



Improving Spotify's Playlist Feature: Human Factors Analysis

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Today's Agenda

Task Analysis and Prototyping:
Key Findings

Usability Testing:
Users & Methods

Usability Testing:
Problems Identified & Evaluation



Timeline

**Task
Analysis**

Prototyping

**Usability
Testing**

Month 1

Month 2

Month 3



Task Analysis: Functions

The **main functions** include:

- 1 **Search** for a song and add the song to a newly-created playlist.
- 2 **Browse** Spotify's music selection by *Genre: Rock* and *Playlists: Weekly Top Picks*, then add the song to a playlist.
- 3 **Discover** music from Facebook friends through Spotify and add preferred songs into the personal music library, known as "Your Music".



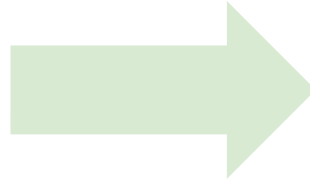
Design Process

Task Analysis

Define Functions



Sources of Error



Prototyping

Specific Errors



Design Solutions



A close-up, slightly blurred image of a person's hands playing a guitar. The guitar has a light-colored body and a dark fretboard. The background is dark and out of focus.

Task Analysis: Methods

Retrospective
Think-Aloud
Verbal Protocol



Task Analysis: Methods

Retrospective
Think-Aloud
Verbal Protocol



Questionnaire



Task Analysis: Methods

Retrospective
Think-Aloud
Verbal Protocol



Questionnaire



**Concurrent
Observations**



Task Analysis: Methods

Retrospective
Think-Aloud
Verbal Protocol



Questionnaire



Concurrent
Observations



Functional Tasks and Subtasks



“Sources of Error”



Design Process

Task Analysis

Define Functions



Sources of Error



Prototyping

Specific Errors



Design Solutions



Task Analysis: Functions

We chose...

- 1 **Search** for a song and add the song to a newly-created playlist.
- ✓ **Browse Spotify's music selection by *Genre: Rock* and *Playlists: Weekly Top Picks*, then add the song to a playlist.**
- 3 **Discover** music from Facebook friends through Spotify and add preferred songs into the personal music library, known as "Your Music".



Task Analysis: Functions

We chose...

Motivation:
Weakest Performance



- 1 Search for a song and add the song to a newly-created playlist.
- ✓ Browse Spotify's music selection by **Genre: Rock** and **Playlists: Weekly Top Picks**, then add the song to a playlist.
- 3 Discover music from Facebook friends through Spotify and add preferred songs into the personal music library, known as "Your Music".



Prototyping



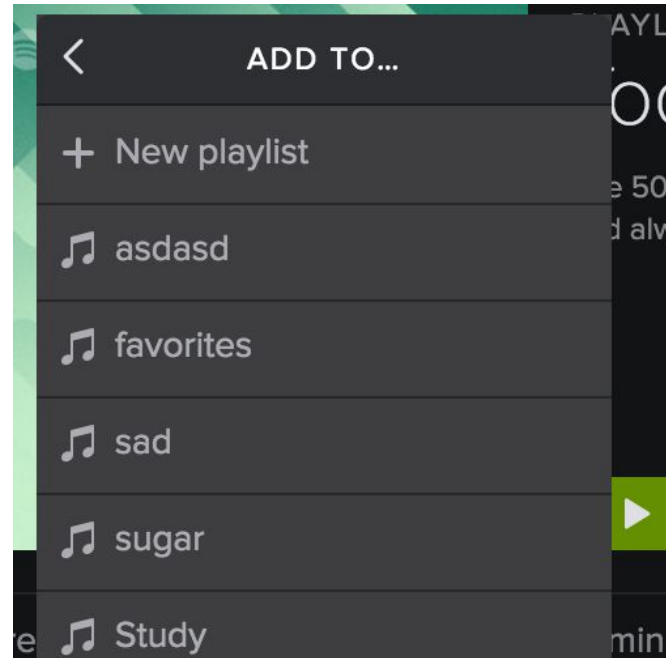
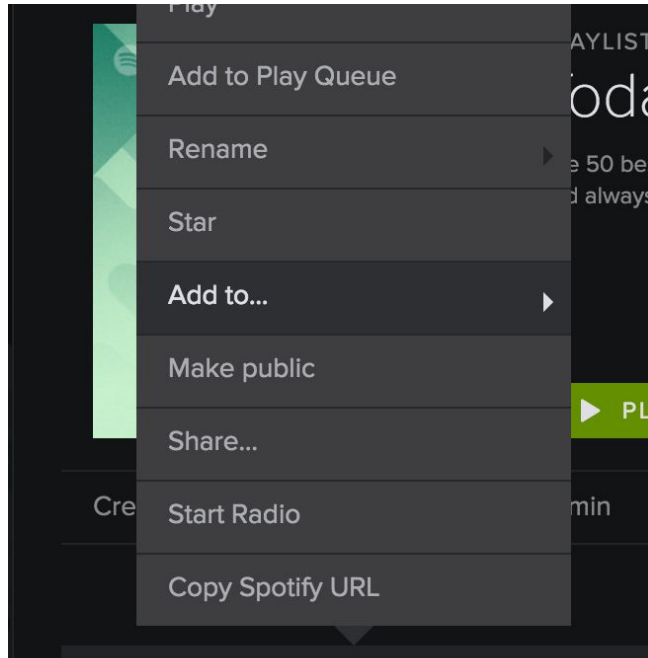
3 System Shortcomings

