7. P, P1- move to and click on 'Yes'
8. P, P1- move to and click on 'Garden'

Total time = 9.5s

Task 2- Say you made progress on 'Cook Healthy Dinner' goal

1. H- home hands over the mouse/mobile device
2. P, P1- move to and click on 'Cook Healthy Dinner'
3. P, P1- move to and click on 'Yes'
4. M- watch as plant grows
5. P, P1- move to and click on 'Garden'

Total time = 5.65s

Task 3- Say you did not make progress with the goal ‘Do Yoga’

1. H-home hands over the mouse/mobile device
2. P, P1- move to and click on ‘Do Yoga’
3. P, P1- move to and click on ‘No’
4. M- watch as plant does not grow
5. P, P1- move to and click on ‘Garden’

Total time = 5.65s

Task 4- Look at the completed goal “Write in my Journal”

1. H- home hands over the mouse/mobile device
2. P, P1- move to and click on ‘Completed’
3. P, P1- move to and click on ‘Write Journal’
4. P, P1- move to and click on ‘Garden’

Total time = 4.3s

Retrospective Testing

For the retrospective testing, we had 5 users interact with the prototype. They were given the 4 tasks listed above and asked to complete them. For the most part, the users had no trouble. Afterwards, the were interviewed with the questions from the questionnaire. The main conversation was surrounding what they liked and disliked about the prototype. For all five of the users, they enjoyed the concept of the application. The most disliked aspect was that they found it a little confusing to figure out how to navigate once the first step was done. They did not know that they had to go back to the garden page right away and attempted to save the goal, assuming it would go back to the garden page. This is something we could have inferred and added to the functionality of our prototype. However, we now know how important this will be in the final product, since most users were confused. After a short discussion of their feelings using the application, we had the users participate in our google survey. The results of these responses, as well as the responses from the think aloud evaluation are included in the results section.

Think Aloud Evaluation

For our Think Aloud evaluation, we gathered 5 users. First, we performed a standard think aloud procedure with the first 3 users individually. Secondly, we performed an alternative think aloud procedure by having the other 2 users do the tasks together and encouraging them to discuss what they are thinking as they go through it. All users represented a different group of people that may use our application. To

elaborate, the first 2 users were students aged between 18 - 22, the 3rd user was a full-time working businessman aged between 23-26, the fourth user was a middle-aged working mother aged between 55 - 60, and the last user was a remote worker in the insurance industry aged between 28 - 32. We created a script and first introduced ourselves as follows:

"Hi, (user's name). My name is (group member), and I'm going to be walking you through our session. Before we begin, I'd like you to know more about what we're doing here. We're looking for people to try using a mobile application we've created to see whether or not it works as intended."

As the users participated and during our introduction, we emphasized that the purpose of the activity was strictly to evaluate the system and not the user themselves. None of the participants got upset or frustrated and no harm was inflicted on the users. Before we began asking the users to perform tasks, we first asked a few general questions to gather more background data. Keep in mind we already knew the occupation of the users, so we asked the following:

- How many hours a day would you say you spend on your mobile device?
- How many hours a week, roughly, would you say you spend using mobile applications?
- What kind of applications do you use when you are using mobile applications?
- Do you have any favorite applications?

Once we had some general answers, we began by asking the user to simply look at the page and tell us what they thought of it: if they liked the layout, the color scheme, what you could do, and what the purpose of the application was. We asked them to keep this in mind and remember their answers for the survey/questionnaire following. We then asked users and our user pair to complete a series of tasks and subtasks. Each part included a realistic scenario but required the user to do as stated in the "Task Descriptions" section. Upon completion, we thanked each user and pair of users and escorted them out. We included the results in the results section.

Questionnaire

After users completed the task list, we conducted short interviews. The questions were similar to this questionnaire, but with the ability to let the user describe their concerns a little more:

After using prototype please answer these questions:

1. What was the least enjoyable part of the application?
2. What was the most enjoyable?
3. Did you find it easy to figure out how to use?
4. On a scale of 1-5 (1 being never 5 being absolutely) how likely are you to use this application once it is finalized?
5. How would you describe your experience using the app?
    a. Great- no problems
    b. Okay- encountered a few problems
    c. Bad- a little confusing
    d. Awful- very confusing to use
6. Please rank in order 1 being least liked and 5 being most liked
    a. ____ the design of the application
    b. ____ the functions of the application
    c. ____ the concept of the application
    d. ____ the usefulness of the application
7. Suggestions

In addition, we conducted a google survey for all users.

