

# 11 INTRODUCTION TO USABILITY AND USABILITY TESTING

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This chapter describes usability and usability testing.<sup>1</sup> Before we jump into the steps involved in such testing, let's take a look at what we mean by these terms. **Usability** refers to “the quality of a user's experience when interacting with products or systems, including websites, software, devices, or applications. Usability is about effectiveness, efficiency and the overall satisfaction of the user” (“Usability Evaluation Basics”). So, a person's ability to quickly and easily use a texting app to send a text message is a matter of usability—the more easily and quickly they can perform the task, the more usable the app is. For instance, a large, visible button that indicates “Reply,” is quicker and easier for someone to use than a menu of options.

**Usability testing** refers to the task of observing users who are performing planned, purposeful tasks with a product for the purpose of collecting data about how the user interacts with and responds to the product. So, asking a person to use a new app to send a text and then observing how easily and effectively they can perform that task is usability testing. For example, if there is no “Reply” button on the screen, and the user has to scroll through a menu of options to reply, your observing that scrolling behavior (and the possible ensuing frustration) is an example of usability testing.

In usability and usability testing, the term “**users**” refers to individuals who will be interacting with (or *using*) the products (e.g., instructions, websites, mobile apps) we design and develop. Think of usability and usability testing as a research method for gathering information from and about users. The goal is to focus, or center, the design of a product around the individuals who will use it to meet their expectations and needs. A user-centered approach is important in product design and

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development because without it, we are only guessing what will work best for the user. And quite often, these guesses are simply incorrect. The solution is to study the users for whom we are designing products so that our products will meet their needs and expectations. When we design products (whether they be doors, or documents, or mobile applications), it is our responsibility to make sure those products do not unnecessarily complicate the user's life.

To make a product user-centered, you should consider different dimensions (factors) or metrics for measuring usability. Usability expert, Whitney Quesenbery, has identified five dimensions you can use to evaluate the usability of an item:

- Effective
- Efficient
- Engaging
- Error Tolerant
- Easy to learn

To test for usability, you need to answer more specific questions such as those raised by Quesenbery:

- How completely and accurately is the work or experience completed or goals reached?
- How quickly can this work be completed?
- How well does the interface draw the user into the interaction, and how pleasant and satisfying it is to use?
- How well does the product prevent errors and help the user recover from mistakes that do occur?
- How well does the product support both the initial orientation and continued learning throughout the complete lifetime of use?

Thinking about the ways you will measure usability and the types of questions you want to answer will help you more effectively and systematically gather data from representative users.

It is important for technical communicators to understand usability and usability testing. Researchers (Kastman Breuch et al.) have explained that while usability studies and technical communication may use different terminology, the two fields clearly have overlapping emphases, and practitioners in both areas quite often share similar skill sets. Although not all technical communicators will be tasked with conducting usability testing, the principles that this testing employ will help you make decisions that allow you to create positive experiences for the people for whom

you create online help, documents, web pages, and other products (your *users*). Also, any document you write for an audience becomes an item that others will use to perform a particular activity or achieve a given objective. For this reason, an understanding of usability and usability testing can help you think about who the readers of your work might be and how you might review and revise your work to meet the needs and expectations of those readers.

This chapter provides you with an introduction to core concepts, tools, and processes associated with usability and usability testing. The objective of the chapter is to help familiarize you with such factors so you can better understand what is involved in these activities. You can then better engage in conversations around these topics and learn more about these processes as you collaborate with others during product development and design activities.

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## UNDERSTANDING USERS

### DEFINITION OF USER

**A**s we mentioned, users are people who will be interacting with the products you design. Developing an accurate sense of the user is impossible without doing some research. Without this research, you will not have a clear idea of the user's potential inclinations, tendencies, and reactions. Only after you understand your potential users will you have the information necessary to comprehend and respond to questions such as: What confuses them? What frustrates them? What brings them joy? The answers to such questions are key because they allow you to redesign your product accordingly.

### LEARNING ABOUT THE USER

It is not uncommon for us to assume that our users (and perhaps the entire world!) are exactly like us. Manifestly, we know that this is not true, but our instinct is to communicate and design in a way that makes sense to ourselves. However, this egocentric way of communicating and designing sometimes renders products that are confusing or make life more difficult for our intended users. There are several methods by which we can learn about our potential users. Some methods involve working with data about representative users. Other methods require interacting with actual or representative users.

## INITIAL METHODS FOR UNDERSTANDING USERS

Initial methods do not necessarily involve interacting with users; rather, they focus on researching the potential types of users of your product. They are generally used early in the product design process.

**User data** is gathered to describe the relevant quantitative characteristics (demographic information such as age, gender, location, income, family size) of the type of users you want to target (the individuals for whom you will design something). This data is based on known facts and data about actual users. For example, web analytics (i.e., the collection, reporting, and analysis of website data) may show the main type of user that frequents a website: their age, gender, and location. Alternatively, you might have data about typical users of competitor products.

