Università degli Studi di Trento

BSc in Science and Technology of Cognitive Psychology

Cognitive Ergonomics

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EVALUATION OF USABILITY OF THE APP

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I. INTRODUCTION

1. INTRODUCTION AND AIM OF THE TASK

This work describes the phases of analysis of the usability of the mobile application of Spotify, a digital music service that provides access to millions of songs. The project aims to evaluate the interface's usability and some of the app's features.

2. THE PHASES

Why I chose this artifact

As a music fan, I am a daily user of the app and, although in most cases the user experience is excellent, sometimes I come across some more or less unpleasant situations, which consequently affect it.
So I wanted to research to assess if other users encounter similar problems and to evaluate their user experience.

What I evaluated

I wanted to understand what are the characteristics of the interface that can induce the user to error or somehow complicate the user experience.

In which context I conducted the research

I conducted the research in a natural setting.

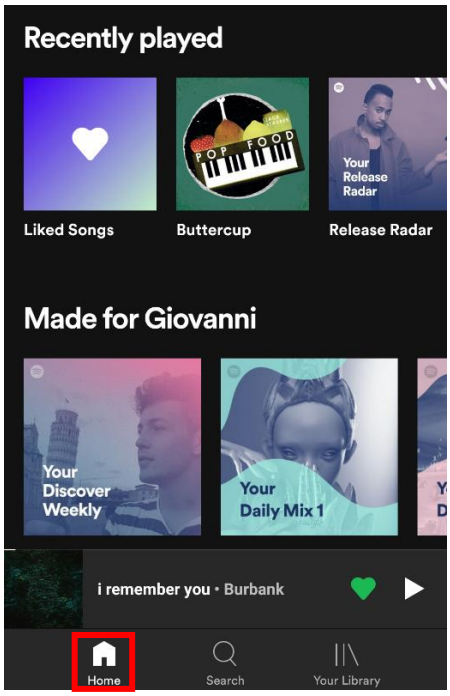
In which phase of design

The product is already available to the public.

Which methods I used

After performing the Heuristic Evaluation to identify interface problems, I used the Cognitive Walkthroughs to evaluate the ease or difficulties a user can have in learning how to interact with the interface. Finally, because I needed a large sample to be representative, I opted for an online questionnaire for the data collection phase.

II. PRODUCT DESCRIPTION



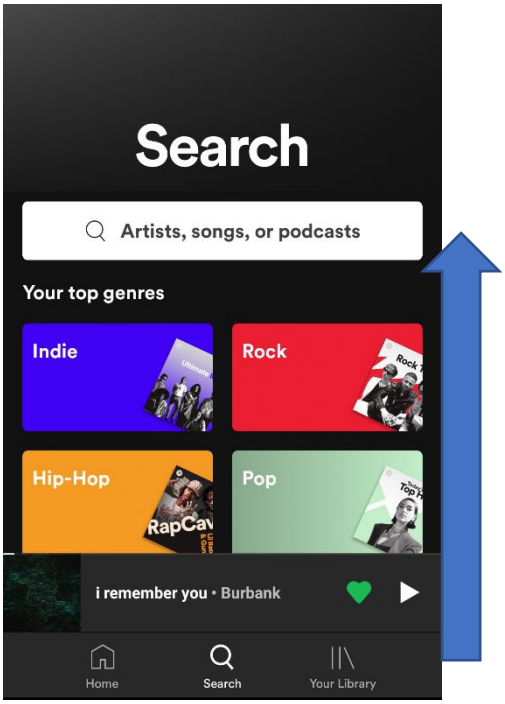
1 2 3

The interface has three main pages accessible by as many icons: **(1) Home**, **(2) Search** e **(3) Your Library.**

The default page is **Home.**

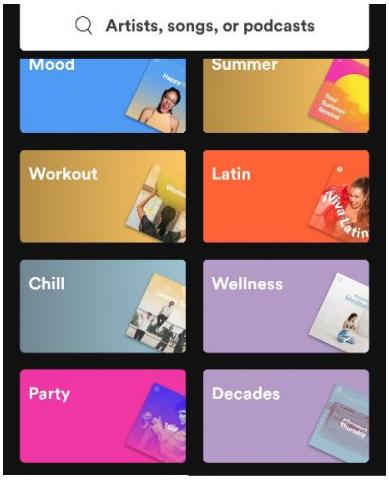
Home contains about 20 sections of variable number and content of playlists, depending on the most listened artists and songs. Each section has a horizontal scroll menu.

