





# Roadmap



**01** Intro to keynotes

**02** Sketching Overview

**03** Selected Interface

**04** Low-Fi Prototype

**05** Testing

**06** Discussion





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# Reminder of Our Ensemble!



**Will Fang**

CS AI '25  
French Horn!



**Julia Hernandez**

SymSys HCI + Soc '24  
Viola!



**Emily Macias**

CS HCI '25  
Guitar!



**Aditi Tuli**

SymSys Neuroscience '25  
Piano!

Unlocking Potential

Musical Notes

# keynotes

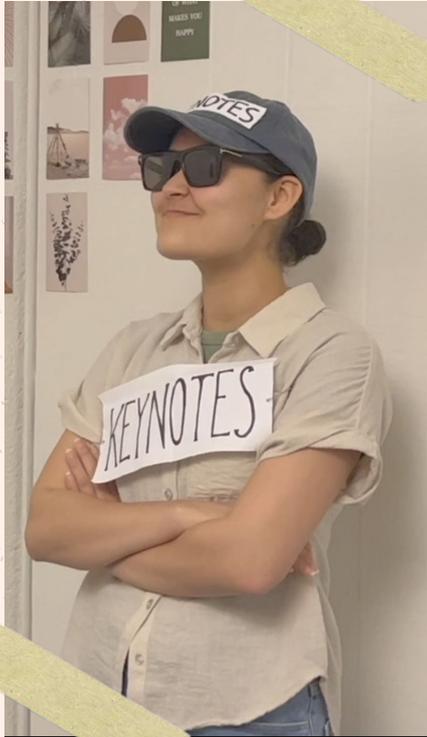
Helping users get key notes on their playing

The background is a light pink color with a fine, dotted pattern. It is decorated with various musical and abstract elements: a yellow musical note in the top left, a blue musical note below it, a blue circle on the left side, a yellow and orange abstract shape at the bottom left, a red treble clef on the right side, a light blue musical note at the bottom right, a red abstract shape at the bottom right, and a cluster of four dark blue dots at the bottom right. A large, light pink L-shaped graphic element frames the text below the title.

# Where feedback strikes a chord

Getting constructive feedback that fosters connections, striking just the right 'chord'

# What is keynotes?



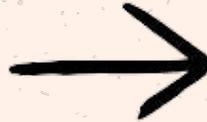
## Our Value Proposition:

Creates a platform where  
**musicians can connect and  
obtain crowdsourced and  
one-on-one feedback**

# The Problem + Solution

## **Problem:**

Musicians struggle to find reliable sources of feedback, which impacts their confidence and self-perception



## **Solution:**

A platform where musicians can connect and obtain one-on-one and crowdsourced feedback

From...

7

**Needfinding Interviews**

9

**POVs**

47

**HMWs**

70

**Solution Ideas**

7

**EP Testers**

## We learnt...

Musicians struggle to **break into existing support networks**

Amateur musicians feel **insecure** about their **amateur status**

**Feedback** improves a musician's **confidence** and **sense of self**

However, musicians struggle to find **consistent, trustworthy** sources of feedback

## From our experience prototype:

It's possible to facilitate **productive** and **encouraging** feedback given certain conditions:

- **Rapport** between musicians
- **Compatible** musical backgrounds and similar experience levels
- **Structured** and **constructive** feedback



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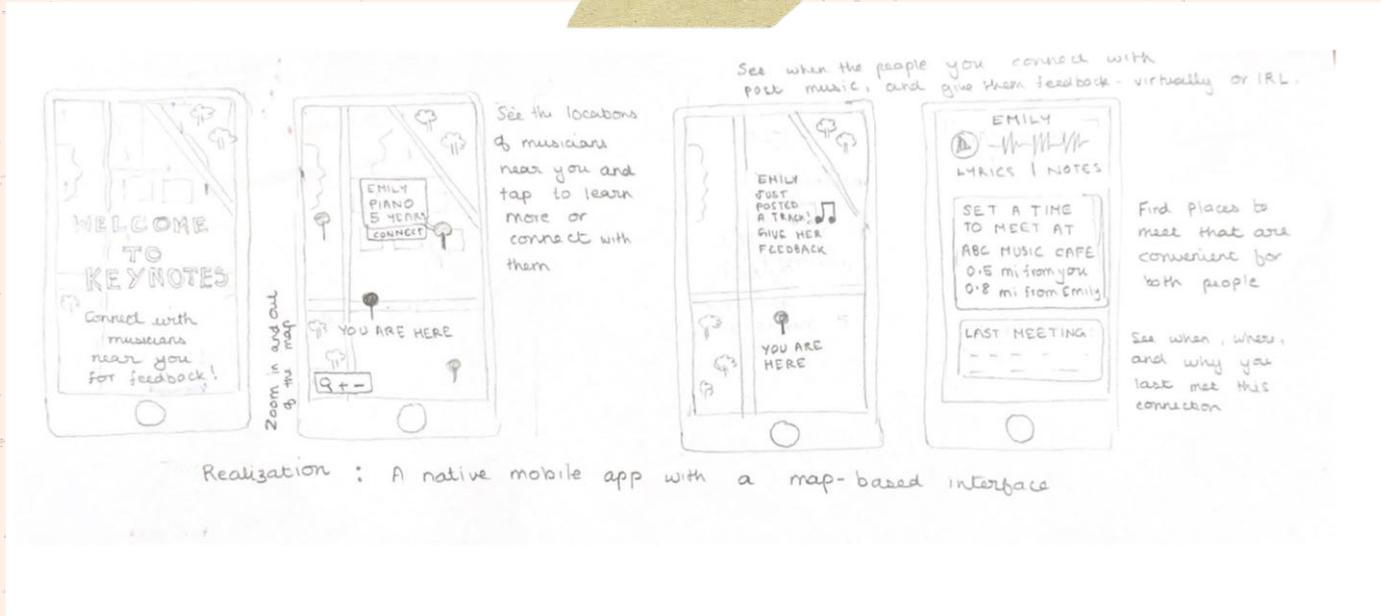
**05** Testing

**06** Discussion



# Realization 1

## Native mobile app with a map-based interface

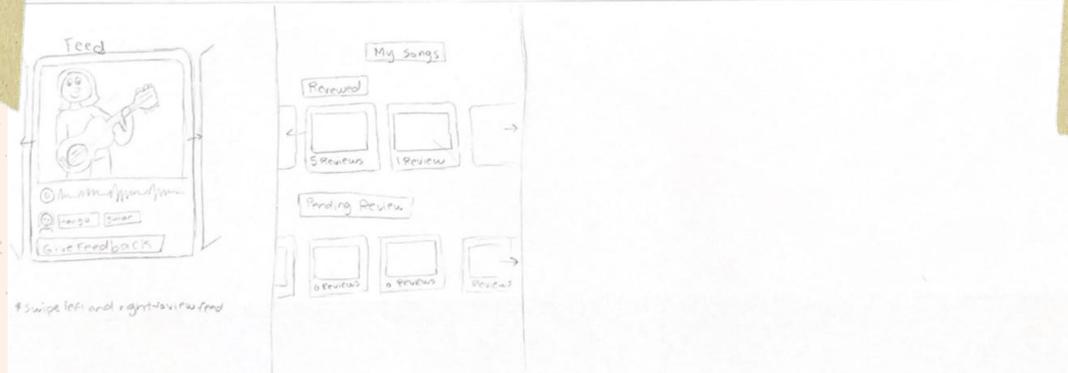


# Realization 2

Native mobile app with explore, following, and profile pages



Realization : A native mobile app with an explore, following, and profile page.



