

Design thinking and User experience

Software Engineering

Contents

- **Plan** and **conduct** moderated and unmoderated usability studies.
- **Synthesize** observations from usability studies and come up with insights.
- **Share** research methodology and insights using persuasive presentation skills.
- **Modify** low-fidelity designs based on research insights.

Modules



Planning UX research studies.



Conducting research with usability studies.



Analyzing and **synthesizing** research results.



Sharing research insights for better designs



Conduct UX Research and Test **Early Concepts**

Review where we're at in the UX design process:

Learned: how to **empathize** with users; **define user needs** and **problem statements**; **ideas for design** solutions

Created: a **wireframe** and made your way into the **low fidelity prototype**.



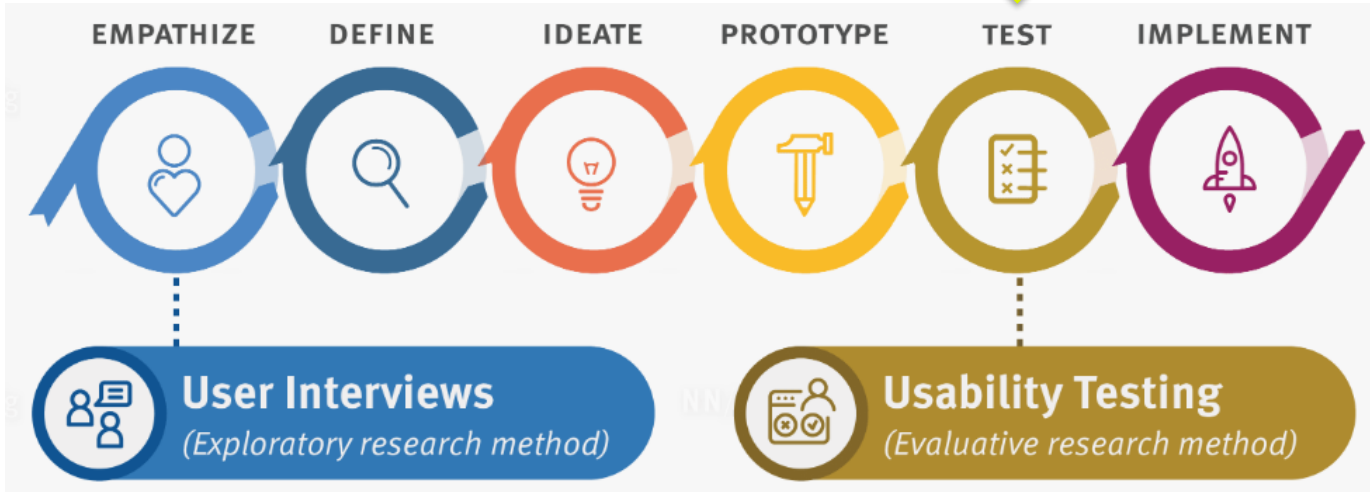
Going to learn how to **conduct research to test your prototype**. Once you have your research findings, you'll **use the insights to iterate** on and **improve your low-fidelity designs**.



Conduct UX Research and Test Early Concepts

Where we're at in the UX design process:

conduct research to test your prototype.



Modules



Planning UX research studies



Conducting research with usability studies



Analyzing and synthesizing research results



Sharing research insights for better designs



Planning UX research studies

Understand the UX research process:

Research study is a step-by-step **examination of a group of users and their needs**, which adds **realistic context** to the design process.

Four steps in a UX research study:

- Plan the study
- Conduct the research
- Analyze and synthesize the results
- Share and promote the insights.

Reading: Language and communication in UX research.docx



Planning UX research studies

Build a UX research plan

Elements of a UX research plan:

1. Project background
2. Research goals
3. Research questions
4. Key Performance Indicators (KPIs)
5. Methodology
6. Participants
7. Script

Reading: UX-Research-Study-Plan-Template.docx



Planning UX research studies

Build a UX research plan

- **Title:** The focus of your study.
- **Author:** your full name, job title, and email address on one line.
- **Stakeholders:** Add stakeholder names and roles.
- **Date:** The date that the plan was last updated.
- **Project background:** What led you to conduct this research?
- **Research goals:** What design problems are you trying to solve for the user and/or the business? How will the results of the research affect your design decisions?
- **Research questions:** What are the questions your research is trying to answer? (5 research questions is a solid place to start. Do not include more than 7-10 research questions.)



Planning UX research studies

Build a UX research plan

- **Key Performance Indicators (KPIs):** How can you measure progress toward the research goals? might include: Time on task, use of navigation vs. search, user error rates, drop-off rates, conversion rates, system usability scale (SUS)..

Reading: Learn more about KPIs.Docx



Planning UX research studies

Introduction

- **Title:** Creating CoffeeHouse ordering app
- **Author:** Ali, UX researcher, ali@coffeehouse.design
- **Stakeholders:** CoffeeHouse customers, Gael Esparza—CTO, Linda Yamamoto—VP of Design
- **Date:** 12/14/2020
- **Project background:** We're creating a CoffeeHouse app to help people place and pick up multiple CoffeeHouse orders together at once, so they can skip in-store lines and the payment process is streamlined. Some patrons place orders for groups and ordering individually takes too long.
- **Research goals:** Figure out if collaborative ordering in the app actually saves people time when placing group orders.

Research questions

- How long does it take for 4-5 people to make a collaborative group order?
- What can we learn from the steps users take to order as a group, and on their own?

Key Performance Indicators (KPIs)

- Time on task
- User error rates
- Conversion rates



Planning UX research studies

Build a UX research plan

Methodology: the steps you take to conduct your research.

- Procedures for the test
- Time and location
- Person conducting the test
- Way the test will be conducted

The reasons to include methodology in research plan:

- Informs stakeholders, what will happen during the study, how long the study is, and where it will take place.
- Give stakeholders more confidence because they can see all of the steps
- Provides the details that other researchers need to repeat the exact same study in the future



Planning UX research studies

Build a UX research plan

- **Methodology:** the steps you take to conduct your research.

Methodology

- Unmoderated usability study
- Location: United States, remote (participants will go through the usability study in their own homes).
- Date: Sessions will take place on February 8 & 9
- Five participants complete the collaborative ordering tasks on their own. One of the participants is randomly chosen to submit the group order. Each participant completes a questionnaire on their experience privately.
- Each session will last 45 minutes, and will include an introduction, a list of tasks, and a short questionnaire.



