

# Usability Testing Guide

## Objective

Below, we have created a detailed guide to test Bridget and her compatibility with our intended users. This will be a formative usability test to evaluate our current Bridget prototype's efficacy and ability to provide an intuitive experience for our target demographic. We hope to find areas in which we can improve our design and our users' experiences.

We will be testing the visual and voice interface with adults age 65 and over.

## Study Logistics

For this study, one participant will be engaged at a time. Each study session will be broken into two portions. In the first half, we will test Bridget's visual user interface. After those tasks have been completed, there will be a post-test debrief where we will ask various questions to gauge the user's experience. Once this post-test is complete, the voice interface will be tested in a similar fashion. Moderators will then ask the participants scripted questions, as well as any questions the moderators may have based on the participant's actions during the test.

## Materials

- Bridget Prototype
- User Interface Prototype via Adobe XD (displayed on Bridget Prototype's screen)
- Screen Recorder
- Video Camera
- Microphone for "Wizard of Oz" moderator, attached to a speaker system
- Voice Interface Diagram/Guide for "Wizard of Oz" moderator
- Barrier between the "Wizard of Oz" moderator and the participant
- Separate computer/laptop for taking notes
- Action/Mistakes/Difficulties Checklist
- Moderator's General Guide
- Test plan
- Furnished Testing Space
- Snacks
- Water bottles

## Participants

For the most accurate results, we plan to find 5 or more participants that match the demographics of our intended primary users. Below are our requirements that will determine a potential participant's eligibility:

1. Over 65 years of age
2. Lives independently or with other persons 65+
3. Some experience using screen devices (phone, tablet, computer, etc.)
4. Willing and able to participate in a 1.5 hour long study

These criteria are important because they match the characteristics of our intended primary users. We believe our users will have some (possibly limited) experience with screen devices, but we do not expect them to be experts.

It may be difficult to find users that are willing to come to a research facility to conduct this study. Our user group might not have as much experience being research participants as average college students, so this might affect the data we collect.

## Researchers

Three moderators will conduct the usability testing. These are the specific roles:

1. Guide Moderator: This is the moderator that interacts the most with the participant. They will introduce the study, administer the tasks, and ask all questions. They will do the majority of the talking.
2. Note-Taking Moderator: This moderator will use a spreadsheet to keep track of errors, questions and actions the user takes when completing each task. They will also take notes and help the moderator with follow-up questions by noting actions the participant took that the moderators might want to clarify or further understand. This is to ensure that we get the most amount of information as possible while we are with the participant.
3. “Wizard of Oz” Moderator: This moderator will be in a separate room and will not interact with the participant. When testing Bridget’s voice user interface, they will speak into a microphone to respond to participant commands using the voice command diagram. This moderator can also provide technical assistance if needed.

## Environment

Bridget is designed to exist within the primary user’s home, most likely in common spaces like their kitchen or living room. Because we will be testing the voice interface through our “Wizard of Oz” moderator, we will need a more controlled testing environment. Though it will not be the user’s actual home, the testing environment will be set up to simulate a living room with comfortable seating, lamps, plants, pictures/artwork, books, and snacks to help the participants feel at ease. In terms of our testing environment, we will prioritize our participants’ comfort to avoid the negative effects of physical discomfort and to best simulate the comfort they experience in their homes.

# Study Method

This is a general outline of the study. Durations are a rough estimate and can vary greatly from participant to participant. For the more detailed guide, please see the discussion guide section below.

### Introduction (10 minutes)

To make the participants more comfortable, the moderators will take some time to introduce themselves and participants will be introduced to Bridget. Moderators will then explain the purpose and general overview of the study. Snacks and beverages will be provided. See discussion guide for details.

### Demographic Questionnaire (5 minutes)

Before the testing begins, participants will be asked to fill out a questionnaire that will help us better understand their demographics and experiences. They will use an online questionnaire program (such as Qualtrics) to fill this out and submit it. We hope the participant will feel more comfortable giving honest information than they would if the moderator were to ask these questions. We also expect participants to take this questionnaire at a slower pace, so we have allotted 10 minutes but it could be completed in a shorter amount of time.