User data is important because it allows you to identify probable needs and skill levels of particular group your product or document is targeting. When developing products, this data is used at the beginning of the product design process to assist us in creating personas and journey maps, which are covered later. As a result, you can create more usable products because you are not relying solely on your own preferences and desires. Focusing on user data at this beginning stage helps ensure that you are creating a usable product for its intended audience.

**Personas** are fictional characters based on the real user data that you have collected. They represent a “typical” member of a particular group (e.g., the typical college student from Michigan) and are used to understand how such users would perform an activity or use a product. They answer questions about user motivations, habits, and probable preferences for interacting with the product.

Personas help product developers consider questions such as “What would users from this group do?” when creating products for the members of that group. For example, if you are testing a mobile app to order from a food delivery service, your personas might include a busy stay-at-home mother, a college student living in their dorm, or a wheelchair-bound person who is incapable of driving. You may have questions such as, “What would the typical college student from Michigan do when using an app to order a food delivery to their dorm?”

Creating personas is important because they keep your decisions focused on the intended users of your product or document. Personas give a face to your actual users’ potential motivations, fears, concerns, and goals as they relate to the product you are testing. Personas allow you to move past your own assumptions and create products that meet the actual needs and preferences of your user. When developing products, personas are used

starting at the beginning of the product design process. Using personas continues to ensure the usability of the product.

**Journey maps** are graphical representations or visualizations of the process the user follows to accomplish their goals. Essentially, you are charting the path, or sequence of actions, users take as they move through a location in physical space or a series of online screens to perform an activity. For example, a person who is using a mobile app to order from a food delivery service might first select the restaurant from which they want to order food, then select from a menu, and finally complete the transaction with a payment. The journey map for this process would not only establish a timeline of events, but it would also include the potential thoughts and emotions experienced by the user as they go through this process. For instance, this particular user might be excited by the restaurant selection step, overwhelmed by the menu options, and confused by the payment options.

Journey maps are important because they ensure that you will consider and design for the complete range of steps that individuals take while using your product. They also allow you to identify potential pain points (e.g., areas that are difficult to navigate or confusing) for individuals. When developing products, these maps are used throughout the design process. As a result, you can create a more seamless experience for your users.

## ADVANCED METHODS FOR UNDERSTANDING USERS

If we fail to consult or involve representatives of actual users in our product or document design, the decisions we make regarding our design will at best be based on our assumptions of how these users will behave. At worst, our decisions will not even consider the user. Take the classic example (discussed by Norman) of the door that opens by being *pushed*, but has a handle, signifying (erroneously) that it needs to be *pulled*. This example shows how poor design may not only confuse the user but might also make the product appear inoperable.

User data, personas, and journey maps are three tools you can use early in the design process of your product or document. These tools encourage you to keep your users front of mind from the start of your project. They assure that you do not simply project your own needs and desires into the design of your product or document. These tools can also be useful when describing your process to others on the development or management team. Additionally, user data, personas, and journey maps can inform how you select your participants and design your later usability tests. In the following sections, we provide examples of how each of these tools can be implemented and set you up for success on the next steps for designing and conducting a usability test.

## EXAMPLE: FASTER FOOD MOBILE USER PROFILE AND PERSONAS

Let's say you want to discover how a typical user might interact with the new food delivery application, "Faster Food" that you have developed (see Figure 11.1).

The first task you perform is to create a user profile. For the "Faster Food" app, you develop a user profile that states our users will fit the following criteria:

- Eat fast food
- Have experience using a mobile app
- Be an adult age 18 or over

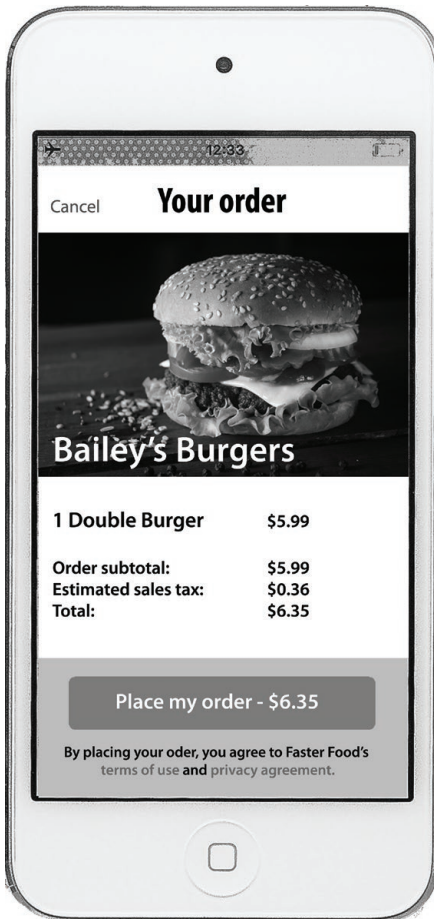


Figure 11.1: Example of Mobile App

In your user profile, you also identify two categories of users:

1. **Novice users:** Teenagers and adults who are familiar with fast food menus but may not have experience ordering from these restaurants online.
2. **Advanced users:** Teenagers and adults who are both familiar with the fast food restaurants in their area and are experienced using mobile apps to order from such places.