- 1 Lack of a centralized and personalized homepage
- 2 Difficult navigation through music options
- 3 Lack of a streamlined process to add songs into a playlist



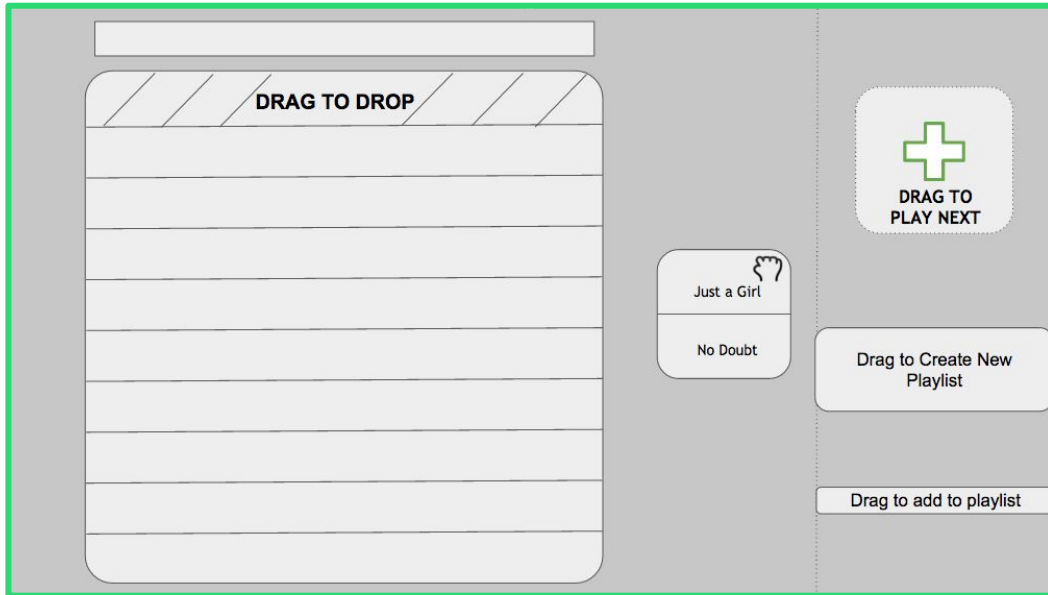
Prototyping

Lack of Streamlined Process



Prototyping: Solution

Design Solution: Drag and Drop



Heuristic/Principles Implementations:

Efficiency: Reduce number of steps with drag and drop

Feedback: Spotlighting of actions

Decision complexity advantage:
Only 3 options



Usability Testing Process

After prototyping, what did our team do next?



Evaluated how users perform tasks on our developed prototype



Usability Testing Process

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Analyzed data to identify core problems of prototype before further progress



Usability Testing Process

After prototyping, what did our team do next?



Evaluated how users perform tasks on our developed prototype



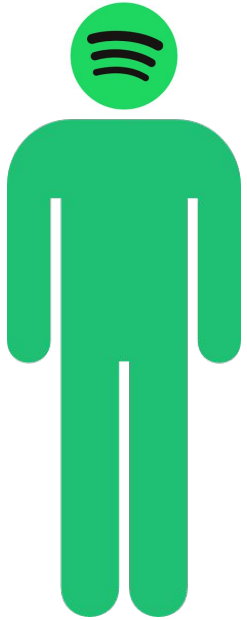
Analyzed data to identify core problems of prototype before further progress



Developed recommendations



User Profile



- Males and females between ages of 18-22, subset of 26% of Spotify users 18-24 → *majority*
- Current full-time 2015-2016 University of Toronto undergraduate students
- Experienced English-speaking users who own a free Spotify Web account and have created a playlist before