Planning UX research studies

Build a UX research plan

- **Participants:**
 - Who will you include in this study?
 - What characteristics do the participants have?
 - Why did you choose them?

If you're intentionally including specific populations (e.g., users with diverse abilities and perspectives), be clear about the needs of the study.



Planning UX research studies

Build a UX research plan

- **Participants:**

Participants	<ul style="list-style-type: none">• Participants are people who place group coffee orders at least twice a month, whether it's a business task or a social task. This could be for office meetings, friend groups, or family.
	<ul style="list-style-type: none">• They don't have to be coffee drinkers themselves• 2 Male, 2 Female, 1 Nonbinary, all aged 20-75 years old<ul style="list-style-type: none">◦ 1 user of assistive technologies (keyboard, screen reader)• Incentive: \$10 CoffeeHouse gift card redeemable at any location or online
	<ul style="list-style-type: none">• Intro:<ul style="list-style-type: none">◦ Before we begin, do I have your consent to take both audio and video recordings of this interview?◦ I want you to know that this isn't a test. There is no "right" answer, and none of your responses will be considered wrong.◦ If you have any questions, please don't hesitate to ask.◦ This data is being collected to help create an app that makes ordering coffee easier. Your answers will help us make the app easier for people to use.◦ Basic questions:<ul style="list-style-type: none">■ Do you live in an area with lots of coffee shops?■ Do you have a favorite coffee shop?■ How many times a week do you order coffee from a store?■ Do you usually order for yourself, or for a group?■ Can you talk me through a normal day in your life?◦ Great! If you're ready, let's move onto the tasks you'll be working on.



Planning UX research studies

Build a UX research plan

Script: What questions will you ask study participants?

- Interviewing users isn't just chatting with people; it's about getting to the core of what a user is trying to do, how they think and feel, and what their problems are.
- Interview questions:
 - Well thought out
 - Consistent between the participants
 - Purposeful to get the data you need for useful insights.



Planning UX research studies

Build a UX research plan

Script:

Script

- **Prompt 1:** Open up the CoffeeHouse app on your phone and customize a drink order for yourself. Do your best to talk me through your thought process.
 - **Prompt 1 Follow-Up:** How easy do you feel it is to customize a drink the way you like it? What was easy and what was challenging?
- **Prompt 2:** If I said, "start a new group order," would you know what to do?
 - **Prompt 2 Follow-Up:** Try it out now, please.
 - **Prompt 2 Follow-Up:** Did you find anything confusing?
- **Prompt 3:** From the existing group order screen, add your custom drink from a moment ago, then add multiple other custom drinks to the same order and proceed to the checkout screen.
 - **Prompt 3 Follow-Up:** How do you feel about the process of purchasing multiple drinks in the same order? What was easy and what was challenging?
- **Prompt 4:** Finally, checkout and complete the group order.
 - **Prompt 4 Follow-Up:** How do you feel about paying for different orders in the same transaction? What are your feelings about the

amount of time it took to complete?

- **Prompt 5:** How did you feel about the CoffeeHouse app overall? What did you like and dislike about it?



Planning UX research studies

Respect user privacy and data:

- It's the right thing to do
- Privacy laws and ethics
- Risk of hacking
- Protecting your company's brand



Planning UX research studies

Respect user privacy and data

Two main types of data you need to protect:

Personally Identifiable Information (PII)

Specific details that could be used to identify a user

- Names
- Home addresses
- Email addresses
- Phone numbers

Sensitive Personally Identifiable Information (SPII)

Data that, if lost, compromised, or stolen, could cause your users financial harm, embarrassment or discrimination

- Social Security numbers
- Driver's licenses
- Passport numbers
- Financial account numbers
- Date of birth
- Race
- Disability status
- Gender
- Sexuality
- Criminal history
- Medical information



Planning UX research studies

Respect user privacy and data

Privacy and security a part of your UX design and research practices:

- Be transparent about data collection.
- Only collect user data that's absolutely essential.
- Get active consent.
- Detail how you'll use participants' information and protect privacy.
- Allow users to withdraw at any time.
- Inform users of who will have access to their data.
- Explain how you plan to store and delete users' data.



Planning UX research studies

Privacy issues

Vulnerable populations:

- Groups of people who have limited ability to provide their consent or have special privacy concerns
- Ask a research expert what additional steps you need to take to remain ethical and compliant with privacy law
- Consider the safety of research data:
 - Document your study and results in a way that's consistent with UX research standards.
 - Make sure that your data is held in a way that is safe from hacking and safe and Physical Damage
 - How long you and your company hold onto research data

Modules



Planning UX research studies



Conducting research with usability studies



Analyzing and synthesizing research results



Sharing research insights for better designs



Conducting research with usability studies

Introduction to usability studies

Usability study: A research method that assesses how easy it is for participants to complete core tasks in a design.

Usability studies can take place at various points in the design process:

- When you have an early idea (lo-fi prototype)
- When you have an interactive prototype
- When a product that is complete

User's feedback helps the design team make important improvements to the user experience



Conducting research with usability studies

Moderated and Unmoderated usability studies

Moderated usability studies : moderator, guide participants through the study in real time.