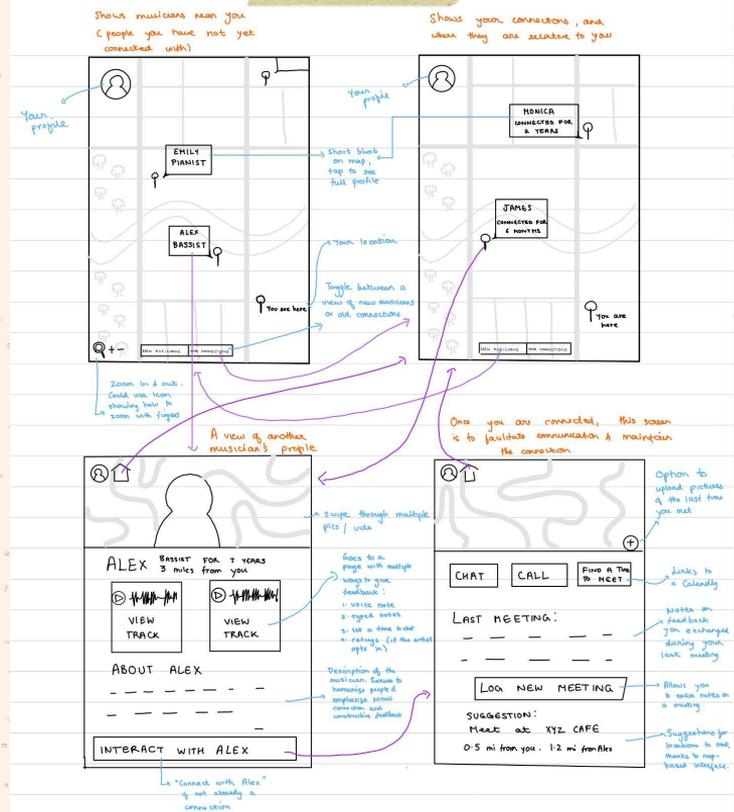
# Realization 3

AR realization where users see and interact with other musicians in their physical space



# Further exploration of realization 1

Native mobile app with a map-based interface



- Annotations B: A native mobile realization, with a map-based interface that allows
- Transitions you to find and connect with musicians in your area for feedback.
- Purpose of screen

# Realization 1: Pros and Cons



Leverage connections outside of app



Promotes local music scenes



In-person feedback or online feedback options



More tangible sense of community



Benefit varies with different users' locations



Privacy and safety concerns



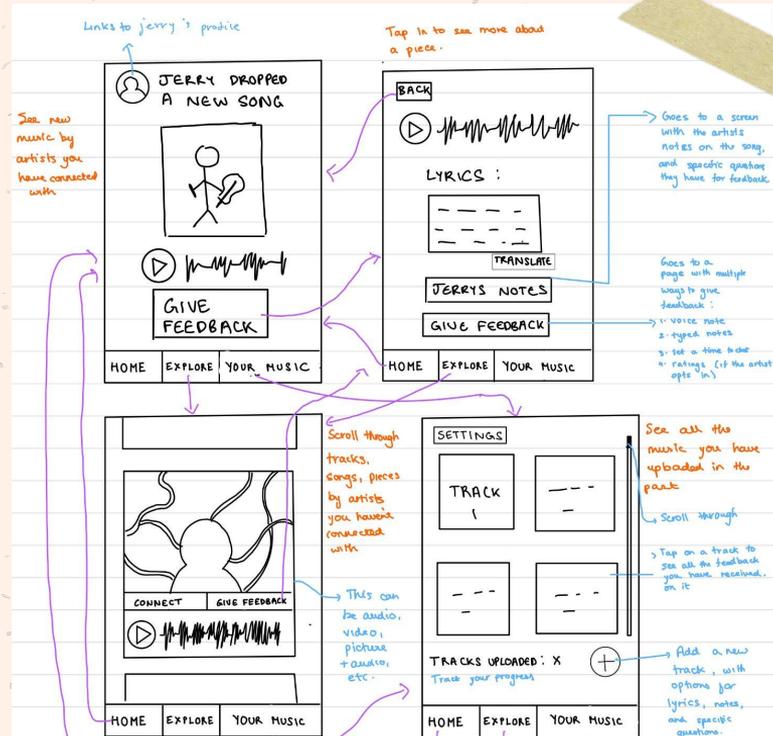
More friction to request feedback



Difficulty connecting w/musicians from other regions

# Further exploration of realization 2

Native mobile app with explore, following, and profile pages



- Annotations
  - Transitions
  - Purpose of screen
- Native mobile app realization with feeds to explore music by new artists, listen to new music posted by your connections, and view feedback on your own music.

# Realization 2: Pros and Cons



Diverse set of musicians to discover



Customizable feedback experience



Low-friction feedback interactions



Feed facilitates making new connections + strengthening existing



Interactions may be superficial



Content moderation necessary: harmful behavior possible



More content -> more overwhelming



Social media, social comparison



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# Our selected interface:

Realization #2: Native mobile app with explore, following, and profile pages

Why:

- Allows for users to be exposed to more new, more diverse musicians via the explore page
- Provides less friction for interaction by providing the option for asynchronous or synchronous feedback
- Provides users with much more options and flexibility in terms of who they can connect with and how many musicians on the interface have relevant experience to their interests (major value added here)

# Our selected interface

Realization #2: Native mobile app with explore, following, and profile pages

Why?

**Exploratory**

New, more diverse types of musicians!

**Low-Friction**

Async/sync option for any commitment level!

**Customizable**

Edit preferences for who can give you feedback!



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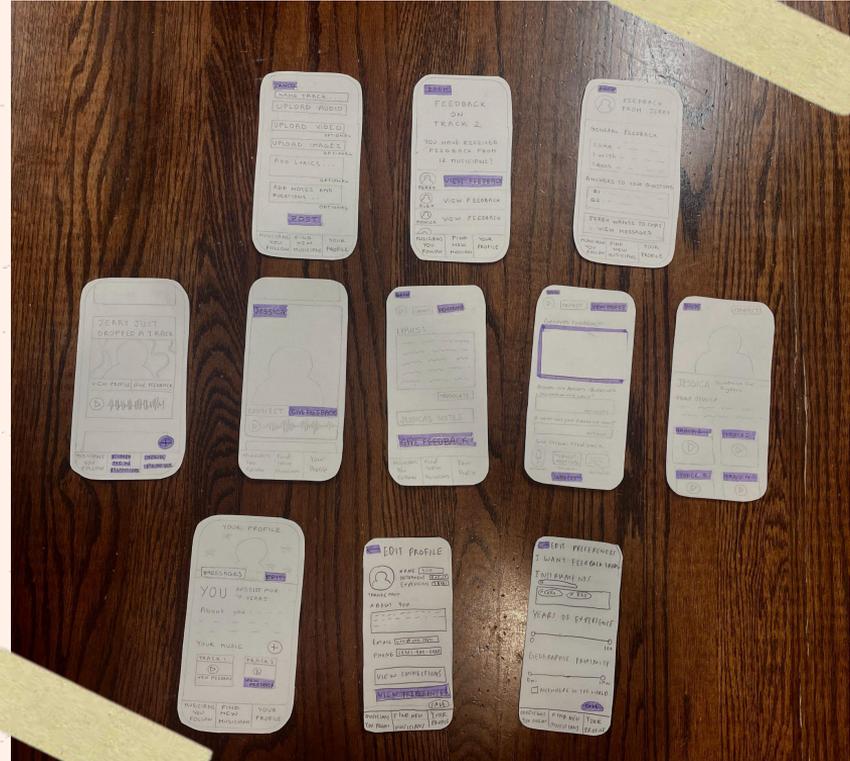
**05** Testing

**06** Discussion



# Low-Fi Prototype

- Poster board, tape, pencil, and highlighters
- Consists of 12 screens and three task flows
- Users interact with the interface by:
  - Tapping on buttons
  - Writing in pencil
  - Moving toggles