Using this profile and the user categories, you next create two personas, Sean and Roxanne, which you can see in Figure 11.2.

Sean and Roxanne are composites that you created based on data from web analytics that identified demographic information of your average users. Sean and Roxanne’s fictional identities include information such as their photos, occupations, yearly income, experience level, and buying habits.

The personas of Sean and Roxanne are important throughout the design and development of your “Faster Food” App to create reliable and realistic representations of your users as you decide what will meet their needs and expectations. For example, in the “Faster Food” app, you might decide to highlight inexpensive restaurants that might be popular with Sean, who has a limited income and lives in the dorms. Alternatively, you might choose to highlight nearby restaurants for Roxanne, who prefers to have her lunch delivered quickly from a restaurant that is near her workplace.

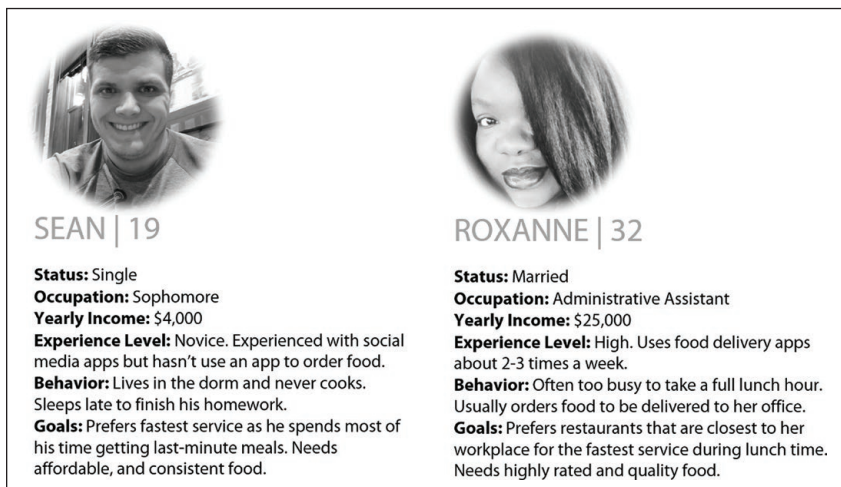


Figure 11.2: Example of Personas

## UNDERSTANDING TESTING AND TEST PLANS

### ITERATIVE PROCESS OF TESTING

Ideally, you should start usability testing at the developmental stages of the production process (formative testing), where user feedback is repeatedly gathered and implemented. In other words, the usability testing process should be iterative, where you conduct small studies to learn about user experience, make changes based on what you learned, and then test again. Summative testing is usually conducted later in the product development cycle, when the product is fully developed, to determine whether it meets user requirements. During each stage of usability testing, you want to focus on the user's experience with your product. You want to discover how they initially interact with and react to the product. This will allow you to discern potential questions and pain points for the users. To prepare for each test, you need to develop a test plan.

### PURPOSE OF TEST PLAN

The test plan is a tool that will help you discover how your typical users might interact with your product. A test plan documents your plans for the test, including what you will be testing, who you will be testing, and the tasks you will undertake during the testing.

The purpose for documenting this information is to provide a single source of information that all stakeholders can reference before, during, and after the usability test. Stakeholders are the people who have something invested in the test. This typically includes people designing the test, those administering the test, the project manager, and those financing the test. The final test may deviate from the initial plan, but the changes should also be documented so that the test plan remains up-to-date. As Barnum notes, "you should think of the test plan as a living document that evolves as the materials get fleshed out" (142).

### THINK-ALLOUD PROTOCOL

There are many types of usability testing methods depending on the stage of the testing you are in as well as the specific types of data (e.g., qualitative or quantitative) that you are collecting. In this chapter, we introduce a very basic usability test that can be easily performed, the think-aloud protocol, where the participants verbalize their thoughts while they are attempting to use a prototype (a product model that may not include full functionality). This "thinking out loud" allows the tester (the person conducting the



test) to understand what the participants are thinking as they engage with the product. It not only allows the tester to identify potential areas of confusion or frustration the participants may be experiencing, but also aspects of the product that are especially pleasing or useful to the participants.

## SECTIONS OF A SIMPLE TEST PLAN

Although every test plan is unique, there are several sections that most test plans involve. These include the following:

- Product goal
- Test objectives
- User profile
- Methodology
- List of tasks

### PRODUCT GOAL

The **product goal** identifies the purpose of your product or document. It is the purpose for which the users intend to use your product or document.

### TEST OBJECTIVES

**Test objectives** articulate the purpose for your test. They answer the question: What do I want to discover from this test? Test objectives might include: How easy/difficult is it for the user to navigate this web page? What are the specific pain points (areas of difficulty) for the user? The test objectives will drive the content and organization of your test.

