

Assignment M1 (Summer 2021)

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Abstract—We listen to music every day. Music can be inspiration or background noises when we are cooking, working, jogging, and driving. The audio streaming and media services providers such as Spotify have enabled us to access music whenever and wherever. This upcoming research is going to investigate the users' experience with exploring and building their music libraries in apps such as Spotify on different occasions.

1 PROBLEM SPACE

The problem space refers to the entire range of components that exist in the process of finding a solution to the problem. The problem in this study will be the convenience of 3 user experience components: exploring, searching music and adding it to the user's library when using music Apps such as Spotify. I'm hesitant to split the 3 components from one-another because these tasks are usually performed at the same time. According to the scriptures in 3.3 lessons, the problem space is **not just focusing narrowly on the user's interaction with a particular interface**. Therefore, the location in which the problem takes place should be all music services providers including, but not limited to Spotify or Apple Music. Elements of the environment surrounding the problem include networking interest such as music sharing among friends, convenience of locating the most frequently used function when jogging or driving, and music search when the user may not know the keyword to search. I'm interested in developing the segment of exploring and searching for music in these music Apps.

2 USER TYPES

Due to different legislation requirements across the world, I'm limiting the users to users in the United States for now. My user types would include novices and professionals in using music apps. And I'm grouping them into 4 categories based on the motivations of using these music apps:

- a. People who want to keep up with the updates in specific genres they listen to a lot in daily life. For example, users who listen to K-Pop a lot may want to follow the most trendy hits.
- b. People who randomly seek inspiration from music. These users can be those who are curious about what other people with whom they are related to are listening to. They can be someone who just had a good drink in a bar and all of a sudden found the background music that's been playing is very catchy.
- c. People who want hands-free experience with music. For example, an user who's throwing a party at home wants to put on some music which helps people get in the mood when he's busy socializing with everyone. People who jog or do road trips also want to minimize the times to change music lists because their attention is focused on somewhere else.

3 NEEDFINDING PLANS

3.1 Interviews

Who are the Users? I would interview frequent users of different music apps and ask them to compare their user experiences under different occasions. Specifically, I would interview both user groups who are on premium membership and user groups who are listening for free. For each person the interview will take approximately 30 minutes. And I'm planning on collecting verbatims from around 3-5 people.

Questions to be asked are: 1) What is your occupation? 2) Are you a premium member or free-listening user? 3) For how long have you used the app? 4) Have you used a different App previously?

Where are the users?/What's the context of tasks?

First of all, it's important to know whether the user is a frequent user or novice user of the app and whether the user experienced various Apps for different reasons. The reasons could be the designs of the Apps are most suitable for different occasions, or one App is more convenient or useful to help these users achieve their goals.

1) If you used a different App previously, what made you shift to the current App? 2) If you are using multiple Apps at the same time, what's the frequency of using each one of these Apps and when do you use each app? 3) Can you

describe a situation when you are the most happy with the music experience and why? 4) Can you give 1-3 examples when you are less satisfied with the current App and why? What else were you doing and where were you?

What are their goals?/ What do they need?

For premium members:1) What made you decide to convert to premiums? What were the features you are going after?

For Free-listening users: 1) What made you content with this app (or keep this app since “content with” could introduce confirmation bias)? When do you use it for? (May have some overlap with the general user questions listed below)

The above questions are designed to help me understand the main tasks these two groups of users are doing so I can ask more specific scenario questions based on the goal presented by these users.

What are their tasks? What are their subtasks?

It’s also important to help the interviewee to break down their thought process into subtasks. For example, when searching for a song the user has listened to, the user could either go to listening history, or quickly search for keywords, or go to his music library and look for it in the existing directory. By listing out the steps, we can a) quantify the steps it takes to complete a task; b) locate the pain point; c) understand the searching method/context the user is most comfortable with.

5) How do you search for songs or inspirations in this music app? 6) Can you describe the steps you took to finish music searching for each way you just described? 7) Which way is more pleasant and why? 8) Which feature of music exploration/search do you use the most frequently and which feature do you seldom use ? Why?

Potential biases I might encounter during this needfinding exercise include Recall Bias and Confirmation/Observer Bias. Confirmation/ Observer Bias happens if I design my questions in a misleading way or that I would smile at the answers which I “approve”. That’s why I try to ask what questions before asking how questions. Also, instead of asking about “convenient”, I asked about whether the experience was “pleasant”, since people’s definition of pleasant could vary. Also Recall bias happens when interviewees don’t recall precisely

what happened during their user experience. That's why it's important to ask the How questions 5-8.

3.2 Analysis of product reviews

App related product reviews are available on Apple Store and Google Play. I can run a program to scrape data from these App stores and analyze the text systematically.