# Low-Fi Prototype

## Construction

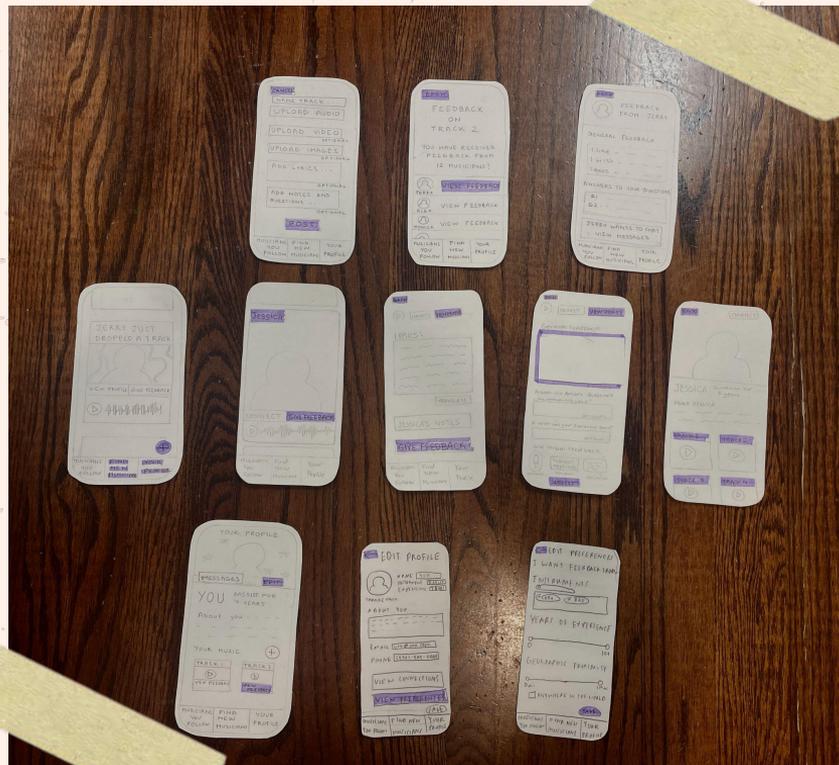
Poster board, tape, pencil,  
and highlighters

## Features

12 screens, 3 task flows

## Interactions

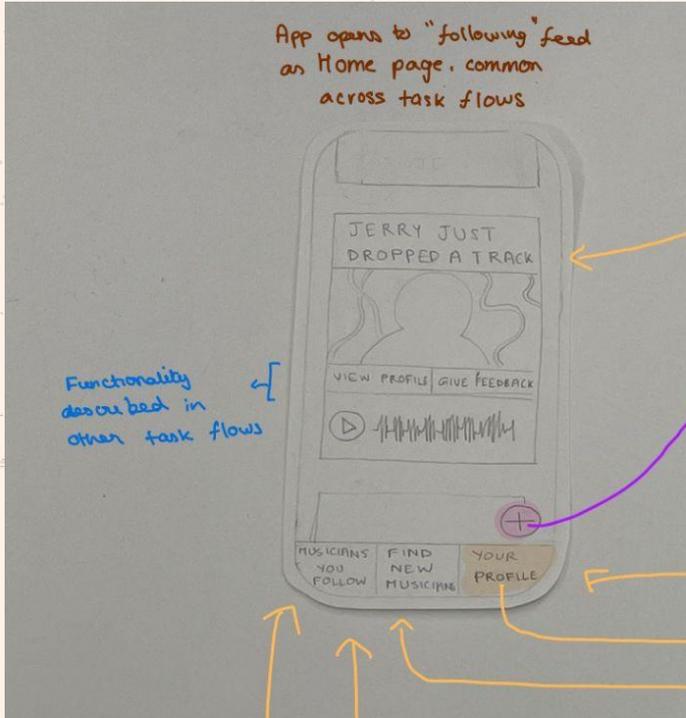
Testers tap buttons, write in  
text boxes, move toggles





# Task 1: Simple

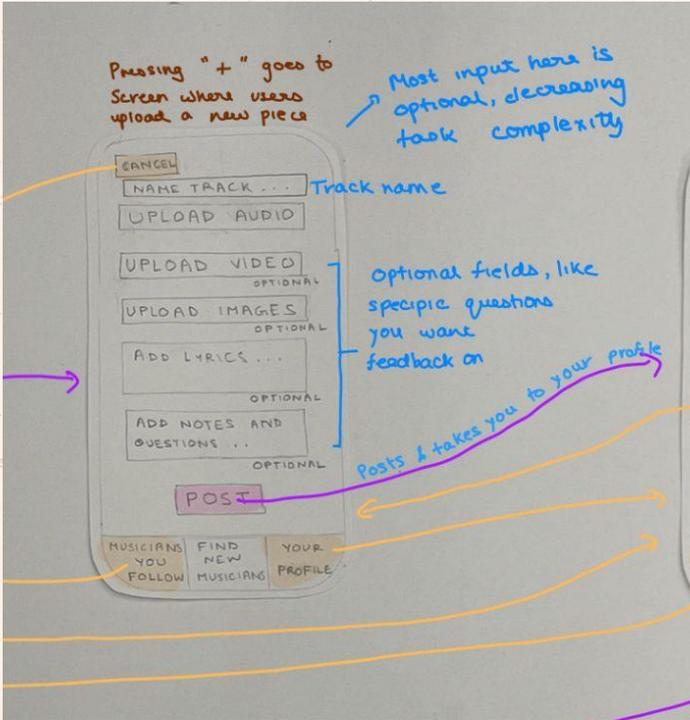
Upload a new track and view feedback from other musicians on it