Participant Tasks



Find a song that belongs to Genre: Rock



Add song to a playlist



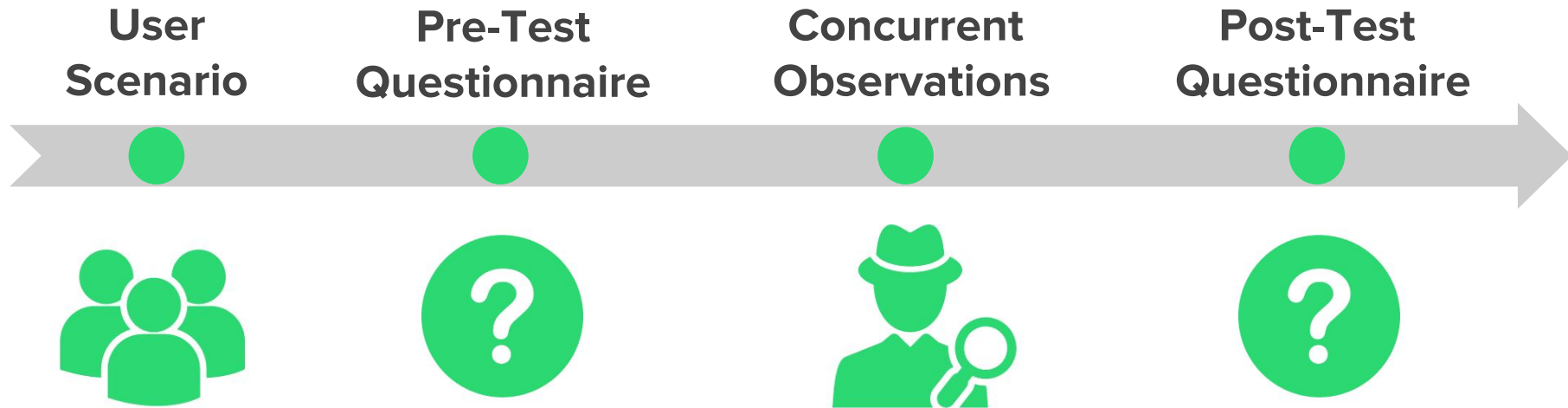
Create a playlist



Cancel song addition



Methods Used



User Scenario

User Scenario



Users were told to **create** a playlist and populate it with two songs from Genre: Rock

User Scenario

User Scenario



Users were told to **create** a playlist and populate it with two songs from Genre: Rock



This would test specific functions in the vertical prototype with their finger acting as a **mouse cursor**

Pre-Test Questionnaire

Pre-Test Questionnaire



Users were screened
according to the user profile
defined by **Team Member A**

Pre-Test Questionnaire

Pre-Test Questionnaire



Users were screened according to the user profile defined by **Team Member A**



Asked questions such as Spotify experience, demographic, etc

Concurrent Observations - Quantitative

Concurrent Observations - Quantitative



Team Member B

administered the test and
performed paper frame
transitions

Team Member C

recorded quantitative
data, such as time and
number of clicks

Metrics



Number of General Clicks: Task Efficiency

Number of Redo Clicks: Task Success

Number of Drag and Drops: Task Success

Number of Help Requests: Discoverability

Time Taken to Perform Tasks: Learnability

Concurrent Observations - Qualitative

Concurrent Observations - Qualitative



Team Member A proceeded
to record the user
observations during tasks

Concurrent Observations - Qualitative

Concurrent Observations - Qualitative



Team Member A proceeded
to record the user
observations during tasks



Verbal think-aloud protocol
and physical actions
provided real-time feedback

Post-Test Questionnaire

Post-Test Questionnaire



Team Member A

administered post-test and
recorded answers

Post-Test Questionnaire

Post-Test Questionnaire



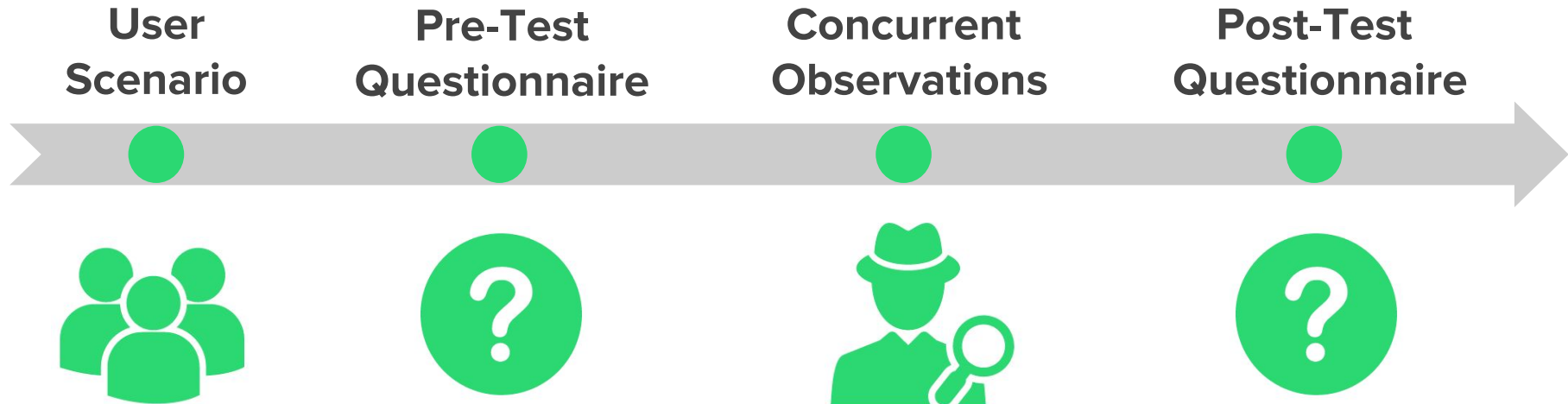
Team Member A
administered post-test and
recorded answers