1. What is your age?
2. What is your sex?
3. What is your level of experience with using mobile applications?
4. Have you ever made a specific goal for yourself and regularly worked to make progress on that goal?
5. For you, how difficult is it to make regular progress on goals you have set for yourself?
6. How much did you enjoy using the Goal Garden app? Focus on how enjoyable the experience was for you.
7. What was the highest level of frustration you felt while using the app?
8. How helpful do you think the app would be in helping you maintain your goals?
9. What is the likelihood of you using this app if it was freely available to you?
10. Would you recommend this app to a friend?
11. Think about when you stated that you made progress on a particular goal, and the plant grew. What kind of feeling did you have when you saw the plant grow?
12. Recall that if you did not make progress on your goals, the plant associated with that goal would wither and become unhealthy. How would you feel if a plant started to wither because you did not make progress on a goal?
13. Recall the "Goal Garden", the collection of flowering plants that represented completed goals. How did you feel when you saw these completed goals and the flowering plants?

14. What did you enjoy about using this app?
15. What did you not enjoy about this app?
16. Think about how you like to use apps in general. Please rank the following in order of what is more important to you using the app. 1 is least important and 5 is the most important.
    a. The app that is fun to use.
    b. The app that has a functional use.
    c. The app allows me to share content with others.
    d. The app allows me to live a healthier life.
    e. The app looks aesthetically pleasing.

Task Descriptions

All tasks start at “Garden” page of the app. This page is the home screen. The tasks that users tested in the different evaluations are listed below. Note that main tasks are numbered, while the subtasks the users would have to complete in order to accomplish a main task are alphabetized. The users testing our application were only given the main tasks, not the subtasks. Here are the tasks:

1. Add a new goal to the goal garden
    a. Click on ‘+’.
    b. Click on ‘Name’ and pretend to enter a name.
    c. Click on ’Flower Color’ and pretend to enter a color.
    d. Click on ‘# of Days’ and pretend to enter the number of days.
    e. Click on ‘Reminder Time’ and pretend to input the time in which they should be reminded to work on their goal.
    f. Click ‘Yes’ to save the goal.
    g. Go back to the home screen by clicking the ‘Garden’ button.
2. Go to the ‘Cook Healthy Dinner’ goal and say you made progress on that goal.
    a. Click on ‘Cook Healthy Dinner’ plant.
    b. Click ‘Yes’
    c. Return to the home screen by clicking the ‘Garden’ button.
3. Go to “Do Yoga’ goal and say you did not make progress on it.
    a. Click on ‘Do Yoga’ plant.
    b. Say ‘No’ to say you did not make progress.
    c. Return to the home screen by clicking the ‘Garden’ button.
4. Look at the “Write in my Journal” plant which is a completed goal.
    a. Click on “Completed”.
    b. Click on “Write in my Journal” Plant.
    c. Return to the home screen by clicking the ‘Garden’ button.

These tasks were chosen because a user could do all of these tasks in a small amount of time, and it would also allow us to test all of the components of our application. Task 1 asks the user to make a new goal. Since our application's main goal is to help users make and maintain progress toward their goals, it was critical that we evaluate the process for making new goals.

Furthermore, task 2, which requires the user to say they made progress on a goal, allows the user to experience what it is like to see their plant grow. We then asked the user about how this made them feel in the questionnaire. The same is true for task 3, which asks the user to say they did not make progress on their goal, resulting in the plant not growing and eventually withering. Evaluating the user's emotional reaction to the plant growing and not growing is essential for our design. This is because the positive feedback of the plant growing and the negative feedback of the plant not growing should motivate the user to make progress toward their goals, and if the users did not find this emotionally compelling, then we would need to change our design so that they would be more motivated to maintain progress toward their goal. So it was critical for us to have the users do tasks 2 and 3.