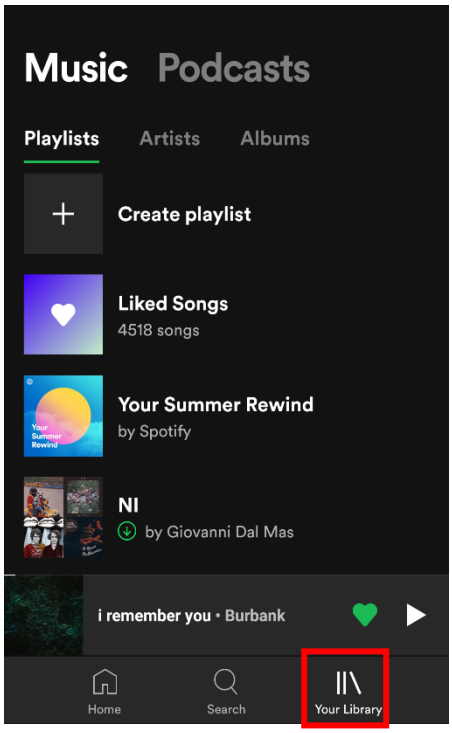
Among the sections that remain fixed: "**Recently played**", "**Made for you**" (containing lists such "Discover Weekly", the six "Daily Mix" and the "Release Radar", which I will deepen later in the report), "**Recommended for today**" and more.

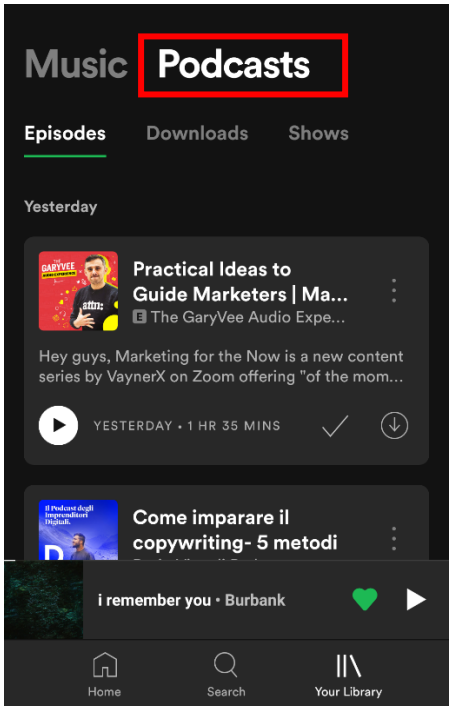


Pressing the "magnifying glass" icon opens the page **Search** which comes with a large and visible search bar and **sections organized by Genres** below.

Scrolling the page you can also find **sections organized by Theme** (Relax, Focus, Workout, Chill, etc.)







The last page, **Your Library**, is divided into two macro-sections: "**Music**" and "**Podcast**".
The macro-section Music is in turn tripartite in:
"**Playlist**" (containing playlists created or followed by the user);
"**Artists**" (in which are present the artists of the songs saved in favorites);
"**Albums"** (with albums containing the user's favorite songs).
The Podcasts macro-section is divided into: "**Episodes**", "**Downloads**" e "**Shows**".

III. HEURISTIC EVALUATION

The Heuristic Evaluation is an evaluation method, based on the use of a series of points on very precise aspects, which must be systematically evaluated on our product. The purpose is to detect any problems in the interface. The points to be systematically evaluated are also called heuristics and for my evaluation I used the *revised version* (2014) of ***Jakob Nielsen's 10 Heuristics***.

1.VISIBILITY OF SYSTEM STATUS

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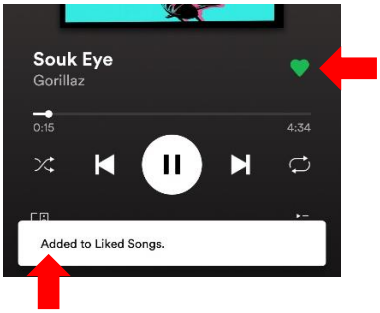
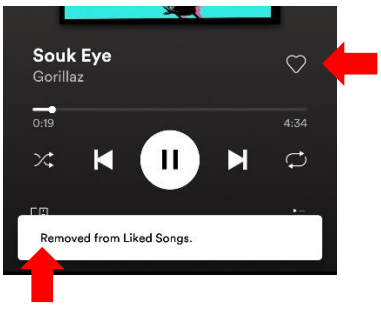
The user is always notified of any changes to the state of the system, whether due to actions performed by the person or download uploads.