Collected user satisfaction
data through a Likert
ranking scale from 1-5 and
qualitative opinions

Testing Methods

The retrospective data complements the concurrent data collected by the team, allowing a holistic summary of the system.

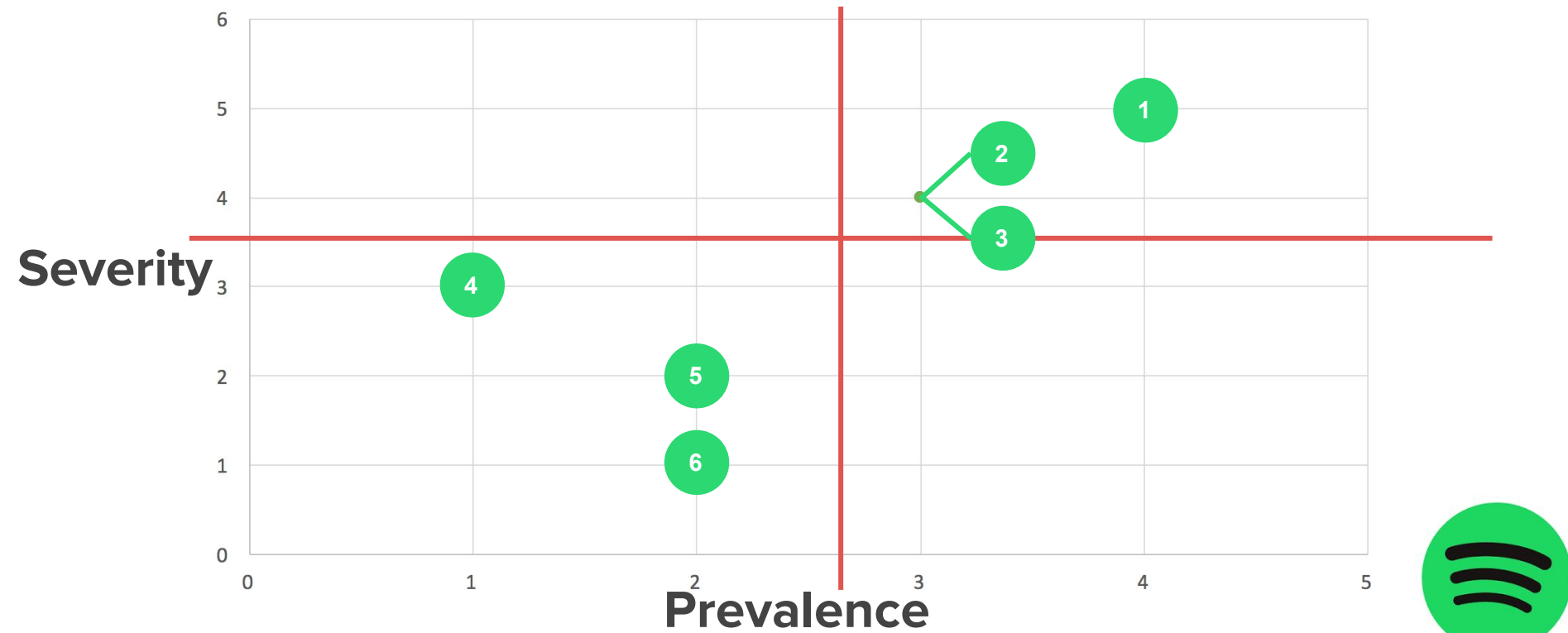


Usability Problems

- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | User is unaware of the drag function | ✖ | ✖ | ✖ | ✖ | ✖ |
| 2 | User attempt to drag songs to other songs | ✖ | ✖ | ✖ | ✖ | ✖ |
| 3 | User unaware how to create a new playlist | ✖ | ✖ | ✖ | ✖ | ✖ |
| 4 | Unintuitive and inconsistent drag locations | ✖ | ✖ | ✖ | ✖ | ✖ |
| 5 | Drop down menu/hint was not immediately noticed | ✖ | ✖ | ✖ | ✖ | ✖ |
| 6 | Confusion over how to deselect drop-down menu | ✖ | ✖ | ✖ | ✖ | ✖ |