Moderated usability study

Researcher



- Administers tasks
- Observes participant
- Interviews participant

Participant



- Performs tasks
- Gives researcher feedback

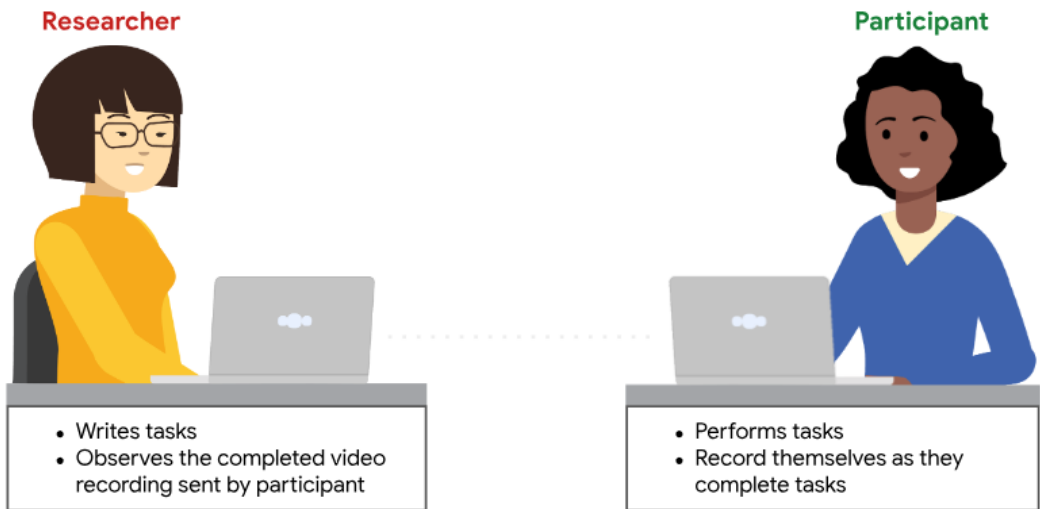


Conducting research with usability studies

Moderated and Unmoderated usability studies

Unmoderated usability studies : participants test the prototypes without human guidance and move through the study at their own pace and often in their own environment.

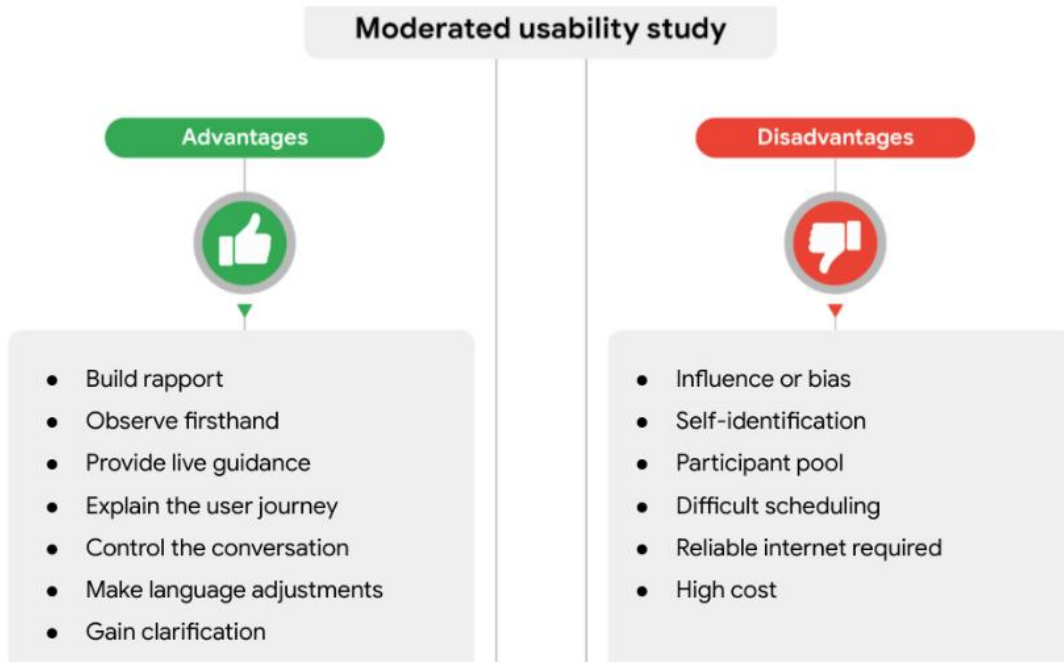
Unmoderated usability study





Conducting research with usability studies

Moderated and Unmoderated usability studies





Conducting research with usability studies

Moderated and Unmoderated usability studies

Unmoderated usability study

Advantages



- Natural product interactions
- More participants
- Easier scheduling
- Inexpensive
- More privacy
- Simple user journeys

Disadvantages



- No real-time support
- No live follow ups
- Potential distractions
- Possible privacy breaches
- Inaccessibility
- More data to analyze
- Simple user journeys only



Conducting research with usability studies

Observe a mock unmoderated usability studies

Insert Video with Vietnamese subtitle



Conducting research with usability studies

How to begin a moderated usability studies

- Build a rapport with participants
- Thank participants for coming
- Remind participants to be open and honest
- Have participants fill out paperwork
- Explain the focus of the study and what participants will give feedback on
- Establish the ground rules for the study
- Remind participants that they are not being tested



Conducting research with usability studies

Techniques for moderation during the usability study

- Ask open-ended questions
- Ask follow-up questions
- Summarize their answer for confirmation.

Reading

- [Explore the advantages and disadvantages of usability studies.docx](#)
- [Learn more about usability studies.docx](#)
- [Learn more about usability study best practices.docx](#)



Conducting research with usability studies

Identify biases when interviewing usability study participants

Reading

[Learn more about reducing bias in interviews.docx](#)

- **Implicit bias:** the collection of attitudes and stereotypes we associate to people without our conscious knowledge.
- **Serial position effect:** when given a list of items, people are more likely to **remember the first few and the last few** while the items in the **middle tend to blur**.
- **Friendliness bias:** the tendency of people to agree with those they like in order to maintain a nonconfrontational conversation.
- **Social desirability bias:** which describes the tendency for people to answer questions in a way that will be viewed favorably by others.



Conducting research with usability studies

Reducing bias in interviews

Confirmation bias



- **Recruit an appropriate sample size:** UX researchers want to have five to eight participants when conducting a usability study
- **It's not about your beliefs:** If participants share ideas that contradict your assumptions, it could highlight the need to dig into an issue more deeply and can pave the way for new learnings to emerge.



Conducting research with usability studies

Reducing bias in interviews

Leading questions



framed to guide participants to respond in a certain way

To **avoid leading questions**:

- **Encourage participants to think aloud:** Ask interviewees to share all of their thoughts as they review a product.
- **Limit your responses:** try not to offer your own opinions



Conducting research with usability studies

Reducing bias in interviews

Friendliness bias



Friendliness bias describes the tendency of people to agree with those they like in order to maintain a non-confrontational conversation.

To **avoid Friendliness bias**:

- Honesty is the best policy
- Stay consistently engaged



Conducting research with usability studies

Reducing bias in interviews

Social desirability bias



Social desirability bias describes the tendency for people to answer questions in a way that will be viewed favorably by others.