Step 1: Click "add" button

# Task 1: Simple

Upload a new track and view feedback from other musicians on it

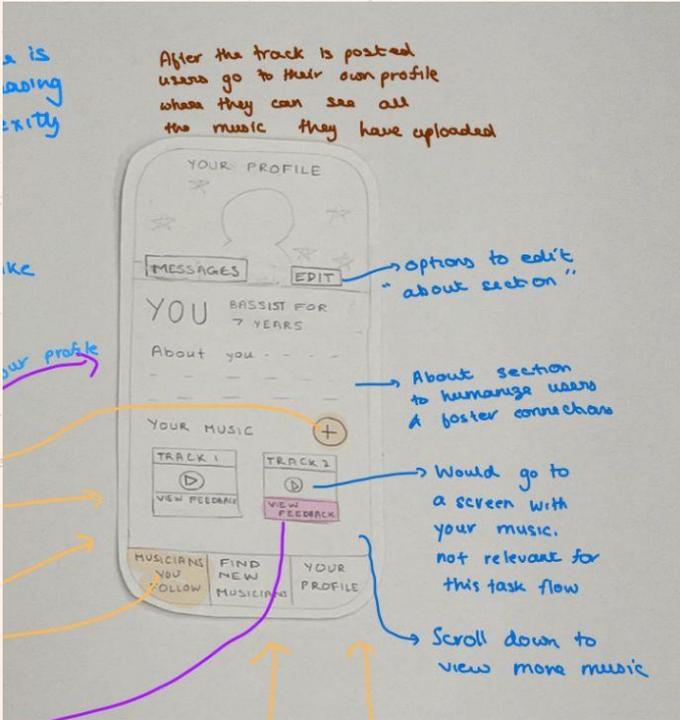


Step 1: Click "add" button

Step 2: Upload track

# Task 1: Simple

Upload a new track and view feedback from other musicians on it



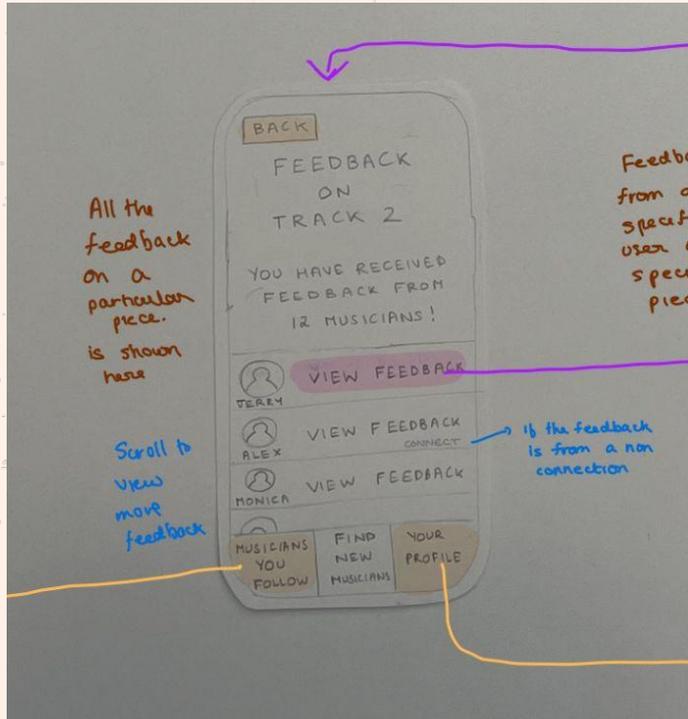
Step 1: Click "add" button

Step 2: Upload track

Step 3: Click on track in profile

# Task 1: Simple

Upload a new track and view feedback from other musicians on it



Step 1: Click “add” button

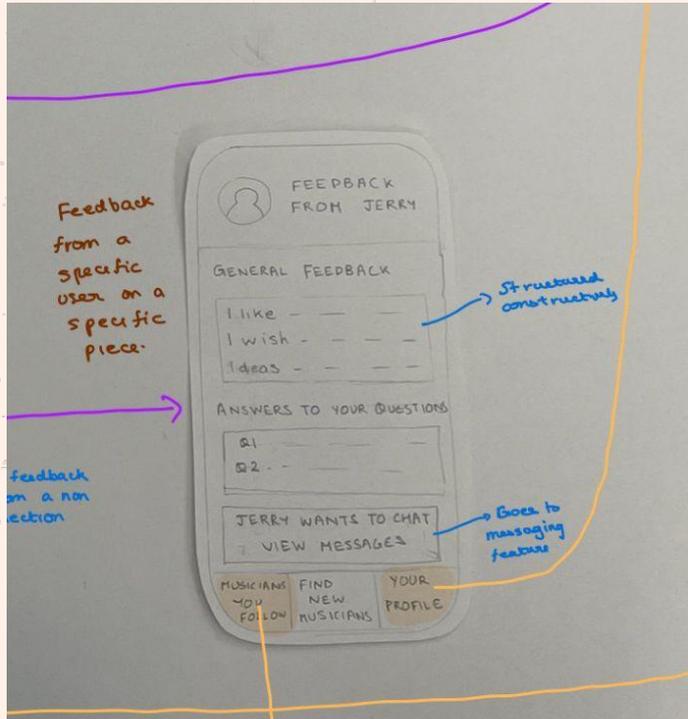
Step 2: Upload track

Step 3: Click on track in profile

Step 4: See all users who have left feedback

# Task 1: Simple

Upload a new track and view feedback from other musicians on it



Step 1: Click "add" button

Step 2: Upload track

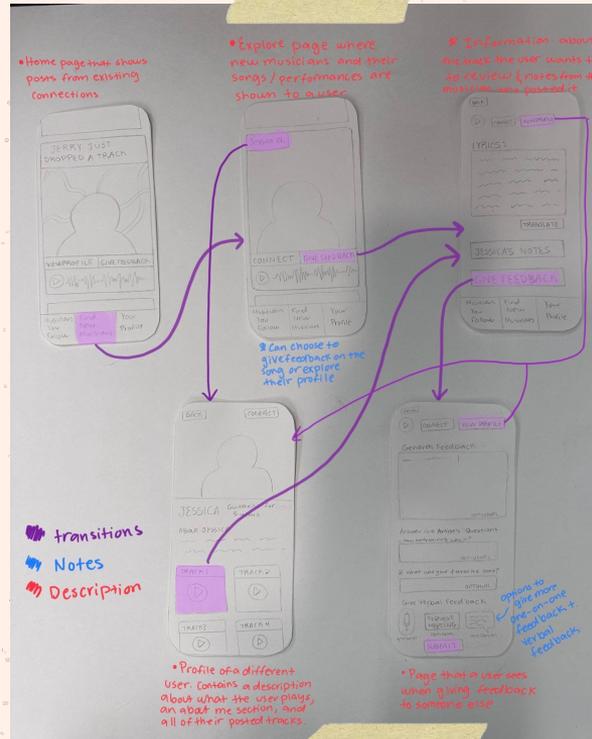
Step 3: Click on track in profile

Step 4: See all users who have left feedback

Step 5: Look at one user's feedback in detail

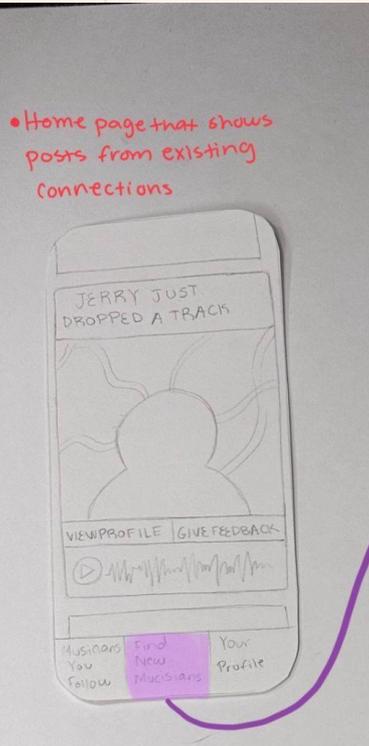
# Task 2: Moderate

Find a new musician on the app and give them feedback



## Task 2: Moderate

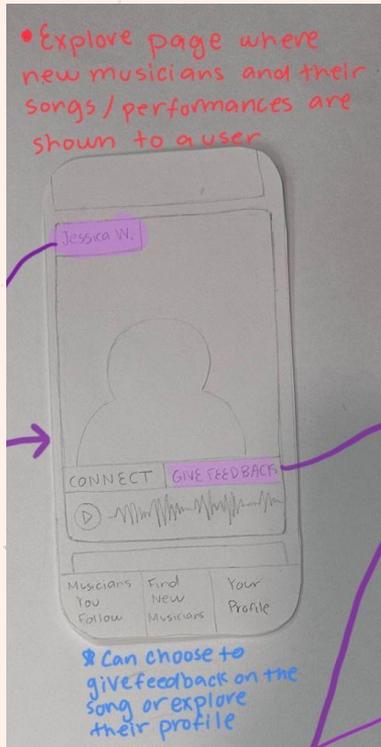
Find a **new musician** on the app and give them **feedback**



**Step 1:** Go to “Find New Musicians” tab

## Task 2: Moderate

Find a **new musician** on the app and give them **feedback**

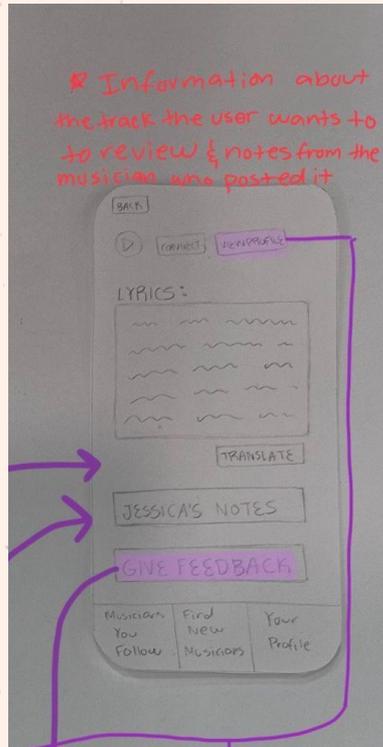


**Step 1:** Go to “Find New Musicians” tab

**Step 2:** Tap user’s song to see more detail

## Task 2: Moderate

Find a new musician on the app and give them feedback



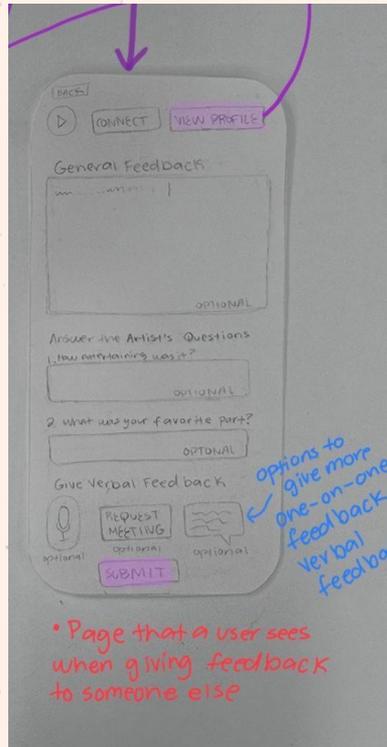
Step 1: Go to “Find New Musicians” tab

Step 2: Tap user’s song to see more detail

Step 3: Tap “Give Feedback”