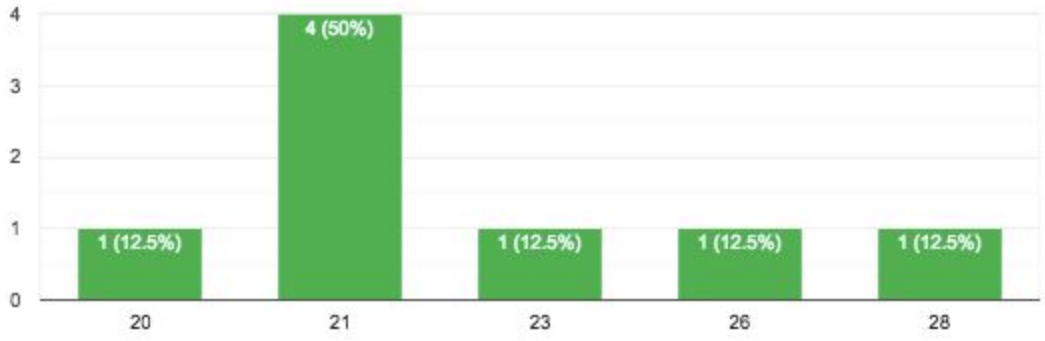
Task 4 allows the user to see the "Goal Garden", the collection of flowering plants representing completed goals. This was essential to test because it allows the user to understand what it is like to see a completed goal. We then collected data in the questionnaire regarding how this made them feel. Knowing what their emotional reaction is helps us understand whether or not our design is engaging and whether it will help user's accomplish their goals.

Demographics of Users

For the retrospective interview step we had a group of 5 students, mostly UGA seniors. The group was made up of 3 females and 2 males all between the ages of 20-22. For the think aloud testing we had a more diverse group. The first 2 users were students aged between 18 - 22, the 3rd user was a full-time working businessman aged between 23-26, the fourth user was a middle-aged working mother aged between 55 - 60, and the last user was a remote worker in the insurance industry aged between 28 - 32. Again, we wanted to focus on the student aged group since that is who we believe would be most likely to use the app. However, we did see importance in getting input from other groups of individuals. Also note that all the users tested either use mobile applications frequently on a daily basis or weekly basis. And all of the users had made goals and had worked regularly to make progress on it.

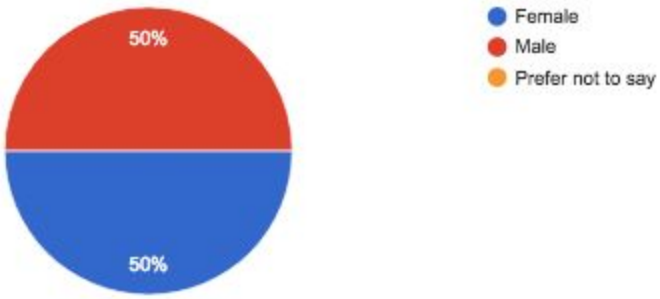
What is your age?

8 responses



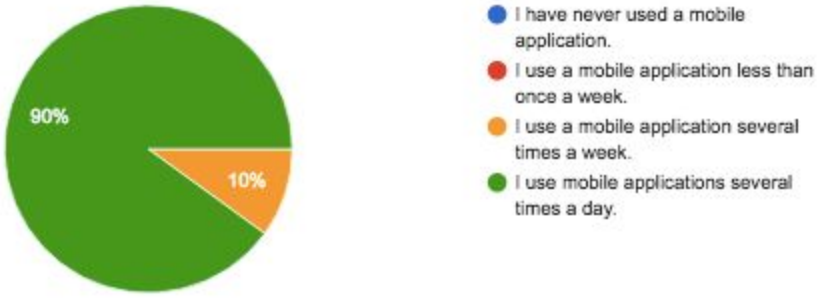
What is your sex?

10 responses



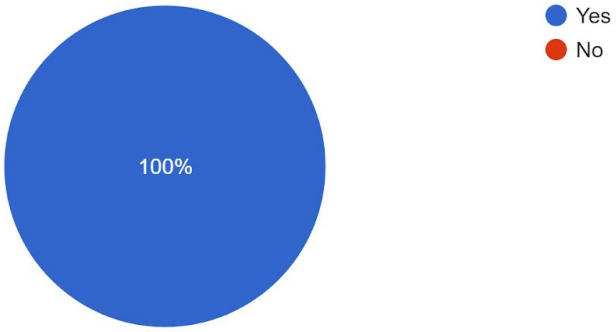
What is your level of experience with using mobile applications? Choose the answer that most applies to you.