### USER PROFILE

A **user profile** is included in the test plan to effectively articulate who it is that you are looking to test. For instance, this might include demographic information (such as age and gender), job title, level of technical expertise (novice, skilled, or expert), needs and expectations, and steps that are taken to complete a specific task. The earlier work you did analyzing user data and creating personas will be helpful in deciding the types of users that would be appropriate participants in your test. *See the previous Understanding Users section for more details.*

When you do a usability test of a product, you want to select participants (the individuals who will test, or try to use, the product) who

match this profile: individuals who meet these criteria and are therefore representative of these users. Only individuals who meet these criteria qualify for—or can participate in—this study; those who do not meet these criteria cannot. An example of a user profile might be, “Adults, 18 and over, who use social media and are concerned with privacy.” Individuals would then need to meet these criteria to be included in the related study.

## METHODOLOGY

Your test **methodology** describes how you will gather data, more specifically, the number of participants that you need, length of the test, and test procedure. To ensure that you gather the type of data that will be most useful to you, it is important that you provide your participants with specific tasks to perform.

## LIST OF TASKS

These **tasks** are often embedded within scenarios that provide the context for the user’s goals. For instance, if you are interested in how a user might interact with your e-commerce site, you could develop a scenario in which the participant has to find and place orders in an online shopping cart. One specific task involved in this scenario might be to find a particular item, say, a blanket. As Barnum notes, “without a common set of scenarios, users will go their own way in an interface, which makes it difficult to see patterns of usage and recurrence of problems among and between users” (19).

## EXAMPLE: FASTER FOOD USABILITY TEST PLAN (SIMPLE)

The first part of the test plan (Figure 11.3) is to articulate the product goal and test objectives. As you can see, your objectives are to verify the navigation within the app is clear and to determine how enjoyable the app is to use. Next, you will create a user profile based on the data that you have previously obtained about actual users. Your methodology is a simple, think-aloud protocol. Next, you will document the list of tasks the participants will complete, which includes:

1. Navigate from the homepage to the restaurant selection page.
2. Return to the home screen from a restaurant page.
3. Navigate to the pay screen.
4. Navigate to the home address screen.

### Faster Food Mobile App Test Plan (Simple Version)

**Product Goal**  
Help users order food from local fast food restaurants

**Test Objectives**

- Verify the navigation within the app is clear.
- Determine how enjoyable the app is to use.

**User Profile**

- Eat fast food
- Have experience using a mobile app
- Be an adult age 18 or over

**Methodology**  
Using the think-aloud protocol, we plan to test a total of five participants (two novice and three advanced), who will verbally describe their experience interacting with the Faster Food app. Their descriptions will be recorded by a note-taker. Each test will be 15 minutes.

**List of Tasks**

1. Navigate from the homepage to the restaurant selection page.
2. Return to the home screen from a restaurant page.
3. Navigate to the pay screen.
4. Navigate to the home address screen.

Figure 11.3: Example of Simple Usability Test Plan

## ADDITIONAL SECTIONS INCLUDED IN AN ADVANCED TEST PLAN

An advanced test plan would contain more comprehensive tasks and test details, including different types of qualitative and quantitative data (**evaluation method**) you are seeking and specifics about the testing environment (**description of testing environment**), as described later in this chapter.

## EVALUATION METHOD

There are multiple ways to collect both quantitative and qualitative data, depending on whether you are conducting formative or summative testing. There are two types of quantitative data: **Performance data** is based on measurements of users' actions, whereas **preference data** is based on user's responses to questions on questionnaires. Qualitative data includes observations of user actions and user comments (during the test or on questionnaires). You can collect either type of data using the following methods.

**Audio and/or video recording.** For example, if you are testing a website, you can use a screen-recording program to record the user's on-screen activities (e.g., where they click or how long it takes them to navigate).

**Verbal feedback protocol.** There are various ways to solicit qualitative feedback from your users using the think-aloud protocol (e.g., concurrent think aloud, retrospective think aloud, concurrent probing, or retrospective probing, as described in “Running a Usability Test”). You can also use product reaction cards, which were developed by Microsoft (Benedek and Miner) to provide a rich understanding of user experience.

**Questionnaires.** The three common types of questionnaires include pre-test (e.g., on user preferences), post-task (e.g., on issues such as ease or difficulty, after each task), and post-test (e.g., on the overall experience at the end of the test).

Barnum recommends combining “metrics with your observations, comments, from participants, and their responses to open-ended questions” (137) to create a highly effective test.

## DESCRIPTION OF TESTING ENVIRONMENT

The description of your testing environment details the physical conditions under which the testing will occur. For instance, you might be observing an individual using a new point of sale (POS) app in a fast-food restaurant. Alternatively, you might be observing an individual using the same app in a testing lab. Each of these environments is going to be different. The noise level, lighting, level of activity, and other considerations might have an impact on your test.

## EXAMPLE: FASTER FOOD USABILITY TEST PLAN (ADVANCED)

In an advanced test plan of the Faster Food app, you will include the additional sections such as evaluation method and description of testing environment. See Figure 11.4 and Figure 11.5 for an example of an advanced test plan.

## PILOT TEST

A pilot test is a small preliminary study used to test a proposed research study before conducting a full-scale study. This preliminary study typically follows the same procedures as its full-scale counterpart. The primary purpose of a pilot study is to evaluate the feasibility of the proposed study. A pilot test is sometimes called a field test or a feasibility study.