## Task 2: Moderate

Find a new musician on the app and give them feedback



Step 1: Go to "Find New Musicians" tab

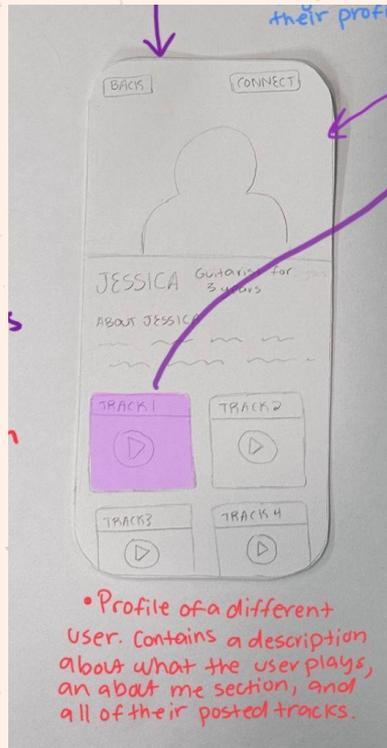
Step 2: Tap user's song to see more detail

Step 3: Tap "Give Feedback"

Step 4: Submit feedback

## Task 2: Moderate

Find a new musician on the app and give them feedback



Step 1: Go to “Find New Musicians” tab

Step 2: Tap user’s song to see more detail

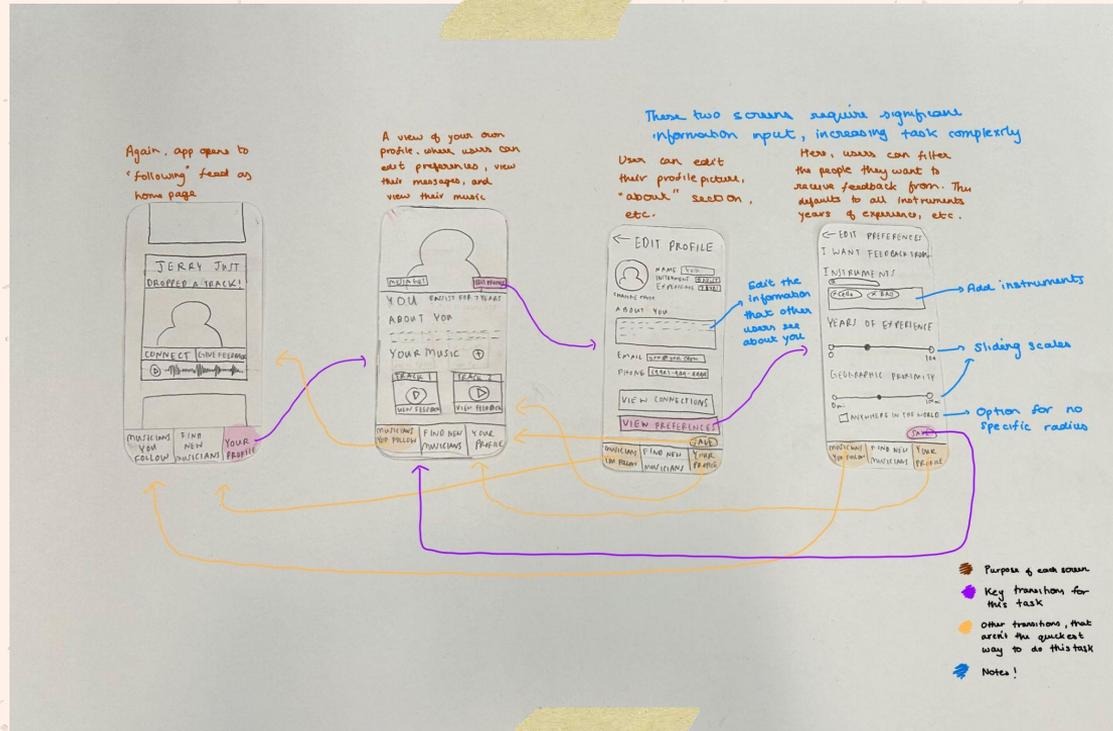
Step 3: Tap “Give Feedback”

Step 4: Submit feedback

Step 5: View user’s profile on submission

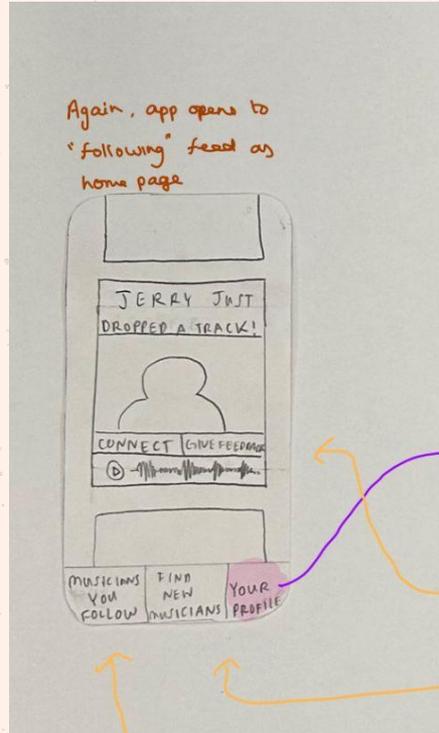
# Task 3: Complex

Change your preferences for which musicians can give you feedback



## Task 3: Complex

Change your preferences for which musicians can give you feedback

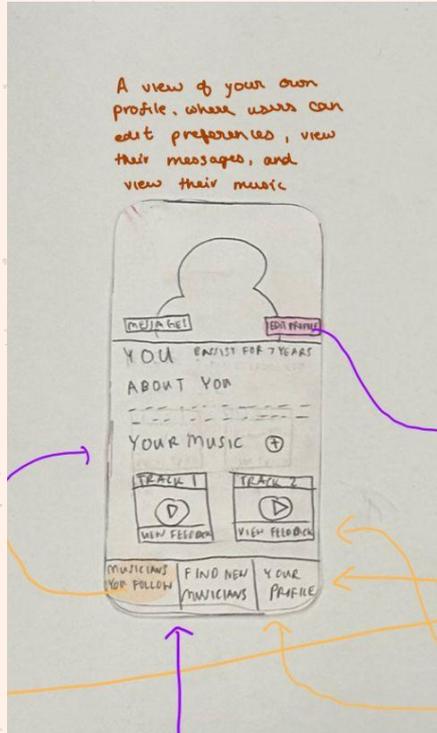


Step 1: Go to your own profile

# Task 3: Complex

Change your preferences for which musicians can give you feedback

A view of your own profile. where users can edit preferences, view their messages, and view their music

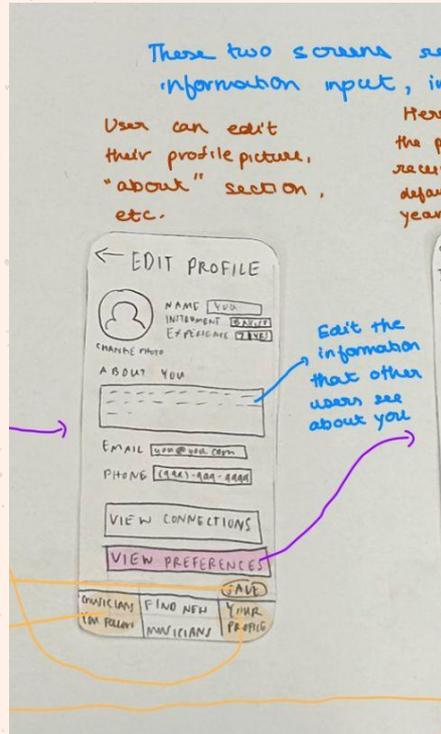


Step 1: Go to your own profile

Step 2: Tap "edit profile"