Usability Problems



Urgent Usability Problem



Drag and Drop

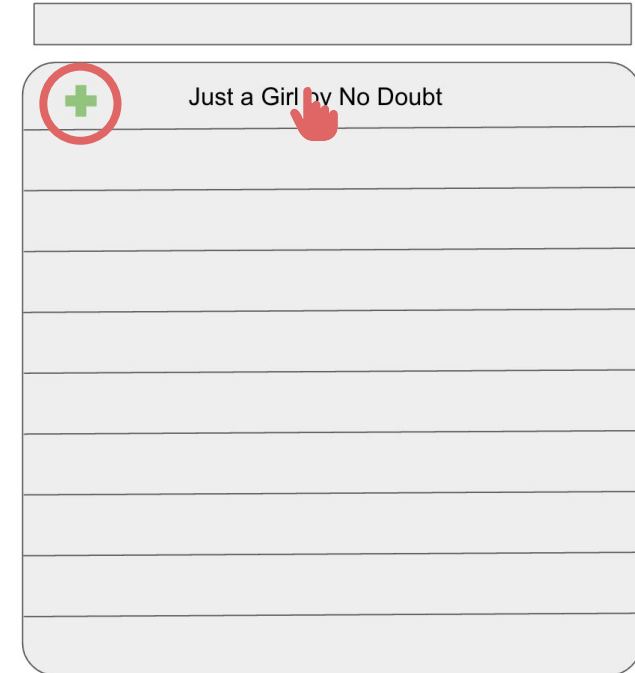
- User was unaware of the drag function
- Lack of flexibility



Urgent Usability Solution

Multiple Options To Drag

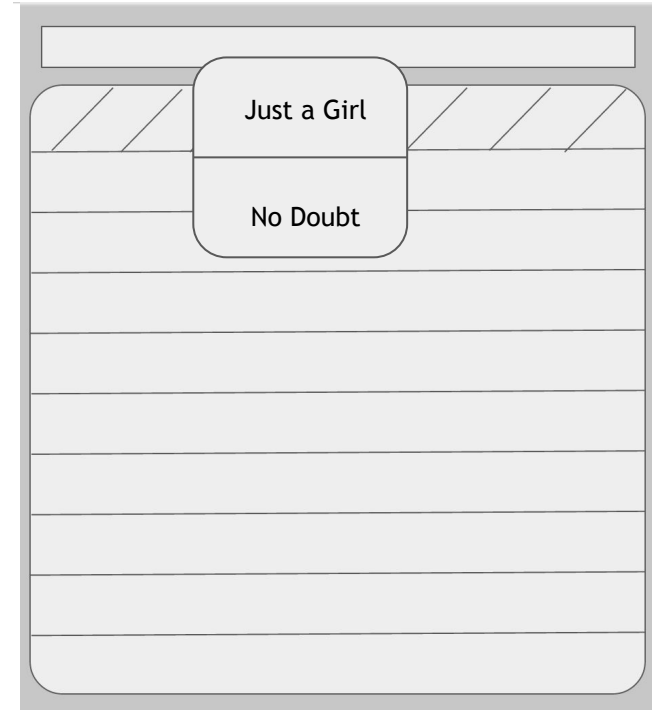
- Hover
- Clicking '+'
- Right-click



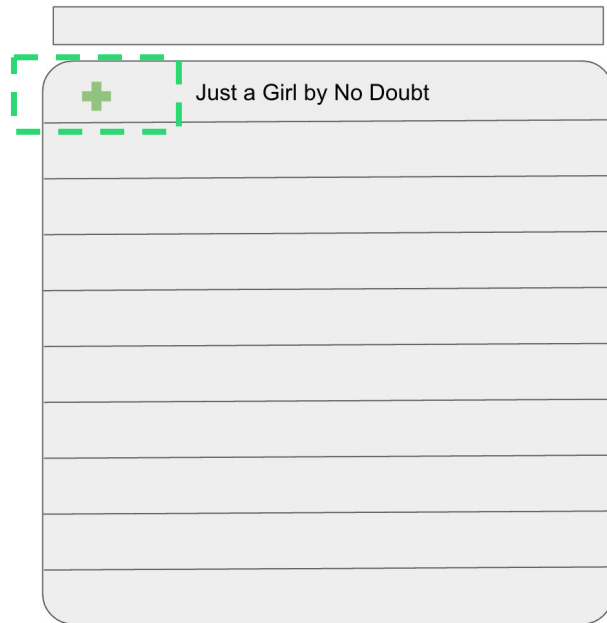
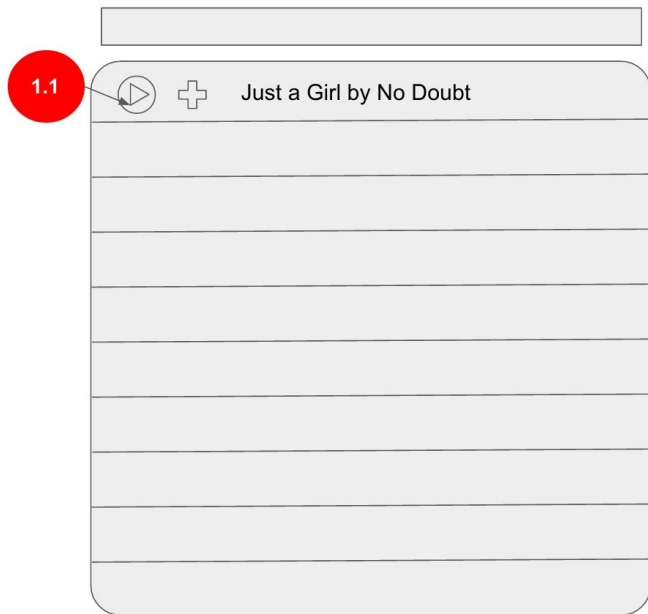
Urgent Usability Solution