A pilot test will allow you to see if you are testing for the correct questions. Pilot tests also allow you to be sure you have considered logistical implications and established best practices for the full-scale usability test. For example, researchers (Zimmerman et al.) who were investigating

rural health and safety issues planned a pilot in which they tested pesticide warning labels at a university's horticultural research farm. Although they believed they had sufficiently prepared for the usability tests, the researchers encountered a few logistical problems including a thunderstorm. They then knew they had to revise their full-scale study and equip the testing team with adequate clothing to include a better hat and protective boots.

## RECRUITING PARTICIPANTS

Often, students wonder how many participants they need for a usability study. Nielsen makes a sound argument for aiming for three to five users (Nielsen). They explain that you will learn the most from the first user. The second and third user will do many of the same things that you already observed with the first user. The third user will generate a small amount of new data, but not as much as the first and second user. As you add users, you will continue to observe the same behaviors and will learn less with each additional user. As Nielsen explains, "After the fifth user, you are wasting your time by observing the same findings repeatedly but not learning much new."

**Faster Food Mobile App Test Plan (Advanced Version)**

**Product Goal**  
Help users order food from local fast food restaurants

**Test Goals**

- Test that the buttons and icons on the app are consistent and intuitively positioned.
- Test that the text is readable and understandable to the users.
- Test that the costs/fees and delivery times are clearly visible to the users.
- Verify the navigation within the app is clear.
- Determine how enjoyable the app is to use.

**User Profile**

- Eat fast food
- Have experience using a mobile app
- Be an adult age 18 or over

**Methodology and List of Tasks**

**Number of participants:**  
We plan to test a total of five participants: two are novice and three are advanced users.

**Length of the test:**  
The total length of each session will be 30 minutes, including:

- Introduction: 5 minutes
- Task scenarios: 20 minutes
- Debriefing: 5 minutes

Figure 11.4: Advanced Test Plan Part 1

**Test procedure:**  
The test will begin with an introduction of the test, followed by scenarios described below, and end with debriefing.

Scenario 1: You want to order a Big Mac value meal from McDonald's, and you want to select a large Diet Coke as your drink. Please show us how you would select the closest McDonald's to you with the highest ratings and place the items in your cart to checkout. Then, edit your cart by changing the Diet Coke to a Sprite. Provide a special delivery instruction to come to the East entrance of the delivery address. Go back to your cart and checkout by entering your address and credit card information.

Scenario 2: You want to order a Greek salad and a large Passion Papaya Green Tea from Panera Bread. Please show us how you would select the closest Panera Bread to you and place the items in your cart to checkout. Then, go to the dessert menu and add a chocolate chip cookie. Checkout by entering the delivery address and your credit card information.

**Testing environment:**  
The test for the Faster Food mobile app will be conducted in a classroom on our campus, using the mobile phone provided by the researcher. Recording of sessions will be done using the webcam on a laptop. The moderator and notetaker will be seated nearby.

**Evaluation Method**

**Qualitative data:**  
Participants will follow the think-aloud protocol, where they verbally describe their experience using the app during the test. Their descriptions will be recorded, and the notetaker will make a note of the comments. After each scenario, users will describe what they enjoyed the most or the least about the app and provide recommendations for improving the app (e.g., on visuals, text, information such as costs and delivery times, and navigation).

**Quantitative data:**  
In addition to the qualitative data, we will also look at the specific number of times certain events occurred, including the following:

- Successful task/scenario completion rate
- Number of critical errors users make that prevent them from finishing their tasks
- Number of non-critical errors users make that affect their efficiency (e.g., using the "back" buttons)
- Amount of time it takes the users to complete the task
- Ease of use and satisfaction of the app on a 5-point Likert Scale

Figure 11.5: Advanced Test Plan Part 2

One of the greatest challenges to conducting a usability test is recruiting participants. Research (Chong, "Implementing Usability Testing") shows that nearly one quarter of students reported that finding users to participate in a usability test was a challenge. To make this process more manageable, it is important that you define specific criteria for potential participants and think broadly about the recruitment process.

## ESTABLISH CRITERIA

Before you start recruiting participants for your usability test, you want to be sure that you have established criteria that potential participants need to meet. You will then use these criteria to screen potential participants. For instance, if you are testing user instructions for a riding lawn mower, you probably want participants who know how to both mow a lawn and

drive some type of vehicle. Selecting a participant who is missing either of these qualifying criteria will not provide you with valid or representative results about how an actual, typical user of your instructions will react. Once you have established criteria that participants need to meet, you are ready to recruit.