# Task 3: Complex

Change your preferences for which musicians can give you feedback



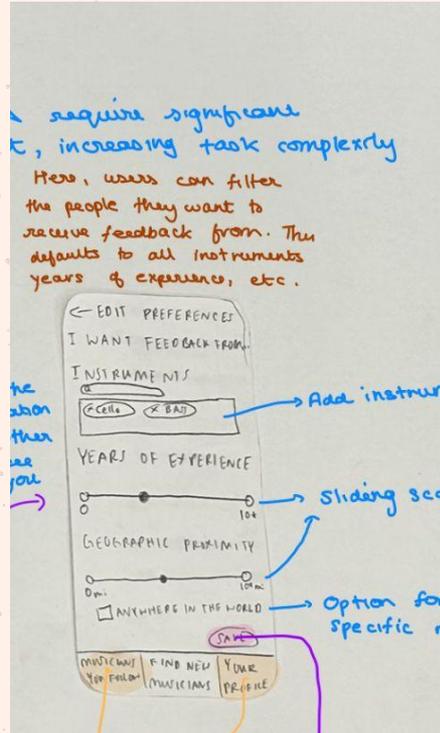
Step 1: Go to your own profile

Step 2: Tap "edit profile"

Step 3: Tap "view preferences"

# Task 3: Complex

Change your preferences for which musicians can give you feedback



Step 1: Go to your own profile

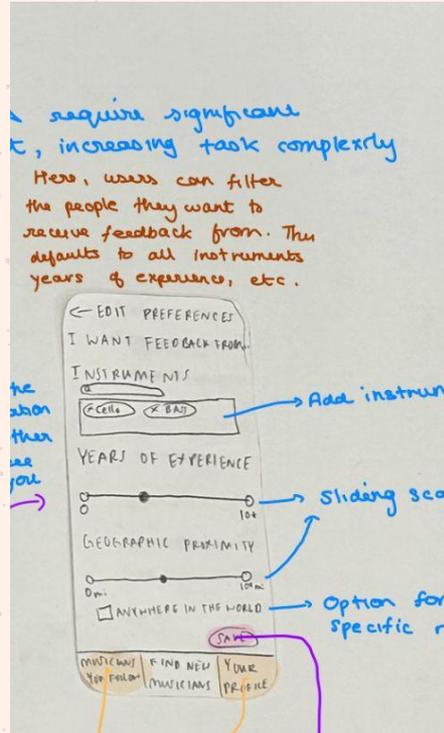
Step 2: Tap “edit profile”

Step 3: Tap “view preferences”

Step 4: Edit preferences

## Task 3: Complex

Change your preferences for which musicians can give you feedback



Step 1: Go to your own profile

Step 2: Tap “edit profile”

Step 3: Tap “view preferences”

Step 4: Edit preferences

Step 5: Save preferences



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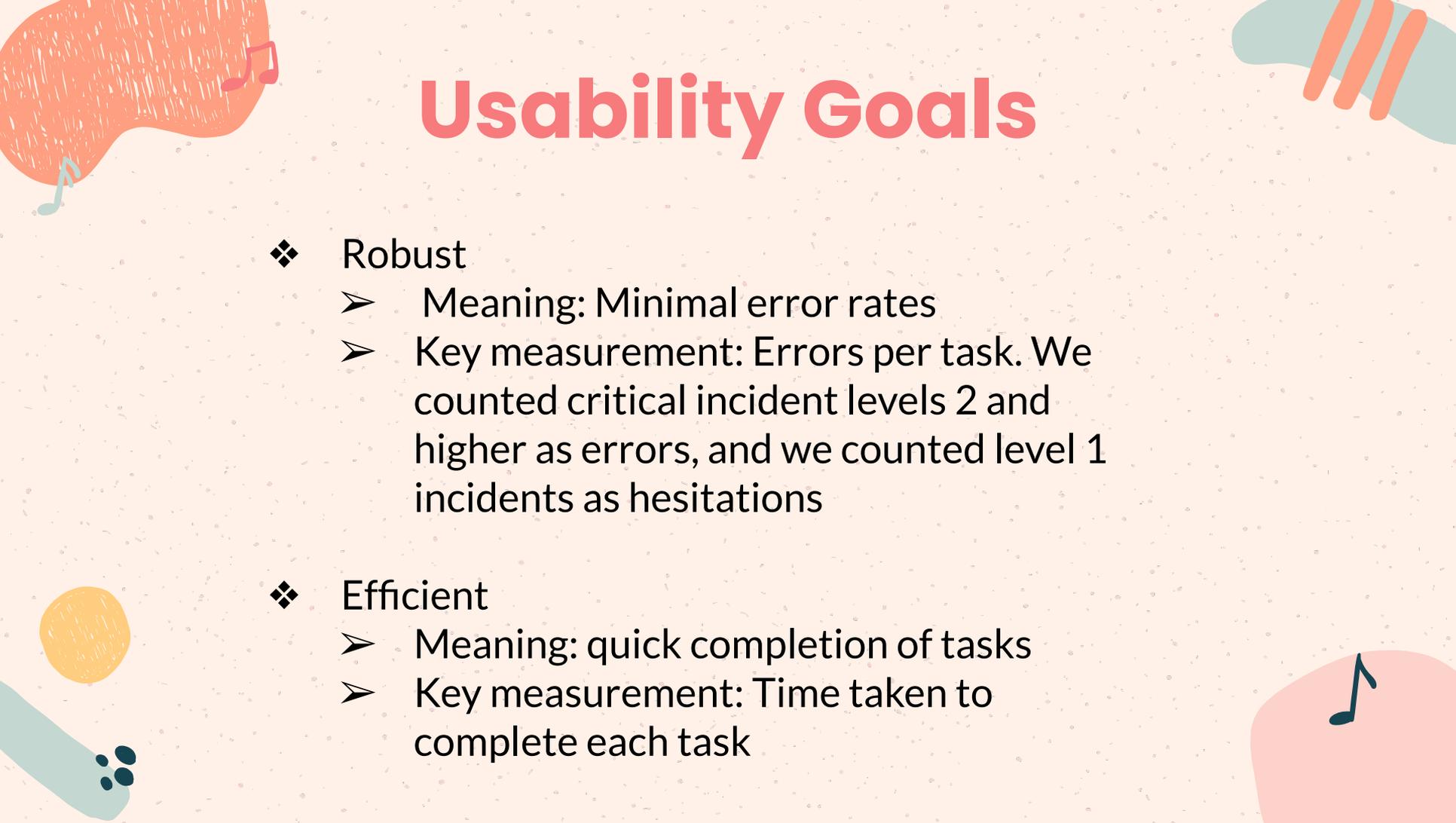
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# Usability Goals

- ❖ Robust
  - Meaning: Minimal error rates
  - Key measurement: Errors per task. We counted critical incident levels 2 and higher as errors, and we counted level 1 incidents as hesitations
- ❖ Efficient
  - Meaning: quick completion of tasks
  - Key measurement: Time taken to complete each task

# Usability Goals

We want keynotes to be...

**Robust**

Minimal error rates

**Key measurement:** errors per task

**Efficient**

Quick task completion

**Key measurement:** time taken per task

I'm an ally!



Elvira Prieto, Ed.M.  
(She, Her, Hers)  
Associate Dean & Director  
El Centro Chicano y Latino



# Tester #1: Elvira

**Who:** Associate Dean and Director  
of El Centro

**Where:** El Centro

Test conducted by Emily, notes taken by Will

Apparatus: paper prototype, pencil





# Results: Test #1

## Bottom Line Data

### **Task 1:**

Errors: 3

Time taken: 3 minutes

### **Task 2:**

Errors: 0

Time taken: 1 minute

### **Task 3:**

Errors: 0 (1 hesitation)

Time taken: 1 minute

## Key Observation

Thought “find new musicians” tab was to request feedback from new musicians, instead of to find music by new musicians

complete list of critical incidents in appendix



## Tester #2: Allan

**Who:** Retired, worked for US DoD

**Where:** Outside Stanford Bookstore

Test conducted by Aditi, notes taken by Will

Apparatus: paper prototype, pencil



# Results: Test #2

## Bottom Line Data

### **Task 1:**

Errors: 0 (1 hesitation)

Time taken: 1 minute 15 seconds

### **Task 2:**

Errors: 2

Time taken: 1 minute

### **Task 3:**

Errors: 3

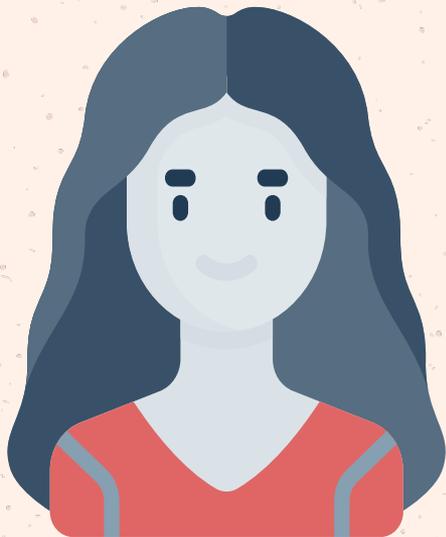
Time taken: 1 minute

## Key Observations

Confused because there were two different “give feedback” buttons

First instinct to change preferences was to look in an individual post (instead of “your profile”)

complete list of critical incidents in appendix



## Tester #3: Hudha

**Who:** Woman in her 30s

**Where:** Outside Stanford Bookstore

Test conducted by Emily, notes taken by Will

Apparatus: paper prototype, pencil



# Results: Test #3

## Bottom Line Data

### **Task 1:**

Errors: 1 (BIG!)