To **avoid social desirability bias**:

- Conduct 1:1 interviews
- Ensure confidentiality



Conducting research with usability studies

Reducing bias in interviews

Hawthorne effect



The Hawthorne effect describes how people tend to act differently when they know they're being watched.

To **avoid Hawthorne effect**:

- Create a non-threatening environment
- Establish rapport



Conducting research with usability studies

Introduction to note-taking methods during usability studies

Why we take notes during a usability study, especially if the session is being recorded?

- First: To capture any thoughts you have during the usability study
- Second: To summarize a participant's experience during the study
- Third: To highlight really compelling quotes to include in your research report



Conducting research with usability studies

Introduction to note-taking methods during usability studies

Use a spreadsheet to take notes

- Entire usability study in one place
- Easy to remember a specific detail

Five categories in the note-taking spreadsheet:

Participant's Name				
Task	Click Path	Observations	Quotes	Task Completion
Write the task number and directions here.	Record what path the participant took to complete the task.	Note down behaviors, opinions, and attitudes along with any errors, issues, or areas of confusion.	Note any significant quotes (positive and negative).	Choose if the task was: 1 - easy to complete 2 - completed but with difficulty 3 - not completed

Modules



Planning UX research studies



Conducting research with usability studies



Analyzing and synthesizing research results



Sharing research insights for better designs



Analyzing and synthesizing research results

Make insights from observations: **analyze** and **synthesize** the results

Insight: an observation about people that helps you **understand the user** or **their needs** from a new perspective.

How can we come up with a list of insights?

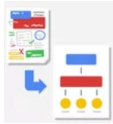
- Gather all of the data from our usability study in one place
- Organize the data
- Find themes in the data. One of the key goals of user research is to identify themes that are common across participants.
- Come up with insights for each theme (synthesis)



Analyzing and synthesizing research results

Fill in the blank: Researchers need to transition data they receive from observations to insights. To do this, they first need to _____ all the data from the usability study in one place

- ☐ analyze
- ☐ organize
- ☐ gather
- ☐ categorize



Analyzing and synthesizing research results

Once researchers identify common themes in the data, what is the next step?

- Identify outliers and compare them to the common themes.
- Write an insight that tells the design team how to improve the product based on each theme.
- Develop a hypothesis for a product improvement based on each theme.
- Create an affinity diagram to organize the data for each theme.



Analyzing and synthesizing research results

When UX designers synthesize data, what are they doing? Select all that apply.

- ☐ Understanding methods of data collection
- ☐ Combining ideas to draw conclusions
- ☐ Collecting assumptions about users
- ☐ Evolving their understanding of user problems



Analyzing and synthesizing research results

What is the difference between traditional and field research?

- Traditional research focuses on collecting first-hand observations, while field research prioritizes data collection.
- Field research focuses on collecting first-hand observations, while traditional research concentrates on compiling data.
- Traditional research focuses on defining trends in the marketplace, while field research collects data on those trends.
- Field research focuses on quality checking potential design features, while traditional research observes them.



Analyzing and synthesizing research results

Gather, organize and reflect on data

- Gather everyone sticky notes in one place
- Organize the data so that it's easier to interpret or understand

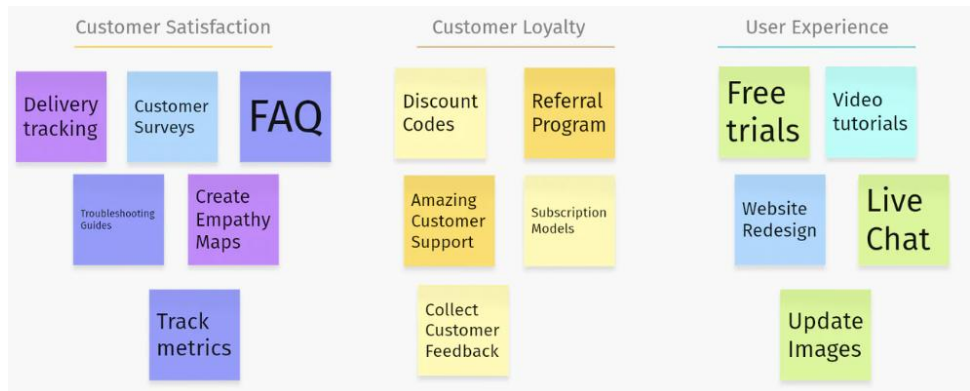
One method you can use to organize data is called
affinity diagramming



Analyzing and synthesizing research results

Gather, organize and reflect on data

- **Affinity diagram:** a method of **synthesizing** that **organizes data into groups** with **common themes** or **relationships**.
- In the real world affinity diagramming is often done as a team
- You need all of the observations from participants to be on sticky notes.



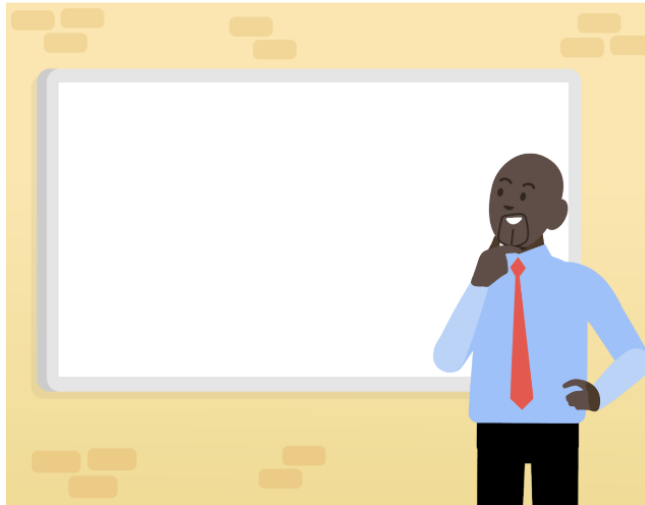


Analyzing and synthesizing research results

Gather, organize and reflect on data - Affinity diagram

Step by step:

1. Find a place to a large space to put all of your sticky notes



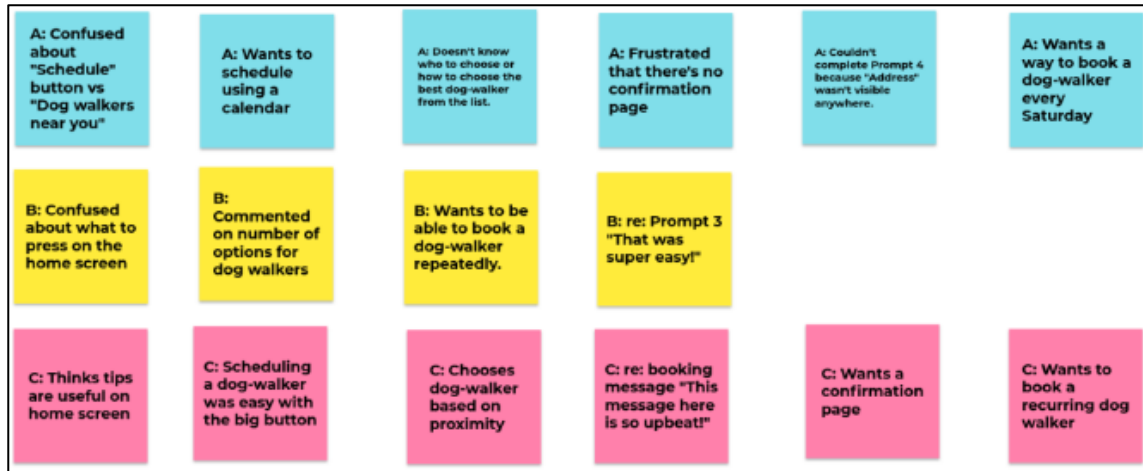


Analyzing and synthesizing research results

Gather, organize and reflect on data - Affinity diagram

Step by step:

2. Create sticky notes: Each sticky note lists a single idea, observation, or direct quote from a participant



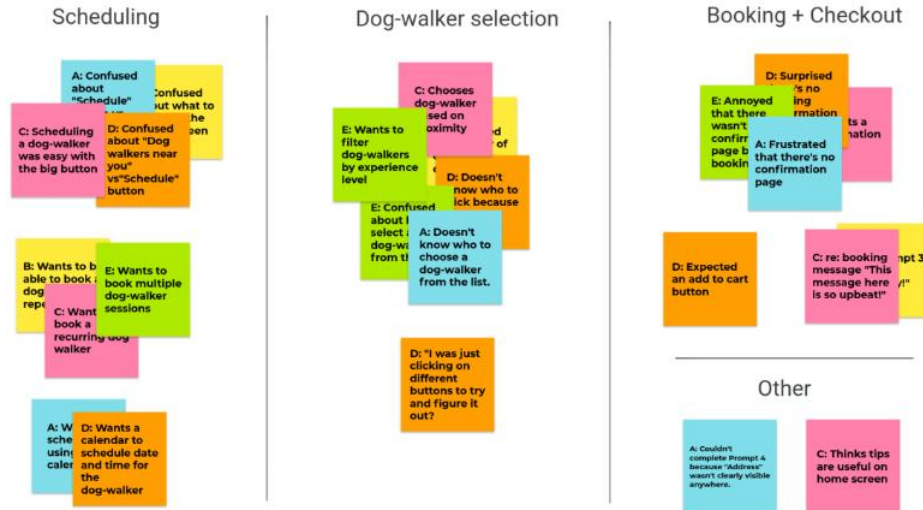


Analyzing and synthesizing research results

Gather, organize and reflect on data - Affinity diagram

Step by step:

- Put sticky notes in groups: cluster the observations and quotes into groups



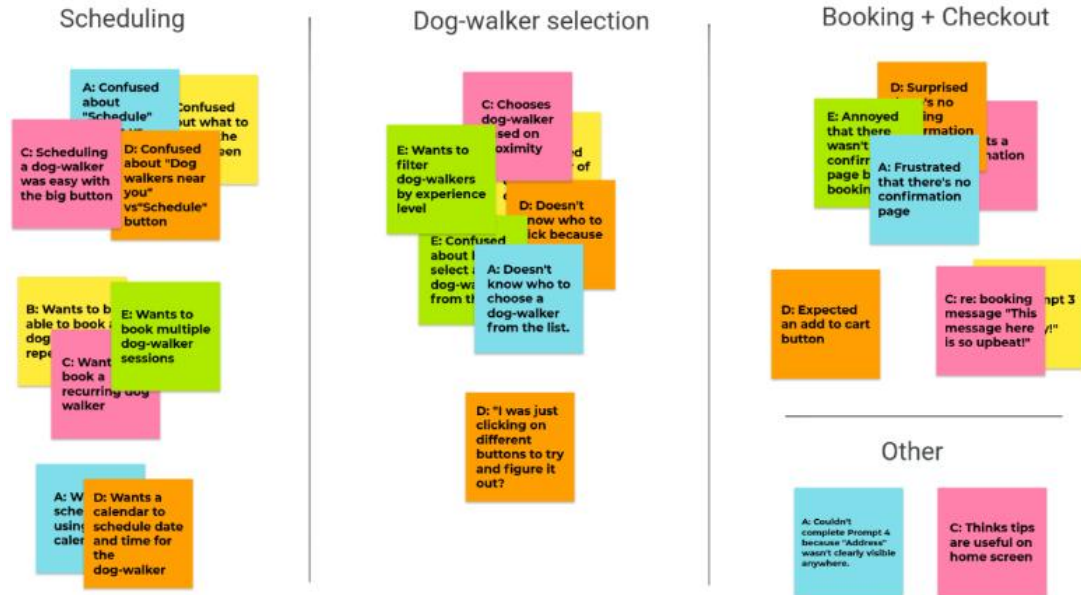


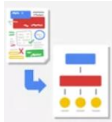
Analyzing and synthesizing research results

Gather, organize and reflect on data - Affinity diagram

Step by step:

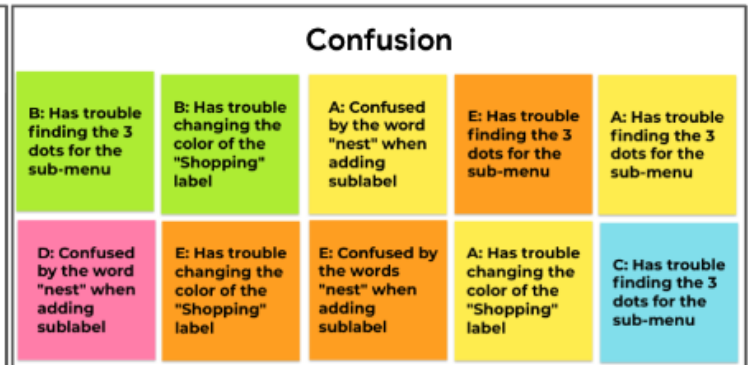
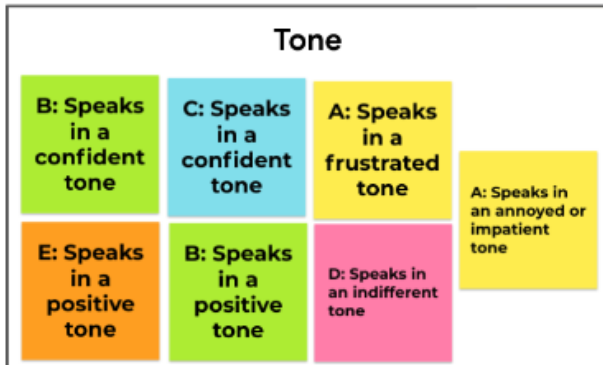
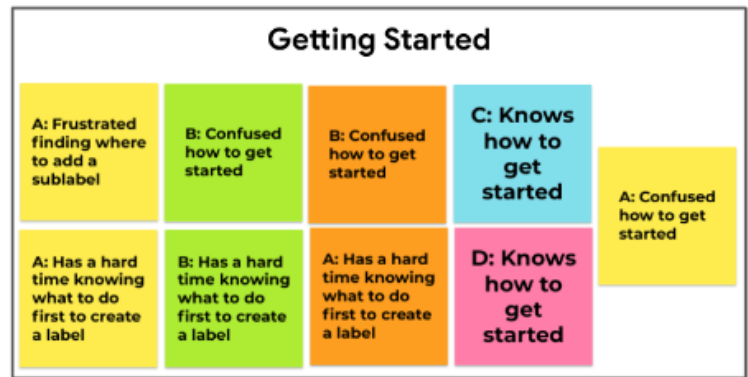
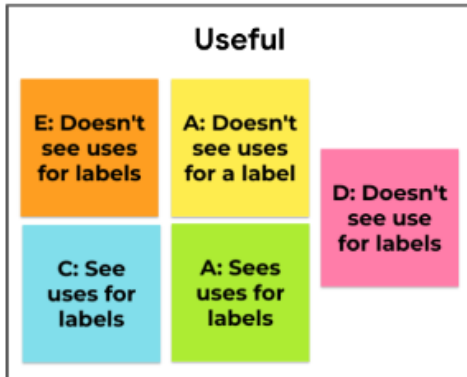
4. Continue until there are no sticky notes remaining

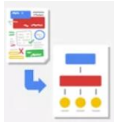




Analyzing and synthesizing research results

An affinity diagram for the Gmail labels feature project





Analyzing and synthesizing research results

Find **patterns** and **themes** in research data

What common patterns have you identified in the data that you've collected?

Areas of the affinity diagram with multiple sticky notes usually represent a pattern and later each pattern becomes a theme.

pattern 1: recurring dog walkers or multiple sessions.

Scheduling

A: Confused about "Schedule" button
D: Confused about "Dog walkers near you" vs "Schedule" button
C: Scheduling a dog-walker was easy with the big button

B: Wants to be able to book a recurring dog walker
E: Wants to book multiple dog-walker sessions
C: Want to book a recurring dog walker

A: Wants a scheduler to use calendar date and time for the dog-walker
D: Wants a calendar to use schedule date and time for the dog-walker

Booking + Checkout

D: Surprised there's no confirmation page
E: Annoyed that there wasn't a confirmation page
A: Frustrated that there's no confirmation page
D: Expected an add to cart button
C: re: booking message "This message here is so upbeat!"

pattern 2: frustrations about there not being a confirmation page.

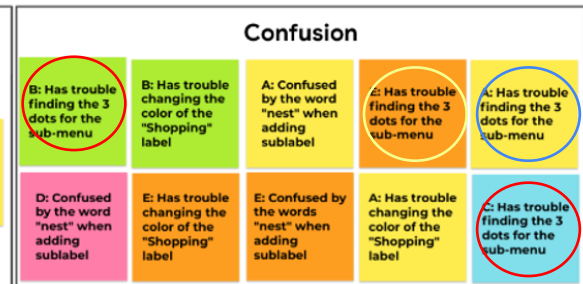
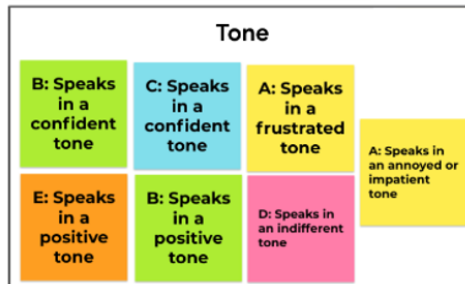
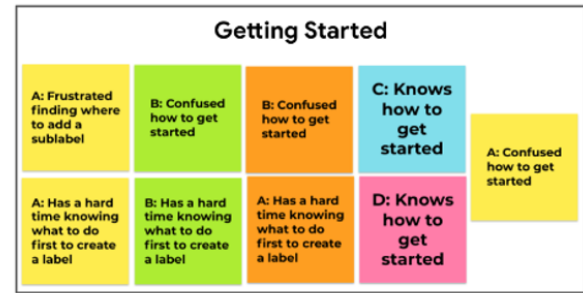
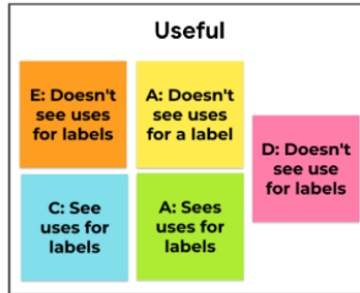


Find **patterns** and **themes** in research data

What common patterns have you identified in the data that you've collected?

An affinity diagram for the Gmail labels feature project

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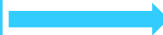
Analyzing and synthesizing research results

Find **patterns** and **themes** in research data

What these patterns tell us about the products design?

Connecting the pattern to the user's experience is the best way to do this

pattern 1: recurring dog walkers or multiple sessions.



theme: Most participants feel that being able to make a re occurring booking would offer them more options on the app.

pattern 2: frustrations about there not being a confirmation page.