Heuristic Achieved

- **Flexibility, ease of use and discoverability**



Drag And Drop



Urgent Usability Problems



Drag and Drop Location

- User attempted to drag songs to other songs
- Lack of match between system and the real world
- Lack of consistency



Urgent Usability Solution

“Click to Drag”

- Change the prompt to “Click To Drag”



Urgent Usability Solution

Heuristic Achieved

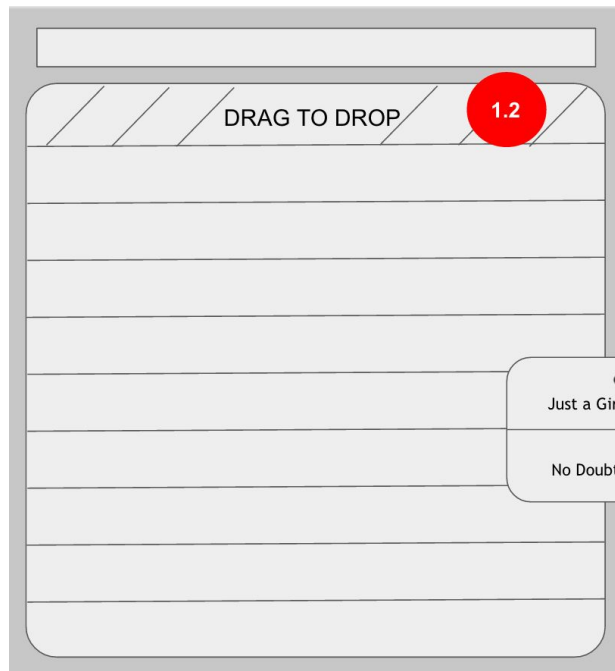
- Consistency with everyday language



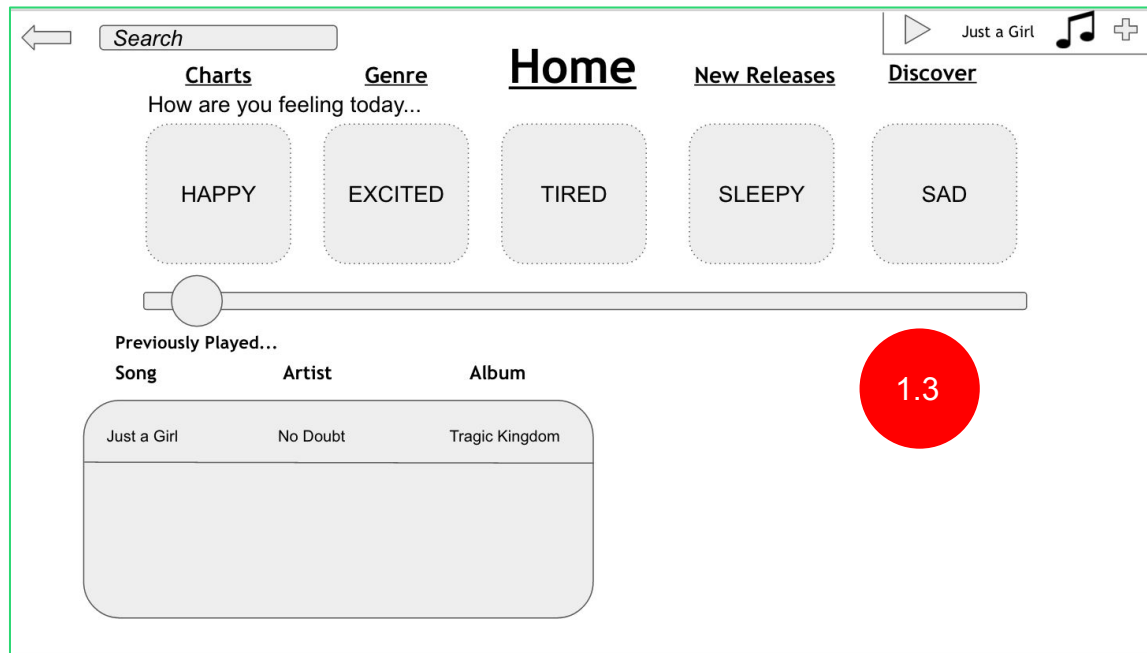
CLICK TO DRAG



Drag And Drop Location



Urgent Usability Problems

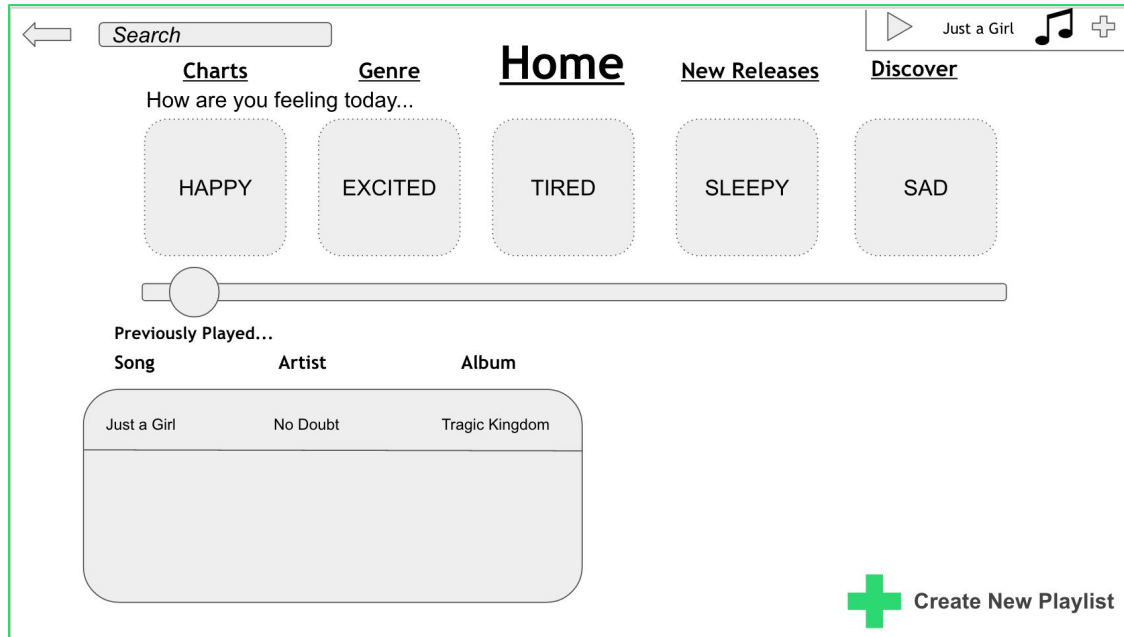


Create New Playlist

- User unaware of how to create a new playlist