Time taken: 12 minutes

### **Task 2:**

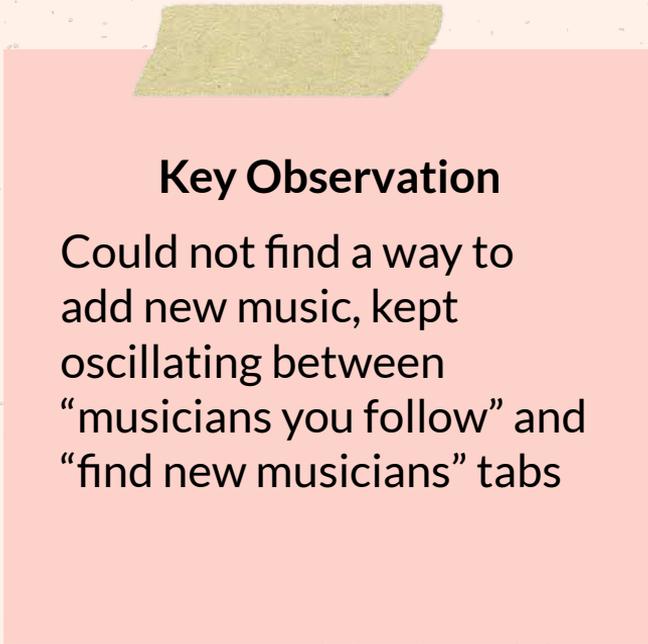
Errors: 0

Time taken: 1 minute

### **Task 3:**

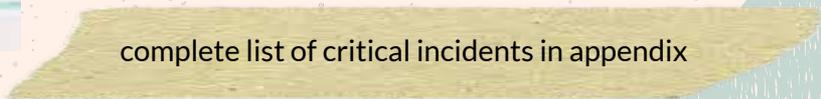
Errors: 1 (BIG!!)

Time taken: Did not finish



## **Key Observation**

Could not find a way to add new music, kept oscillating between “musicians you follow” and “find new musicians” tabs



complete list of critical incidents in appendix



## Tester #4: Astha

**Who:** Employee at World Food Program

**Where:** Outside Stanford Bookstore

Test conducted by Aditi, notes taken by Will

Apparatus: paper prototype, pencil





# Results: Test #4

## Bottom Line Data

### **Task 1:**

Errors: 1

Time taken: 1 minute

### **Task 2:**

Errors: 0

Time taken: 1 minute 10 seconds

### **Task 3:**

Errors: 0 (1 hesitation)

Time taken: 1 minute 20 seconds



## **Key Observations**

Could not find the button to upload a track

Confused by features of giving feedback page



complete list of critical incidents in appendix



## Tester #5: Vikram

**Who:** Raagapella Music Director

**Where:** Outside Stanford Bookstore

Test conducted by Emily, notes taken by Julia

Apparatus: paper prototype, pencil



# Results: Test #5

## Bottom Line Data

### **Task 1:**

Errors: 0 (1 hesitation)

Time taken: 50 seconds

### **Task 2:**

Errors: 0

Time taken: 1 minute

### **Task 3:**

Errors: 0 (1 hesitation)

Time taken: 45 seconds

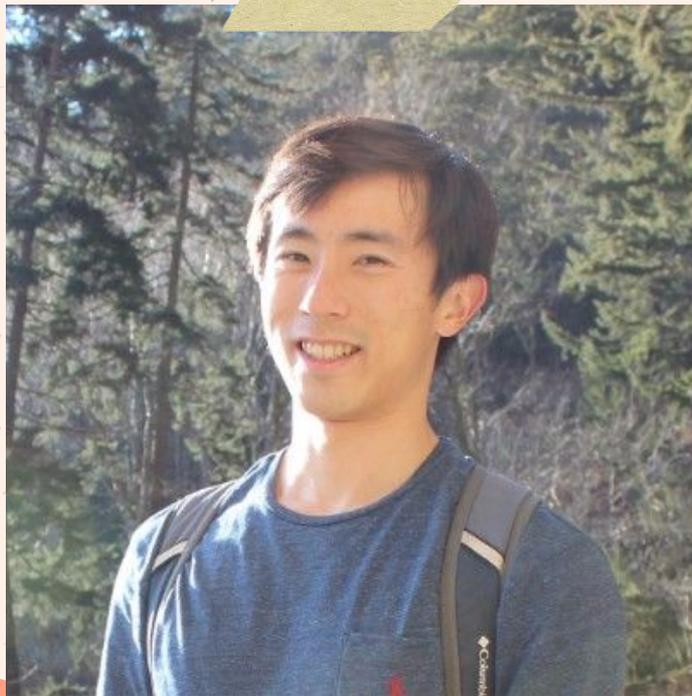
## **Key Observations**

Said “this feels intuitive like Instagram”

Got through the tasks very efficiently

complete list of critical incidents in appendix

# Tester #6: Taide



**Who:** Engineer at Tesla

**Where:** EVGR-A

Test conducted by Julia, notes taken by Will  
Apparatus: paper prototype, pencil

# Results: Test #6

## Bottom Line Data

### **Task 1:**

Errors: 1 (1 hesitation)

Time taken: 1 minute

### **Task 2:**

Errors: 1 (1 hesitation)

Time taken: 1 minute

### **Task 3:**

Errors: 0

Time taken: 50 seconds

## **Key Observation**

Said some of the navigation unintuitive: duplicate “give feedback” presses; button to add track unclear

complete list of critical incidents in appendix

# Usability Metrics Synthesis

## Robust

Total errors per task:

Task 1: 6

Task 2: 3

Task 3: 4

## Efficient

Avg time per task:

Task 1: 191 sec\*

Task 2: 62 sec

Task 3: 59 sec

\*excluding the outlier, task 1's avg is 85 sec

### How'd we do?

- Errors were highest in task 1; this may indicate a learning curve for using paper prototypes
- The amount of time it took to recover after an error decreased with each task (indicates learnability!)



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# Big Picture Issues

Overall, what did our testers struggle with in our prototype?