### Simulated Use Assessment - Graphical User Interface (15 minutes)

After participants are introduced to Bridget, the moderator will ask them to perform a series of tasks using the physical prototype and its graphical user interface. The tasks will be given one at a time, and once one task is completed they will be asked to complete the next task. Participants will be asked to think aloud and talk through their actions.

### Post-Test Interview - Graphical User Interface (10 minutes):

The moderator will ask the participants a series of closed and open-ended questions. The moderator will be able to ask follow-up questions based on their responses and interactions the moderator noticed during testing.

### Simulated Use Assessment - Voice User Interface (15 minutes):

After participants are introduced to Bridget, the moderator will ask them to perform a series of tasks in which they are only able to use voice commands. A hidden “Wizard of Oz” moderator will use the Voice Interface Diagram to respond to the participant’s commands. They will speak these responses into a microphone connected to the Bridget prototype’s speakers for the participant to hear. The tasks will be given one at a time, and once one task is completed they will be asked to complete the next task. Participants will be asked to think aloud and talk through their actions.

### Post-Test Interview - Voice User Interface (10 minutes):

The moderator will ask the participants a series of closed and open-ended questions. The moderator will be able to ask follow-up questions based on their responses and interactions the moderator noticed during testing.

### Post-Test Interview - Overall Impressions (15 minutes):

After asking more specific questions regarding Bridget's voice user interface, the participants will be asked a series of closed and open ended questions regarding their overall experience with Bridget. Moderators will be able to ask follow-up questions and any other questions they have from the user testing.

### Conclusion (5 minutes):

Participants will be compensated and thanked for their participation in the study.

## Data Collection and Analysis

These usability tests will provide an extensive amount of qualitative and quantitative data that we will be able to use to better understand and improve Bridget.

### Tools and Specific Data Collected

We will be using several different tools to collect data. For our analysis, we will be focusing on the qualitative data we are collecting from these interviews, but we will also be collecting quantitative data. Below is a list of the different tools we will use and the specific data that each tool will collect. There will be some overlap in the data that different sources collect.

- Pre-Test Computer Administered Questionnaire
  - Demographic Information
  - User experiences with similar products
- Screen Recorder
  - Reaction Times (how long it takes to complete each graphical user interface task)
  - Amount of "clicks" per task
  -
- Spreadsheet (used by Note-Taking Moderator)
  - Number of steps the user takes to complete each task
  - Number of voice command attempts to complete each task
  - Number of use errors per task
  - Observations of interactions with prototype
  - Responses to interview questions
  - Participant Suggestions, comments, and preferences
  - Root causes of use errors
- Video Camera

- Responses to interview questions
  - Participant suggestions and comments
- Microphone
  - Commands and responses from Voice User Interface tasks
  - Amount of time it takes for a user to give a voice command after hearing the task

## Methods for Analyzing Data

For this usability test, we will be focusing on the qualitative data collected. As soon as the participant has left, all three moderators and any observers will review the data they have collected. Moderators will collectively go over notes and add details while the study session is still fresh in their minds. They will also have the recording of the study session for future reference, if needed. If there were any difficulties caused by wording or study design flaws during the session, the researchers will consider refining the tasks and wording for the next participant.

Once all participant data is collected, the researchers will comb through the data and create a coding scheme based on common findings to organize the data into relevant categories and concepts. This data will then be reviewed by the research team, who will use this information to reiterate and refine the Bridget prototype.

# Discussion Guide

## Introduction

Moderator: Hello, thank you for joining us. Today, we will be testing out a home voice assistant (named Bridget) designed to help people 65+ keep track of their health. For this test, we will ask you to complete a series of tasks. These tasks will involve either voice commands or interaction with a screen. This test is designed to help us evaluate the home voice assistant and not you as a participant, so we appreciate your honest feedback. We also ask that you “think out loud” and guide us through your thought process, if possible. This test should take about 90 minutes. Everything here is voluntary, so if any question or action makes you uncomfortable, you are allowed to take a break or walk out at any time.

We will first begin with a computer questionnaire that asks a few questions regarding your demographics and your previous experience with similar devices.