## **IDENTIFY SOURCES FOR PARTICIPANTS**

There are several sources from which you can recruit participants for your test. One way is to use your personal and professional networks. As Barnum explains, making requests “through friends, family, business associates, and community connections often leads to qualified applicants for screening” (159). Very often, if a connection you make through one of these channels meets your screening criteria, it is possible they have people within their networks that will also meet your criteria. In this sense, you can often find potential participants via other participants. If you have a limited network, or if you do not have many in your network who will likely meet your criteria, you can research organizations that likely have as members people who fit your desired demographic. For instance, if you are looking for people to test lawn mower instructions, but most people in your network live in apartments and don’t have the need to mow a lawn, you might solicit local homeowners’ associations for names and contact information of potential participants. If you are conducting a usability test for an organization, and they have the budget for external resources, you may decide to hire a market research firm to assist you with your recruitment process. Such firms generally have substantial databases of potential participants who can be organized by particular demographics and can be further interviewed (by the firm) for more specific criteria.

## **SCREEN POTENTIAL PARTICIPANTS**

Just because an individual has met your initial screening criteria, does not mean that person is right for your usability test. Before scheduling someone to participate in your test, you will want to confirm (either by phone or e-mail) that they have, indeed, met your initial criteria. You might also follow-up with additional questions that could disqualify the person. For instance, you probably do not want to select someone who builds lawn mowers—and so would use their own knowledge (instead of your instructions alone)—to evaluate your instructions. You will also want to confirm that your potential participant is available during the time you plan to conduct the usability tests.

## PREPARING TEST MATERIALS AND ENVIRONMENT

Once you have designed and piloted your test, along with recruiting the appropriate number of participants, then you need to prepare test personnel, materials, and the environment for your test. While a simple test using the think-aloud protocol may not have formal roles and responsibilities for the testers, it is still important that you familiarize yourself with the full range of testing roles and tasks.

### ROLES AND RESPONSIBILITIES

If you have a team working on the usability test, there should be at least be two roles:

1. **Moderator/facilitator:** This person will interact the most with the participants by asking unbiased questions and guiding them through the test. For detailed information about the role of the moderator/facilitator, see the *Conducting the Usability Test* section (later in this chapter).
2. **Observer/notetaker:** If your test is not recorded (e.g., audio or visual), you will need a note-taker who will serve as an observer and recorder of the test.

### TEAM CHECKLISTS

Based on the roles that you have assigned for the test, you will need to create checklists that help remind the team members of their responsibilities and ensure that each test session is consistently conducted. For example, the moderator's checklist may include tasks for welcoming the participants, reviewing the consent forms, and providing instructions for the test. The notetaker's checklist may include tasks that need to be completed before, during, and after the test. Loranger provides a nine-step checklist for planning a usability test.

### MODERATOR'S SCRIPT

The goal of having a moderator's script is to ensure that the moderator explains the process in the same or consistent manner to each participant. The script will cover topics such as welcoming the participant, stating the purpose of the study, providing the consent form, explaining the testing process, and describing the think-aloud protocol. It is especially useful to use phrases such as "we are testing the product, not you" before the test to make the participants feel comfortable and less self-conscious about



describing their challenges.

## **OTHER MATERIALS**

Depending on your test plan, you may include other materials such as the following:

- Consent forms that indicate the participant's willingness to participate or be recorded during the test;
- Non-disclosure agreements, if you are testing a product in development;
- Observer/note-taker form on which to record the issues/problems that each participant experiences on each scenario/task;
- Questionnaires to obtain qualitative and quantitative feedback from participants that will enhance your understanding of the user experience;
- 118 product reaction cards created by Microsoft (Benedek and Miner), which include adjectives such as "confusing," "difficult," "engaging," and "entertaining" that the participants select to describe their experience with the product being tested.

## **ENVIRONMENT**

Based on the description of the test environment that you have included in your test plan, you will need to make sure that that space (whether physical or online) is ready for testing. For instance, if the testing will be done in a lab or classroom, you need to be sure the camera is functioning and recording, that there is sufficient seating for participants and observers, and that the noise level is not prohibitive. Similarly, if you are conducting an online test, then you need to be sure that internet connectivity, video cameras, and audio are functioning properly.

## **CONDUCTING THE USABILITY TEST**

The moderator's role is critical in that they will need to conduct the usability test effectively. In our experience, this is the most challenging and critical role because the moderator needs to create a comfortable environment and listen to the participant's feedback carefully (e.g., to ask follow-up questions). While a simple test using the think-aloud protocol may not differentiate between tasks for the moderator and notetaker, it is still important that you familiarize yourself with the full range of these tasks.

## MODERATOR TASKS

Immediately prior to and during the usability test, the moderator has several tasks, which may include the following:

- Meeting, greeting, and briefing the participants.
- Preparing the participants for the feedback method or protocol (e.g., using concurrent think aloud, retrospective think aloud, concurrent probing, or retrospective probing, as described in “Running a Usability Test”).
- Being effective and unbiased by monitoring both your verbal and nonverbal communication and asking “what” or “how” (and not “why”) questions to get the participants to share their thoughts with you.
- Knowing how and when to intervene (e.g., when the technology crashes, when the participant struggles to answer the question, or when the participant wanders off tasks).
- Distributing test materials (e.g., questionnaires, product reaction cards).