## Unclear functions

Users interpreted elements as having different functions than we intended



## Complexity

Users got lost during the multiple steps it took to navigate through the app to complete a task

# Big Picture ~~Issues~~ Opportunities!

What are the overall implications of these findings? **We can...**



**Clarify** the function  
of elements



**Simplify** the steps  
of each task



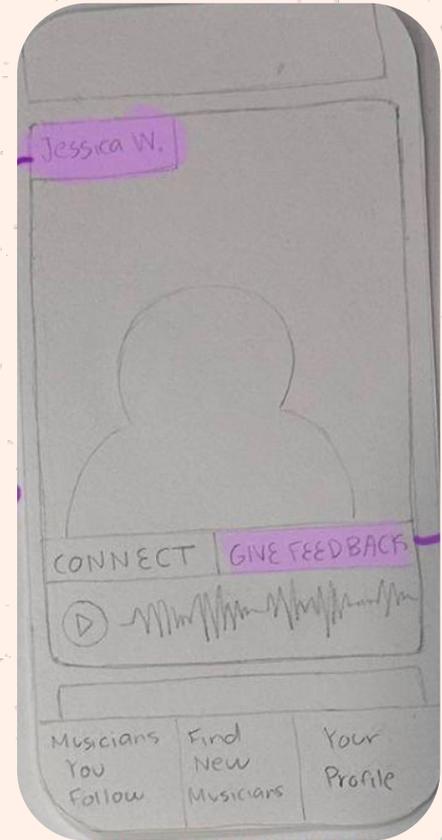
# Clarify: Design Change #1

## Problem

Tester thought that the connect button would help them give feedback to a new musician

## Solution

Remove “connect” button and instead replace with something that makes it clearer that the function is just to add a musician as a friend → “add friend” button





## Clarify: Design Change #2

### Problem

Testers thought that the “find new musicians” tab allowed them to see feedback from new people

### Solution

Revise “find new musicians” button to make it clearer that you use it to find new musicians **to give feedback to** rather than to view feedback from → change to “find new music”





# Simplify: Design Change #3

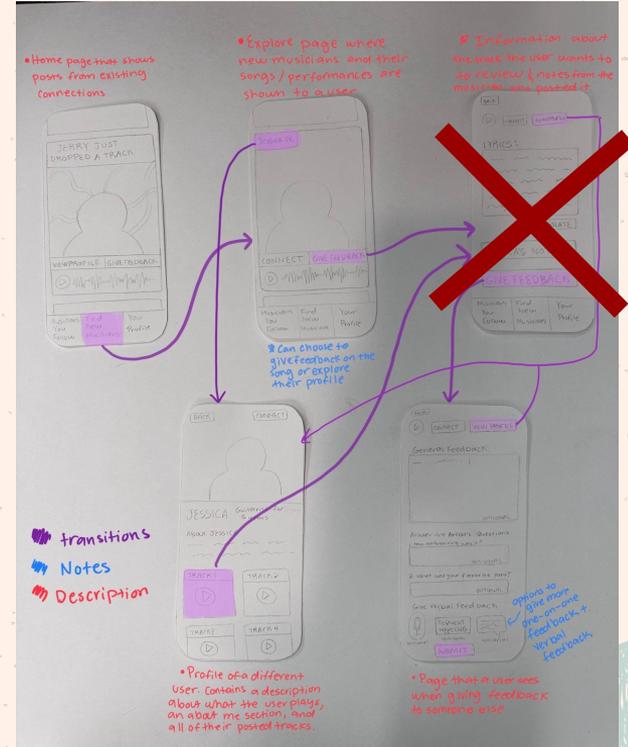


## Problem

Users were confused about having to click on a “give feedback” button on multiple screens before they could actually give feedback to a new musician

## Solution

Display notes and allow users to enter feedback on one single screen to avoid an extra unnecessary step for the user





# Simplify: Design Change #4

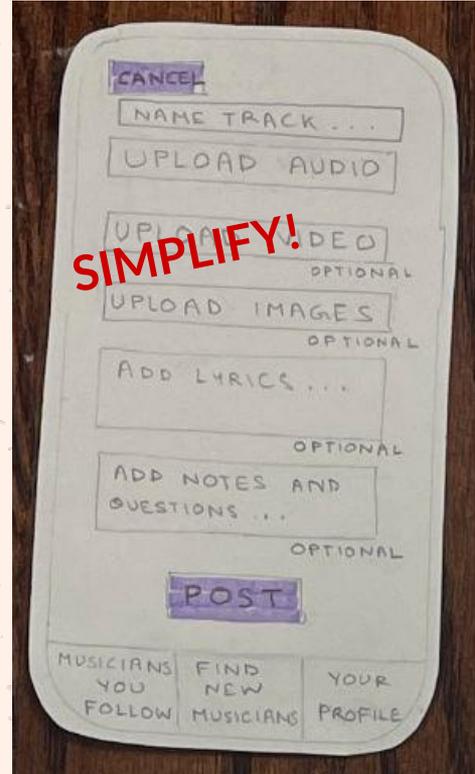


## Problem

The upload new music page was more complicated than it needed to be

## Solution

Have a simplified page to add audio/video, and a pop up or separate page for more complicated additions like lyrics, notes, and questions





# Shortcomings of Usability Test

- Feedback focused on ease of tester's navigability, not so much on feature desirability
- Tester confusion about concept of paper prototype
- Platform learning curve vs. better UI for later tasks
- Timing affected by our efficiency as “computers”





# Thank you!

Questions? Comments?





# APPENDIX

# Realization 1: Map Based

## Pros

- Allows musicians to make connections around them that they can leverage outside of the app
- Promotes local music scenes via connections and potentially collaborations
- Allows users to find in-person connections
- Gives the option for either in-person feedback sessions or online
- Also gives option for both synchronous and asynchronous feedback
- Facilitates in-person feedback sessions through suggested time/place
- Gives a more tangible sense of community by allowing people to see community on the app that is also physically around them
- Shows experience levels of musicians
- Shows degree of connection and previous interaction with musicians near the user
- Can toggle between connected and new users easily

## Cons

- May be unfair or skewed based on how many musicians live in the user's area
- May also be skewed in terms of the distribution of musical experiences, i.e. there may not be many other harp players in the area
- Presents safety issue with meeting strangers for the first time
- Similarly, presents privacy concerns with regard to location data (if too specific)
- There is more friction between meeting someone in person than just asking for feedback entirely remotely
- Diversity of ideas might be constrained if a user is encouraged to interact with people physically around them (echo chamber)
- Harder to obtain quick, crowdsourced feedback from a large base of people
- More difficult to connect with musicians from other regions
- Harder to discover, interact with, or exchange musical ideas from other around them
- Users online may be hostile to one another or give negative/unhelpful feedback

# Realization 2: Feeds

## Pros

- Allows musicians to be exposed to and connect with a diverse set of musicians
- Allows users to easily request feedback and keep track of their own
- Subsequently, allows them to obtain feedback in a more timely manner
- Allows users to set guidelines on the format and type of feedback they want to receive
- Low-friction interactions (just need to scroll and press a button for feedback)
- Allows users to easily build rapport with other users by learning about them through videos and their profile before they give feedback (important based on our experience prototype)
- Gives users the option to give entirely async feedback or pursue more face-to-face interaction (option to schedule a call)
- Can discover new genres, styles, and musical ideas from others through scrolling
- Less concern with regards to privacy and safety
- Easier to navigate feed page vs a map

## Cons

- While it gives the option for a chat, the interface is designed to accommodate written feedback more than to encourage in-person + face-to-face interaction which some users might find valuable
- Can lead to lots of spectators on the app who don't give feedback but just scroll and post their own songs
- Can lead to superficial interactions between people
- Explore page might lead to echo chamber that might limit creativity based on how it's designed
- Requires users to put energy into looking for someone to give feedback to (scroll on their explore and home page until they feel compelled to give feedback) rather than finding people for them
- Potential for toxic/negative user interactions as well, but less so given structured feedback requests
- Content moderation: need to ensure that clips posted follow certain community guidelines and do not present harmful or triggering content to other users
- Less geospatial emphasis
- Content can be overwhelming; feed can create fatigue
- If not careful, social media-like design can lead to negative mental health symptoms through comparison and judgment

# Interview Script

[Post recruitment and consent]

This is an app for musicians to get feedback on their music and give feedback to other musicians. Please pretend that you are a musician, and we will give you three tasks to complete on the app. Please let us know when you believe that you have completed a task.

Anything that is highlighted in purple is an icon that you can press, and it will take you to a new screen or enact a change on the app, just like icons or widgets on an actual phone screen.

Here are your tasks: [participant indicates that they have completed the task before the next task is presented; task is written on a paper and available for them to view as they attempt to complete it]

1. Upload a new track and view feedback from other musicians on it
2. Find a new musician on the app and give them feedback on their music
3. Change your preference for which musicians can give you feedback

# Critical Incidents Log

[https://docs.google.com/document/d/16PavPG33gexXE8jlpFpsD4\\_fHciXU68kLYw8z6IfEPI/edit](https://docs.google.com/document/d/16PavPG33gexXE8jlpFpsD4_fHciXU68kLYw8z6IfEPI/edit)