Urgent Usability Solution

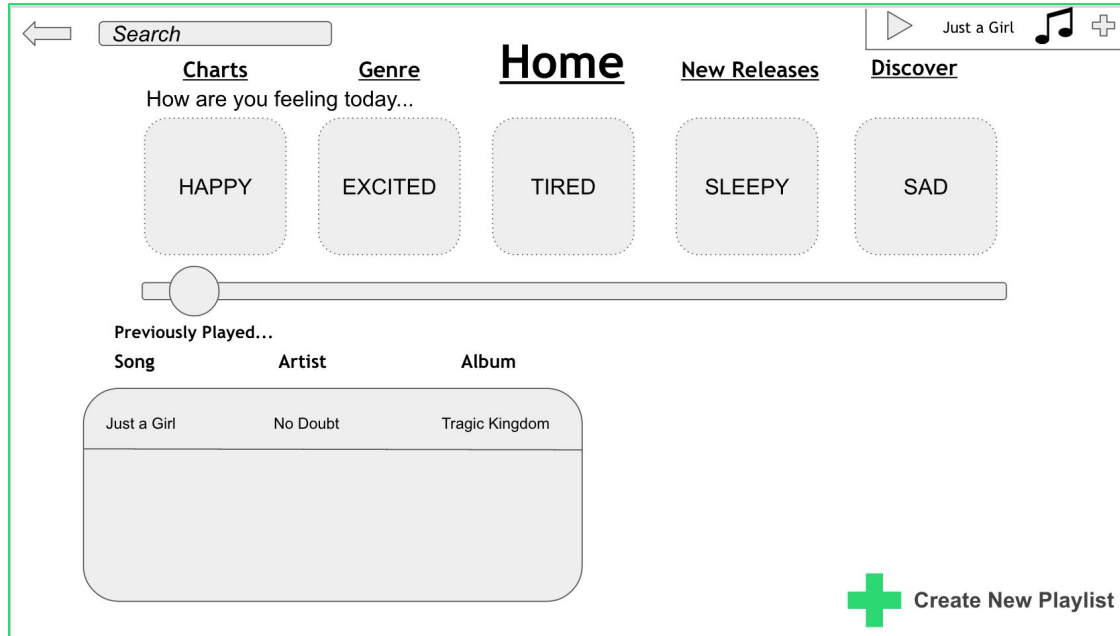


Add Button

- Add a “Create Playlist” button on the homepage



Urgent Usability Solution

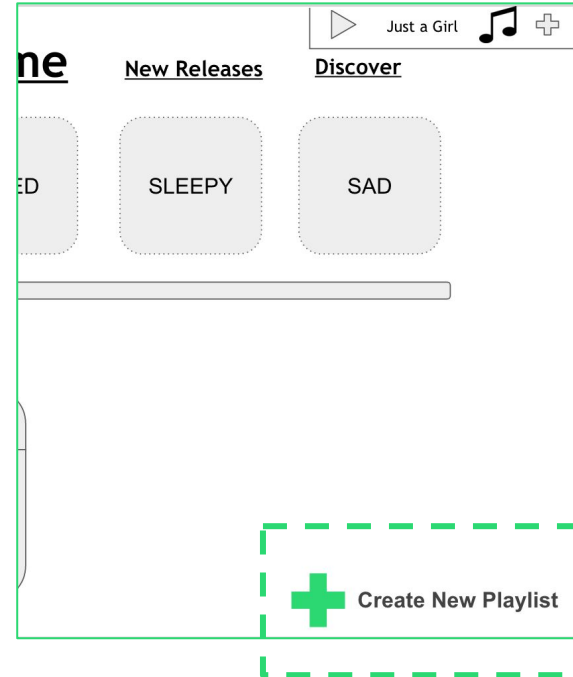


Heuristic Achieved

- **Flexibility of use and consistency with other music services**



Create New Playlist





Overall Usability

Trouble performing tasks

Error Prevention

High learnability

A close-up, slightly blurred image of a person's hands playing a guitar. The guitar has a light-colored body and a dark fretboard. The background is dark and out of focus.

Benefit and Limitations

Low-Cost

Immediate Feedback

Observe User