Analyzing and synthesizing research results

Qualities of strong insights

What makes an insight strong?

- grounded in **real data**
- need to **answer the research questions** you listed in your research plan.
- should be **easy to understand**.
- **increase empathy** for the user experience.
- **inspire** direct action.

Based on the theme that: **most users were unsure how to change the color of a label**, an insight is: **users need better cues for what steps are required to change the color of a label.**

Modules



Planning UX research studies



Conducting research with usability studies



Analyzing and synthesizing research results

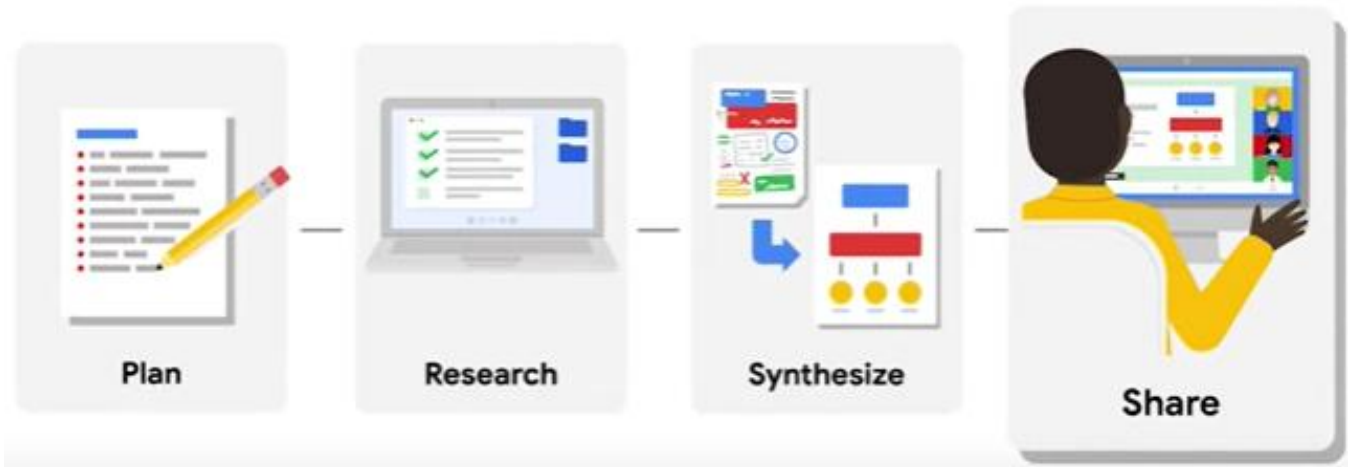


Sharing research insights for better designs



Research sharing methods

Organize insights for sharing





Research sharing methods

Organize insights for sharing

Insights

observations about people that help you understand the user or their needs from new perspectives.

sharing your insights: a presentation and a research report.

Two different formats you can use to share your insights: **Presentation; Research report**



Research sharing methods

Choose a format for sharing insights



A presentation is a group of slides where each slide has new information.

Presentations provide your stakeholders with a **high-level overview** of the project.



Research sharing methods

Tips for creating a strong presentation: **Know your audience**





Research sharing methods

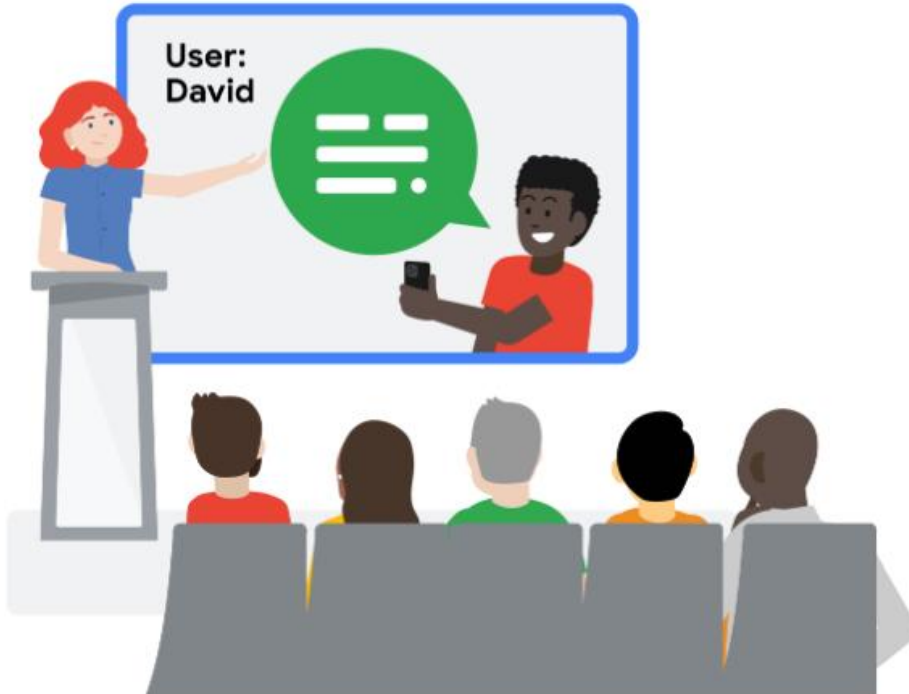
Tips for creating a strong presentation: **Provide an overview**