Given the size of the data, text cleaning and filtering would take a long time so the most feasible way to do it is to apply a machine learning tool for the analysis:

- 1) After data scraping, eliminating the stop words from the text. Creating text of features with bag-of words and n-grams.
- 2) Keep reviews which have the highest correlation to the topic of interest.
- 3) **Who are the Users?** Identification on App Stores are usually hidden but the IP address would reveal the region information. To differentiate premium subscribers from free-listening users, I can search for key words such as "premium", "free", or "ads".
- 4) **Where are the users?/What's the context of tasks?** There are several ways to collect location and context of tasks. For each observation of collected reviews, we can look for the nearest sentences around prepositions such as "on", "at", "in". Reviews with strongest sentiments and long texts are more likely to have components of both.
- 5) **What are their goals?/ What do they need?** For each observation of collected reviews, we can look for the nearest sentences around verbs such as "want", "look for", etc.. Since I'm focusing on music exploring and searching, we will also deploy synonyms of "search" and "explore".
- 6) **What are their tasks? What are their subtasks?** This is probably the most difficult info to be collected. In reviews users usually would not break down their tasks but only leave comments on the specific pain points. And the pain points may vary based on user behaviors. For example, when searching for a song the user has listened to, the user could either go to listening history, or quickly search for keywords, or go to his music library and look for it in the existing directory. An app could be

convenient to be used for a group of users but inconvenient to another due to different using habits.

Potential biases for this approach is obvious: 1) Voluntary Response Bias. People who leave a comment in the app store tend to be deeply bothered with certain issues so their reviews could be a bit polarized and not objective. Some reviews could be fake and counterfeit due to marketing competition. The source of the reviews are difficult to verify. 2) Confirmation Bias. The reviews I filter into my analysis will be based on correlation to the words of interest I put together. If I mess up when a) putting together all the relevant terms, and b) performing text stemming and lemmatization, I may end up losing valuable information to the analysis. The solution to that is to a) run the words of interest by an experienced expert in text mining and b) double check to make sure that I don't only filter in side tilted reviews (such as reviews only with 2 stars or less). Maybe a weighted average score on each feature would help minimize the voluntary response bias.

3.3 Surveys

If there's enough time, I wish I could conduct interviews before the survey to form a more complete list of questions to research objects with whom I can't have direct interaction. In overall, I will break my survey down to 4 sections and am planning on collecting survey answers from around 10-20 people.

Surveys are different from interviews. I can't ask vague questions and need to keep it concise and sweet. I revised and downsized my interview questions in below the sections.

Who are the Users? 1) Are you a premium member or free-listening user? 2) For how long have you used the app?(limited options given, Others) 3) Have you used a different App previously? 3-a) If you have, which App did you use (limited options given, Others ____)

Where are the users?/What's the context of tasks?

Now it's time to ask about scenarios and the surrounding when using the app. I will classify the specific locations of the tasks and ask users to rate their experience. Below the questions are asked subsequently. If user answered No to the first question, questions a) and b) will be skipped.

4) - 9) Do you use the App when you work/work-out/drive/social/relax/Others?

4a)-9a) If you do, on a scale of 1(Very dissatisfied) to 5 (Very satisfied), how would you rate your experience when **exploring** the music?

4b)-9b) If you do, on a scale of 1(Very dissatisfied) to 5 (Very satisfied), how would you rate your experience when **searching** the music?

What are their goals?/ What do they need?

It would be exploring and searching for music. But just as I stated in Interview plans, premium members and Free-listening users have different needs and customer experience in terms of what's provided by the Apps.

For premium members:1) What made you decide to convert to premiums? What were the features you are going after besides Ads free listening experience? ([Multi-select] Friends music sharing/ weekly discover music/ wider music selection/ Others__)

For Free-listening users: 1) What made you content with this app?(or keep this app since "content with" could introduce confirmation bias) And then list out the limited options to free-listening users

What are their tasks? What are their subtasks?

It's also important to help the interviewee to break down their thought process into subtasks. It's important to be clear with the user's habits when break down the tasks. If customers select No in the main question, skip to b) automatically. If chose Pleasant/Very Pleasant in a), skip b).

Search Options -

10) Do you search for a song in the searching bar?

11) Do you search for a song in your listening history?

12) Do you go to your music library and look for it in the existing directory?

10a)-12a) On a scale from 1(Very Unpleasant) to 5(Very Pleasant), how do you rate this experience?

10b)-12b) What made you less satisfied/ stay away from the above feature?([Multi-select]: Limited options given such as too many clicks, confusing interface, didn't know this feature exists, etc.)

Exploring Options -

13) Do you explore music using a Radio Station?

14) Do you explore music using Discover Weekly?

15) Do you explore music using Daily Mix?

13a)-15a) On a scale from 1(Very Unpleasant) to 5(Very Pleasant), how do you rate this experience?

13b)-15b) What made you less satisfied/stay away from the above feature?([Multi-select]: Limited options given such as too many clicks, confusing interface, didn't know this feature exists, etc.)

Potential biases I might encounter during this needfinding exercise would be Confirmation/Observer Bias. Confirmation/ Observer Bias happens if I design my questions in a misleading way or that I would prompt sub-questions with encouraging tones at the options which I “approve”. That’s why I try to have this neutral tone in my survey scripts. Also, the sub-questions are prompted up to users based upon their answers to the main questions. Some of you may raise questions about why I only ask dissatisfied users the specific “why” questions. That’s because the content users are normally not aware of which part the product is doing well until they encounter an unpleasant experience so they can tell the difference. That’s why I’m hesitating about asking satisfied users why they are satisfied with the interface. Since I will explicitly list all the subtasks which are relevant to the goal. The chance for Recall Bias is minimized.