10 responses



Have you ever made a specific goal for yourself and regularly worked to make progress on that goal?

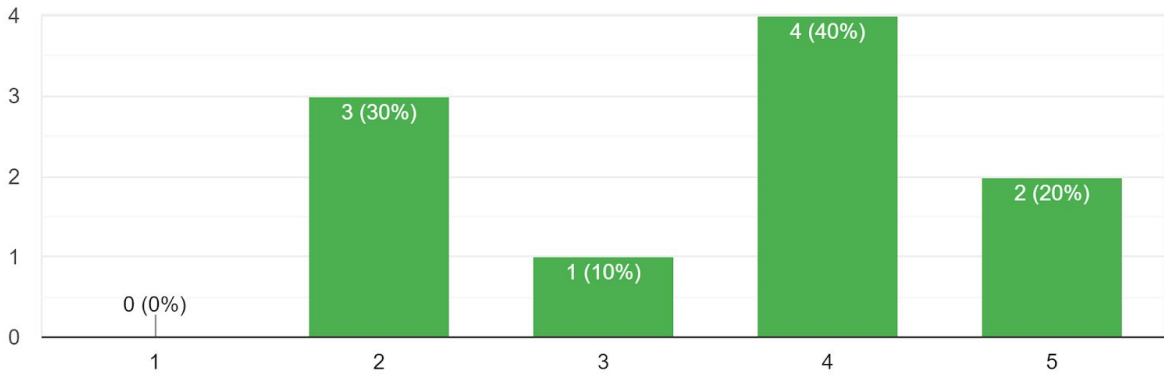
10 responses



Results

For you, how difficult is it to make regular progress on goals you have set for yourself?

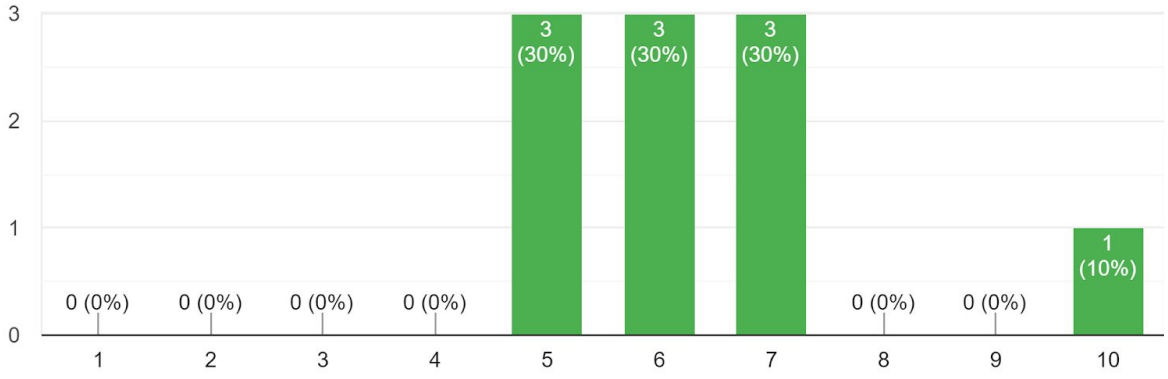
10 responses



The scale is: 1- “It is not at all difficult.” to 5- “It is very difficult.”

How much did you enjoy using the Goal Garden app? Focus on how enjoyable the experience was for you.