Research sharing methods

Tips for creating a strong presentation: **Tell a story**





Research sharing methods

Tips for creating a strong presentation: **Show numbers**





Research sharing methods

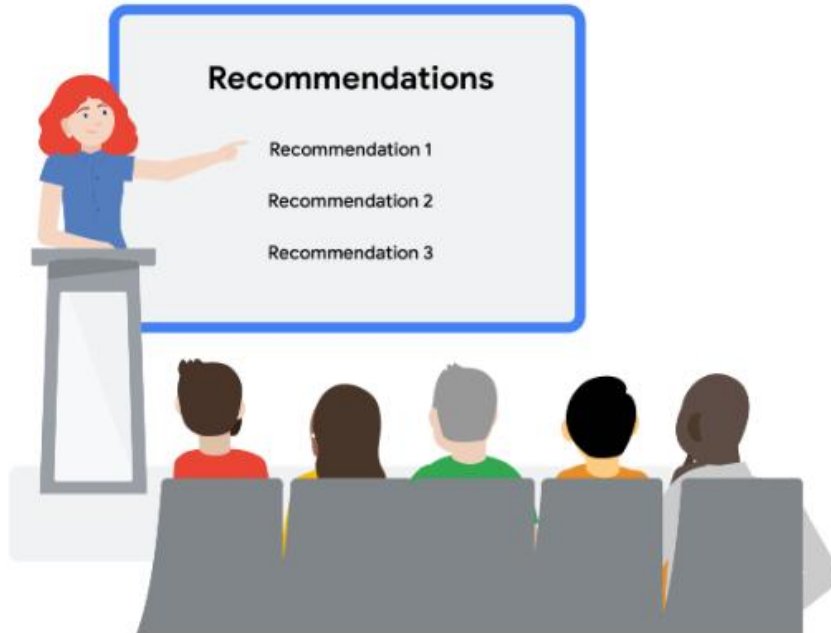
Tips for creating a strong presentation: Less is more when it comes to text





Research sharing methods

Tips for creating a strong presentation: **Provide recommendations for next steps**





Research sharing methods

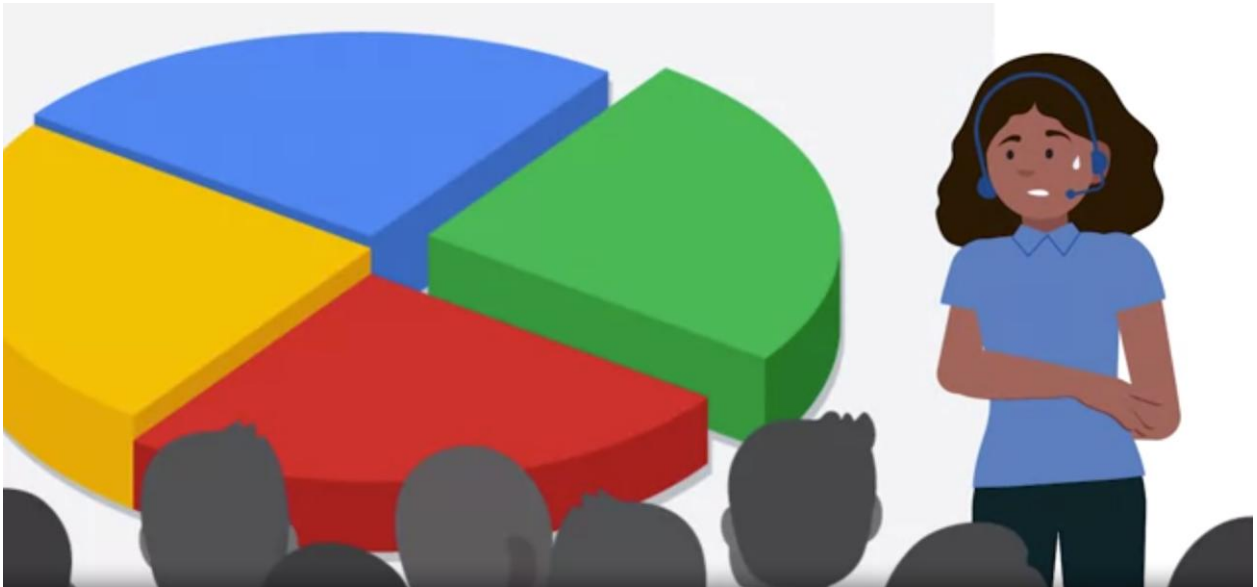
Tips for creating a strong presentation: Leave time for questions





Present Research Insights

Tips for giving an effective presentation





Present Research Insights

Tips for giving an effective presentation: **put in the time to practice**





Present Research Insights

Tips for giving an effective presentation: Speak clearly and slowly

A common side effect of being nervous while presenting is that you might start to speak too fast. You want the audience to be able to understand everything you say and have time to digest it. So, it helps to pace yourself while you speak. You might even consider tapping your toe within your shoe to keep a rhythm while you speak.



Present Research Insights

Tips for giving an effective presentation: Allow for pauses

Pauses display confidence and help set the pace for your presentation. Some ideal times to stop for a pause include when you pose a question to the audience or when you transition to a new section of your presentation. Adding a meaningful pause is also a great way to make sure that you aren't speaking too quickly.



Present Research Insights

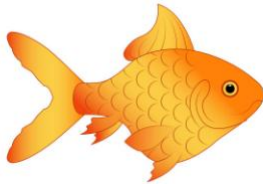
Tips for giving an effective presentation: Make eye contact

As you present, try to make eye contact with different people in the audience. Make eye contact with one person for 3-5 seconds before moving on to the next person. This helps you connect with members of the audience and keeps everyone engaged in your presentation.



Present Research Insights

Tips for giving an effective presentation: Be concise



While it's great to use stories and data to keep your audience engaged, be sure that everything you share adds value to your presentation. Keep the information you present concise and to the point.



Present Research Insights

Tips for giving an effective presentation: Have confident body language

You should move naturally in the free space that you have, and move around the room to engage your audience. Smile and nod as you speak to put your audience at ease. Avoid crossing your arms, having your hands in your pockets, or playing with your hair or clothes.



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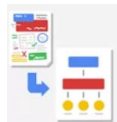
Change designs using new insights

You have a presentation or report filled with insights from your research. You've also shared those insights with stakeholders and agreed on the ones to take action on. The next step is to improve your designs based on what you've learned.



Change designs using new insights

- Each time you learn about a pain point, there's an opportunity to update the design and make the experience better for users.
- How do you know which insights to use to update your design?
- It's helpful to prioritize your research insights from the most urgent to the least urgent.



Change designs using new insights

Prioritize your research insights with project stakeholders such as a fellow designer, product manager, or a lead engineer

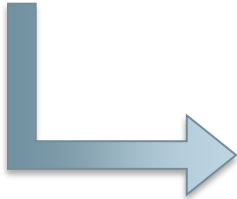
P0: must be fixed for your product to work

- any parts of the design that prevented the user from completing the main user flow.
- were there parts of your design where users felt tricked, this might indicate a deceptive pattern
- were there any parts of your design that were inequitable or inaccessible



Change designs using new insights

In addition to priority 0, you might have buckets called priority 1 and priority 2.



Next step, We'll modify our low fidelity designs based on insights from a usability study.