## CONSIDERATIONS FOR MODERATORS

The first few times you act as a moderator, you may find yourself experiencing the “stupid user syndrome” (see Chong, “The Pedagogy of Usability”; Johnson). Because you are familiar with (and may have even helped develop) the product, you believe that it is intuitive and easy to use. When a user struggles with the product, your first inclination may be to assume it is the fault of the user. It is important to be aware of the appearance of the “stupid user” syndrome, where the moderator may blame the participant for struggling with their tasks or wandering off of the tasks.

Likewise, moderators should avoid leading, confrontational, or unbalanced questions because these types of questions will not give you an accurate picture of your user’s experience with the product. For instance, if you ask, “Wouldn’t you agree that this button is misplaced?” you are suggesting that you already know what the user is thinking (and you may be wrong!). You could instead, revise this question to, “Where do you expect to see this button?” Examples of other questions you should *avoid* include the following:

- How difficult was that task for you? (Revised: “How easy or difficult was that task for you?”)

- Do you like the instructions? (Revised: “How did the instructions help you reach your goal?”)
- Why did you click that button? (Revised: “What made you click that button?”)

## CONSIDERATIONS FOR NOTETAKERS

The notetaker’s job is to log observations of the participant interacting with the product. Typically, the notetaker does not interact directly with the participant, but occasionally, the notetaker may ask clarifying questions (so that they can accurately record the participant’s reaction or statement). In this sense, the notetaker is largely an observer. Some usability tests use multiple notetakers. This enables the testing team to correlate findings after the test. However, some tests also include other individuals whose sole job is to observe. For example, if you are conducting a usability test for a corporation, members of the management team or product development team may simply observe the testing (but not take notes or perform any other specific task).

## ANALYZING THE FINDINGS

After conducting the test, there are three main questions that need to ask when analyzing the data (Barnum 239):

- What did you see?
- What does it mean?
- What should you do about it?

Similar to analyzing the primary research data in other projects, you will need to begin by gathering the data from everyone (e.g., moderator, notetakers, and observers). After gathering all your data, you will analyze your findings. Having more analysts will capture more problems and yield better findings (Sauro).

### EXAMPLE: ANALYZING THE FINDINGS OF THE FASTER FOOD MOBILE APP (SIMPLE)

To analyze the results of the “Faster Food” app simple usability test, you look at the data you collected from the participants’ think-aloud protocol statements. This data is found in the notes or transcript of the participants’ statements. Figure 11.6 shows these comments from three of the five participants who followed the think-aloud protocol while they completed our usability test.

Participant	Screen	Comment
Roxanne	home	<i>I like the color scheme for these icons.</i>
	restaurant	<i>How do I find out the ratings for this McDonald's? Oh, here it is.</i>
	menu	<i>How do I change my drink order to a Sprite?</i>
	order	<i>It is easy to put in the special instructions.</i>
<i>Do they take Apple Pay? I guess not.</i>		
Sean	restaurant	<i>The list is sorted by distance, so I always start with the closest McDonald's to campus. Nice.</i>
	order	<i>A lot of scrolling to find the drinks.</i>
		<i>I can save my credit card information, which is nice.</i>
Trisha	home	<i>Nice images.</i>
	restaurant	<i>I don't see McDonald's. Wait. next page.</i>
	menu	<i>Wow! It looks like the full menu is available for delivery.</i>

Figure 11.6: Example of Qualitative Findings

By creating a column that identifies the screen the participant was on when they made the comment, you could look for patterns in the data. For instance, Figure 11.6 shows that while on the restaurant selection screen, two of our participants initially questioned how to find a specific restaurant. This also shows that two participants gave favorable feedback on the home screen.

### EXAMPLE: ANALYZING THE FINDINGS OF THE FASTER FOOD MOBILE APP (ADVANCED)

For a more advanced usability test, which might include quantitative data, you would review this quantitative data in addition to the qualitative data described in the simple usability test. For example, you look at the specific number of times certain events occurred during the testing. Figure 11.7 indicates the events you are testing and the participants' scores:

Figure 11.7 shows some of the quantitative data from the usability tests. Notice that all three participants spent the least amount of time selecting the restaurant and the most amount of time changing the Diet Coke to a Sprite. Also, notice that the task of selecting the Big Mac Meal shows the most occurrences of using the “back” button, which may suggest that this screen is not as intuitive or user-centered as you would have expected.

Task	Number of times using the “back” button	Number of times returning to home page	Length of time to complete	Ease of use (1-5; 1=very unsatisfied, 5=very satisfied)
<b>Task 1: selecting the highest rated McDonald’s in the area</b>				
Roxanne	0	0	20 sec	4
Sean	1	0	22 sec	5
Trisha	1	0	31 sec	4
<b>Task 2: selecting the Big Mac value meal</b>				
Roxanne	1	0	40 sec	3
Sean	1	0	30 sec	4
Trisha	2	1	110 sec	2
<b>Task 3: changing the Diet Coke to a Sprite</b>				
Roxanne	0	0	42 sec	4
Sean	1	1	128 sec	1
Trisha	0	0	117 sec	3

Figure 11.7: Example of Quantitative Data

## DEVELOPING RECOMMENDATIONS

Once you gather and analyze the data from the usability testing, you will develop recommendations based on this data. For instance, if your data indicates that participants spent more time on a particular screen of your mobile app than you anticipated, you may recommend that the screen be redesigned. More specifically, if the data suggests a specific issue with that screen (the buttons were difficult to locate), you might recommend increasing the size of the buttons or adding a brighter color.