A close-up, slightly blurred image of a person's hands playing a guitar. The guitar has a light-colored body and a dark fretboard. The person is wearing a dark blue shirt. The background is dark and out of focus.

Benefit and Limitations

Low-Cost

Unsimulated

Immediate Feedback

Hawthorne Effect

Observe User

Facilitator dependent

Next Steps

**Improve
Discoverability**

**Expand
Horizontally**

**Test
Usability**

NEXT STEPS





Thank you for your attention!

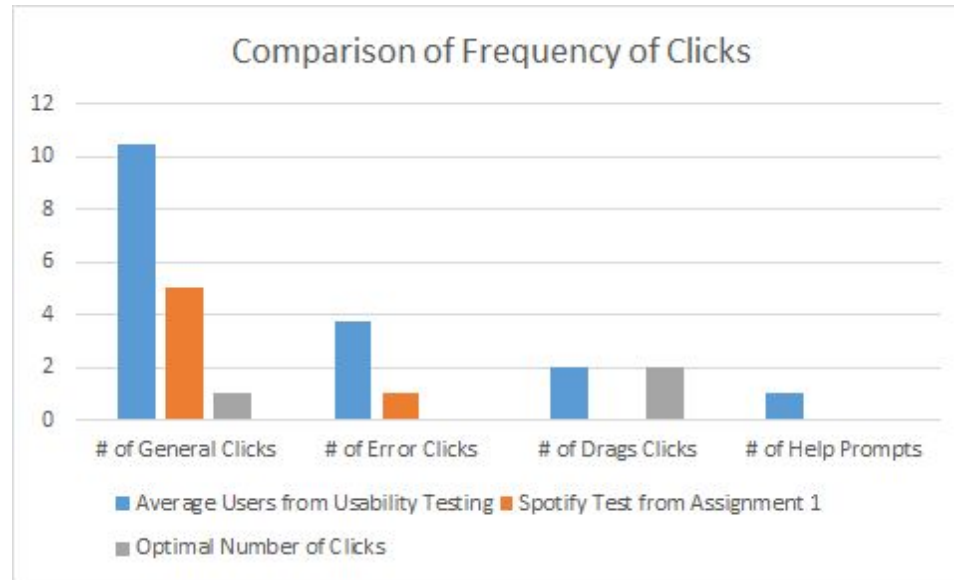
**We'd love to answer any
questions you have.**

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Appendix A

Figure 1: Comparison of Frequency of Clicks based on Quantitative Data



Appendix B

Figure 2: Time Taken to Determine Learnability Between Songs