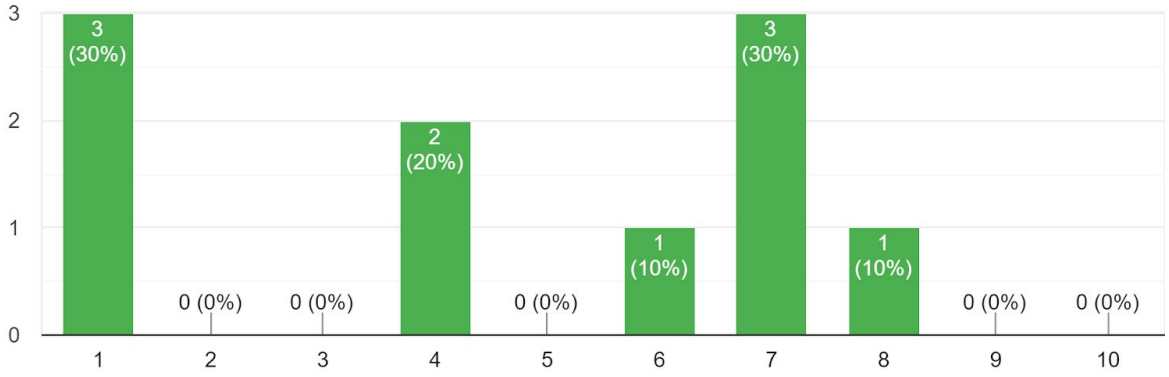
10 responses



The scale is: 1- “It was an extremely unpleasant experience.” to 10- “It was an extremely enjoyable experience.”

What was the highest level of frustration you felt while using the app?

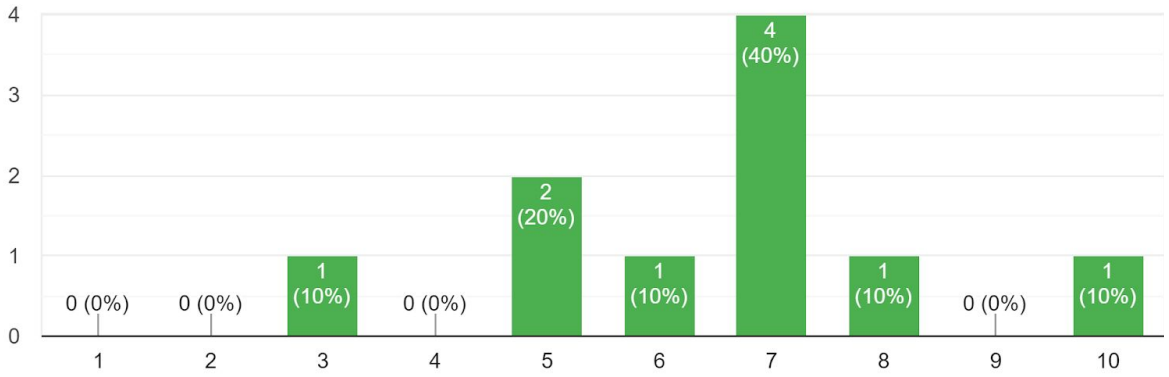
10 responses



The scale is: 1- “I did not feel any frustration at all while using the app.” to 10- “I felt extremely frustrated.”

How helpful do you think this app would be in helping you maintain your goals?

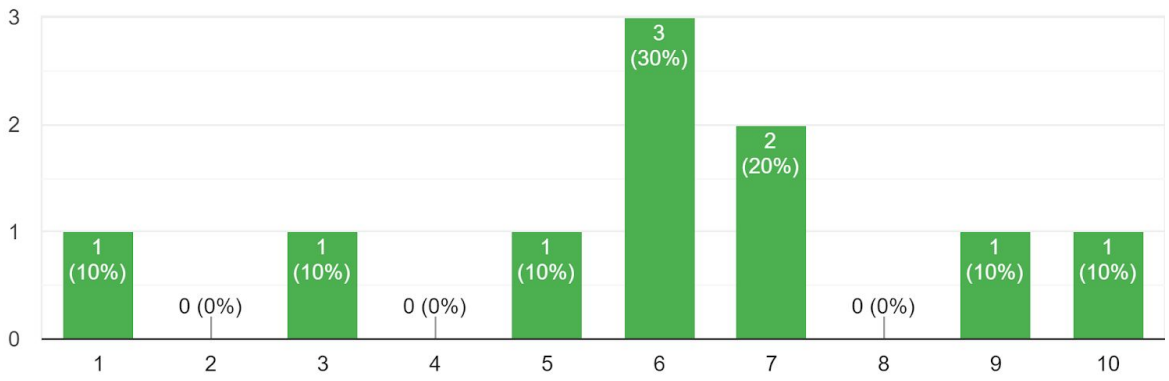
10 responses



The scale is: 1- “It would not be helpful at all.” to 10- “It would be extremely helpful.”