## Demographics Questionnaire

1. How old are you?
  - a. 65-75
  - b. 76-86
  - c. 87-97
  - d. 98+
2. How many people live in your home? (Including yourself)
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
  - f. 6 or more
3. [IF #2 NOT ANSWER A]
  - a. ...
4. What is your current employment status?
  - a. Employed Full-Time
  - b. Employed Part-Time (<40 hours a week)
  - c. Unemployed...
  - d. Retired
5. What is the highest level of education you have completed?
  - a. Some High School
  - b. High School
  - c. Bachelor's Degree
  - d. Master's Degree
  - e. PhD or higher
  - f. Trade School
  - g. Prefer not to say
6. What electronic devices do you have in your home? Mark all that apply.
  - a. Mobile Phone
  - b. iPad or Tablet
  - c. Laptop
  - d. Desktop Computer
  - e. Television
  - f. Radio
  - g. Home Assistant (Alexa, Google Home, etc)
  - h. Gaming Console (Playstation, Xbox, Switch, etc.)
  - i. Smartwatch

- j. Fitbit
  - k. "Ring" Doorbell Camera
  - l. None of the above
7. On average, how often do you use electronic devices (such as mobile phones, tablets, televisions, radios, etc.)
- a. Multiple times a day
  - b. Once a day
  - c. More than once a week
  - d. About once a week
  - e. Less than once a week
8. On a scale of 1 to 5, how comfortable do you feel using electronic devices?
- a. 1 = Extremely Uncomfortable
  - b. 2 = Somewhat Uncomfortable
  - c. 3 = Neither Comfortable nor Uncomfortable
  - d. 4 = Somewhat Comfortable
  - e. 5 = Extremely Comfortable

Moderator: Thank you for completing the questionnaire. We will now ask you to complete a series of tasks on Bridget's screen. Try to think out loud as you complete each task.

### Graphical User Interface Tasks

1. Enter your mood for today.
2. Locate your medication schedule for today.
3. Open your notebook and write a note.
4. View pictures that are saved on the device.
5. Add your blood pressure for today to your blood pressure log.
  - a. Use this blood pressure: 110/70
6. Check your schedule for April 25th.
7. Add a doctor's appointment to your schedule for April 25th at 2pm.
8. Check your mood statistics.
9. Locate your health statistics.
10. Let the device know that there is an emergency.

Moderator: Now that you have completed the tasks for the first portion of the test, we will ask you some questions about your experience.

### Post-Test Interview - Graphical User Interface Tasks

1. What are your overall impressions of Bridget's visual design?
2. What do you think could be improved?
3. What do you like about the user interface?
4. Which task did you find the most challenging? Why?
5. Which task did you find the easiest? Why?
6. On a scale of 1 to 5, how would you rate your experience with Bridget so far? Why?
  - a. 1 is terrible, 5 is amazing.
7. Do you have any other comments or suggestions to add?

Moderator: We will now move on to tasks that test our voice command system. For this test, you can only complete the tasks using voice commands. Bridget will respond. If she does not respond correctly, try another voice command to complete the task.

### Voice Command Tasks:

1. Check your schedule for today.
2. Add a doctor's appointment to your calendar for April 25th at 3pm.
3. Let's say you cannot find your phone. Use Bridget to help you find your phone.
4. Check the weather for today.
5. Check your last blood pressure reading.
6. Report an emergency.

### Post-Test Interview - Voice User Interface

Moderator: Now that you've interacted with Bridget, we will ask you a few questions about your experience. We might also ask you follow-up or clarification questions.

1. What are your overall impressions of Bridget's voice interactions?
2. What do you think could be improved?
3. What do you like about the voice interactions?
4. Which task did you find the most challenging? Why?
5. Which task did you find the easiest? Why?
6. On a scale of 1 to 5, how would you rate your experience with Bridget voice interface? Why?
  - a. 1 is terrible, 5 is amazing.
7. Do you have any other comments or suggestions to add?

### Post-Test Interview - Overall Impressions



Moderator: We will now ask questions about your overall experience with Bridget today.

1. What are your overall impressions of this product?
2. What do you like about this product?
3. What do you think can be improved?
4. Would you use a product like this in your home? Why or why not?
5. Would you recommend this product to your friends? Why or why not?
6. Do you have any other comments or suggestions?

## Conclusion

Thank you for taking the time to participate in our study today. We greatly appreciate your feedback. Do you have any questions for us? (Answer questions and give compensation)