Your recommendations may be informally or formally presented depending on your audience (the person or group for whom you are conducting the usability test). If you are conducting a simple, think-aloud usability test, you may summarize your findings and recommendations in a couple of short paragraphs. If you are conducting an advanced usability test, you may be asked to create an executive summary of your recommendations. The executive summary simply documents the issue and your recommended fixes. The test data and your analysis, which support your recommendations, can be attached to the executive summary so that they are available, if needed.

## EXAMPLE: DEVELOPING THE EXECUTIVE SUMMARY FOR THE FASTER FOOD MOBILE APP USABILITY TESTING

Figure 11.8 shows the executive summary of the “Faster Food” app advanced usability testing. This summary includes an introduction to the project, a brief summary of our methods and findings, and the recommendations that these findings suggest.

**Executive Summary: Faster Food Mobile App Usability Testing**

**Introduction**  
 The Faster Food mobile application assists users who want to order food from local fast food restaurants to be delivered to them. Our users are adults aged 18 and older who have experience using mobile apps, though this experience level may vary. Our usability testing involved five representative users between the ages of 19 and 50. The testing was performed in our Rochester, Michigan lab.

**Summary of Methods**  
 We used a combination of qualitative and quantitative methods to gather our data. Qualitative participant data was gathered by recording the statements made while the participants were following the think-aloud protocol while completing Scenario 1 of our test. Quantitative participant data was gathered by looking at the number of times certain events happened during the testing, such as the participant selecting the back button or returning to the home page.

**Summary of Findings**

*Positive Findings*

- Four of five users found the app attractive, two citing the “color scheme” and “images.”
- All five users found the checkout process easy, where they can easily enter their addresses, special instructions, and credit card information.
- Three of the five users found that selecting the desired restaurant was straight-forward.

*Negative Findings*

- Four of the five users found that the ordering screen was difficult to navigate, and there was a higher-than expected use of the “back” button on this screen.
- Three of the five users found making changes to the orders to be cumbersome.

**Recommendations**

- Due to the high number of participants commenting on the attractiveness of the app, we recommend retaining the color scheme and icons currently being used.
- To address the number of times the participants use the “back” button on the ordering screen, we recommend adding a large button that reads “change my order.”
- Because some of the users had a difficult time finding the closest, highest-rated restaurant to them, we recommend adding an algorithm that default to this selection on the restaurant selection screen.

Figure 11.8: Example of Executive Summary

## CONCLUSION

In this chapter, we explain the importance of understanding users and provide basic guidelines for designing and piloting a test plan, recruiting participants, preparing test materials and environment, conducting the test, analyzing the findings, and developing recommendations. We provide examples of both a simple, think-aloud protocol usability test (that

includes qualitative data) and a more extensive usability test (that includes both qualitative and quantitative data). In summary, usability testing is a crucial tool to add to your skillset as a technical communicator, and it is important to solicit as much user input and as often as possible during the product development process.

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## TEACHER RESOURCES

### OVERVIEW AND TEACHING STRATEGIES

There are various models for implementing a usability testing project in the classroom. Ideally, this project should be taught in a dedicated usability course to allow students time to develop the skills involved in usability testing. If, however, you must implement the usability test as one of the major projects as part of another class (such as technical writing), we recommend that you identify one project or a reliable or responsive client for all student teams (instead of trying to manage several projects/clients).

Just as with other types of primary research, students must learn how to effectively collect user data and analyze it, so it is crucial for you to support them by giving them timely and useful feedback (e.g., on their test plans) prior to the test. Also, be sure to allow ample time for all phases of the project, as many may underestimate the amount of time required for various tasks (such as recruiting and scheduling participants) and the iterative nature of other tasks (such as analyzing data). It is also important to select participants for the usability test who match the user profile, but it is often a step that is easily skipped or underestimated. Therefore, you should allow ample time for students to recruit users.

### DISCUSSION QUESTIONS

Following are discussion questions that will allow your students to explore the ideas discussed in this chapter:

- What kind of primary research studies have you participated in in the past?
- What type of experience do you have creating personas?
- What do you think are the major challenges involved in conducting a usability study?
- What methods are you most likely going to use to recruit participants?
- What are some current issues on your campus or in your field that could be investigated with this usability testing method?
- How could usability fit into your major field of study?

### SUGGESTED WEBSITES FOR REMOTE TESTING

With the advent of online education and testing, here is a list of websites for conducting tests online or remotely:

- Usabilityhub.com



- [OptimalWorkshop.com](http://OptimalWorkshop.com)
- [UserTesting.com](http://UserTesting.com)

### SUGGESTED READINGS

Here is a list of suggested readings for you to learn more about user-centered design and usability tests:

- Barnum, Carol. *Usability Testing Essentials: Ready, Set . . . Test!* Elsevier, 2011.
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