What is the likelihood of you using this app if it was freely available to you?

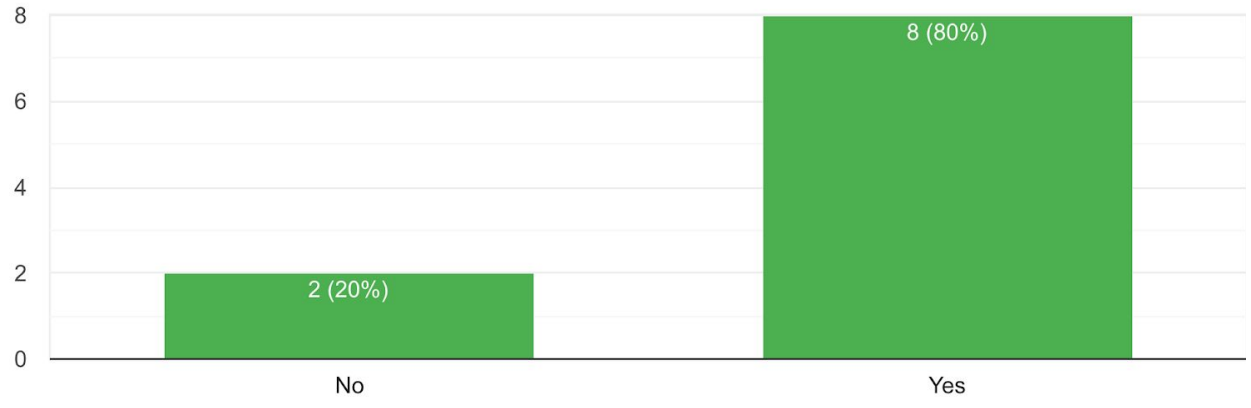
10 responses



The scale is: 1- “I would definitely not use this app.” to 10- “I would definitely use this app.”

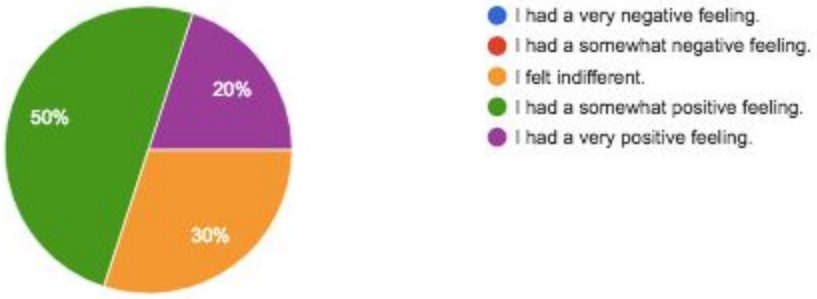
Would you recommend this app to a friend? Write yes or no as a response.

10 responses



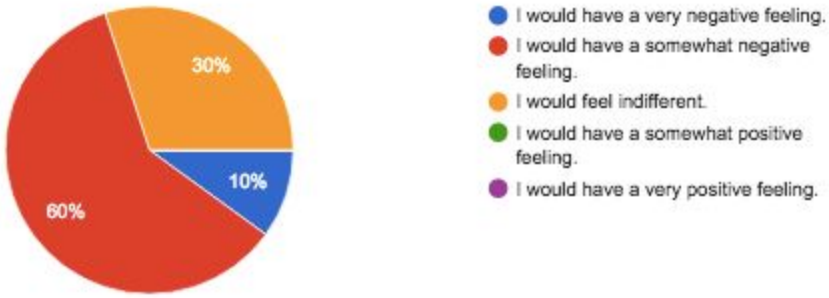
Think about when you stated that you made progress on a particular goal, and the plant grew. What kind of feeling did you have when you saw the plant grow?

10 responses



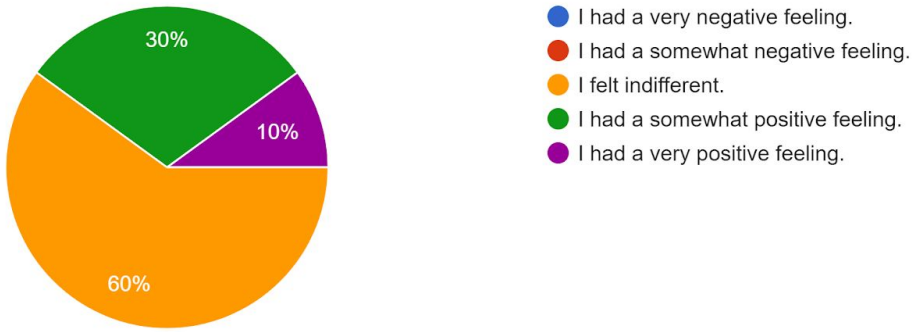
Recall that if you did not make progress on your goals, the plant associated with that goal would wither and become unhealthy. How would you feel if a plant started to wither because you did not make progress on a goal?

10 responses



Recall the "Goal Garden", the collection of flowering plants that represented completed goals. How did you feel whe...leted goals and the flowering plants?

10 responses



What did you enjoy about using this app? Please explain.

10 responses

I liked the concept of the app
Good idea for goals
It kept me motivated on the goals that I set for myself
The plants were pretty.
It was easy to understand.
it had a good concept
It was very user friendly and positive
the plant growing
Cool idea
I liked the plants growing when i hit yes

What did you not enjoy about this app. Please explain.

10 responses

A little confusing to know what to do once the goal was created
Slightly confusing to use
The layout and design
I want to plant my plants in the ground.
There was nothing I did not enjoy.
the layout was a little confusing
Could have better graphics
confusing menu
I dont think it would help me much
I think it would be cool to have a better "garden"

Discussion

After completing our evaluations and interviews, we were able to draw conclusions from all of our data. For the most part, it seemed like users enjoyed our idea and thought there was a positive feeling associated with the plant growing. They also claimed to have a negative feeling when the plant did not grow when they selected that they did not make progress on their goal. Some users claim that the application was easy and clear to navigate. However, a few mentioned the opposite. The users that complained commented that the application was confusing to use. We could change this simply by making our menu options more clear. For example, instead of calling the home screen the “Garden” screen, we would call it the “home screen”. In general, this was users’ biggest complaint. We can also let the user know their new goal has been saved and direct them to a new screen. Other complaints included that they do not think the app would be beneficial. However, this is true with any application and only 1/10 of our survey takers mentioned this. In total, this is not a major concern for us. Our main concern is making sure the user has an enjoyable experience. To ensure this happens we need to take the concerns and fix our problem of having a slightly confusing menu at the bottom. All other aspects of our application seem to be successful through our evaluations and surveys.

When asked how difficult they find it to make progress on their goals, the average answer was 3.5. This means that the average user finds it moderately difficult to maintain progress on their goals. This means that there is a market for an application that does what Goal Garden does. All of the users found the application to be neutrally enjoyable or enjoyable. This could be improved by having our graphics improved in our final design. Most of the users thought that the app would be helpful in maintaining their goals, and they would recommend the app to a friend. Most users also felt appropriate emotions when the plants grew or did not grow, depending on whether they made progress on a goal. However, the users felt largely indifferent when looking at their completed goals. This may be because they were not goals that they themselves actually completed. We may need to do longer-scaled tests, such that a user can actually form a goal and make progress on that goal within the app. A test like this would help us understand if our design helps the users make emotional connections to their plants as they make a progress on their goals.

Appendix

Google Survey
https://docs.google.com/forms/d/e/1FAIpQLSdlHgtEmxReWYURF8xYgSm4LxlWLrHnE0z7gDh165QuvhVHvw/viewform?usp=sf_link

Script
https://docs.google.com/document/d/14AJGtiaFKeEV9zFPiFPHVmn2PqSrakY1Cp8ZY6uNT4k/edit?usp=sharing

Prototype
https://drive.google.com/file/d/1YECTWYV8PsJAyb9i8OMEeIuLhIvhDnCU/view

GitHub
https://github.com/DawgBots/goal_garden