EXAMPLES:



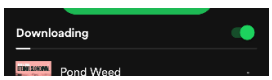
Add one song to Liked Songs:

- The hearts/like icon turns green
- A **pop-up** at the bottom indicates that the song has been **added** to Liked Songs



Remove a song from Liked Songs:

- The hearts/like icon turns empty
- A **pop-up** at the bottom indicates that the song has been **removed** from the Liked Songs
-



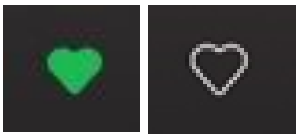
Shuffle: on/off
Repeat all the songs: on/off
Download status

2. MATCH BETWEEN SYSTEM AND REAL WORLD

8/10

The main icons and actions are intuitive thanks to a good correspondence with the concepts and actions in the real world.
However there are some instances where the icon is not very clear, but the user can easily guess the function after a few uses.

EXAMPLES:



Add / Removed Liked songs:
The heart-liked association is effective because it is akin to the meaning of a heart in the real world.

Also the icons used for the following functions are effective:

- **shuffle** (1)
- **back** (2) **pause** (3) **forward** (4)
- **repeat all the songs** (5)

Their arrangement is consistent with a person's mental pattern (back-pause-forward) and you can also drag the song's duration bar back and forth as you would expect to be able to do.

Icon 6, depicting a screen and a stereo, intuitively indicates the possibility of **connecting with other devices.**
Lo stesso non si può dire delle icone 7 e 8.
Icon **7** indicates **add to the queue**, while icon **8** allows to **go back**; however for the latter an icon of this type "< " would have been more consistent with the mental model (< =back)

3. USER CONTROL AND FREEDOM

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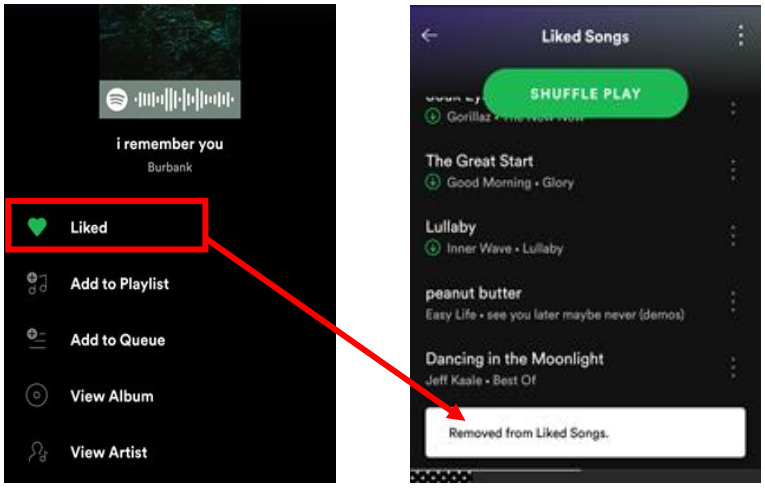
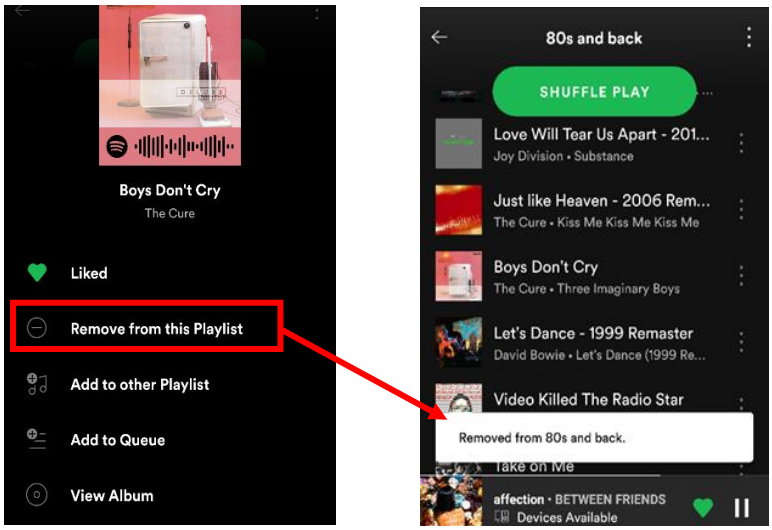
The interface allows you to select several functions by mistake, without providing an "undo" option or a way to quickly remedy the error. This can be frustrating for the user who commits the action unintentionally.

EXAMPLES:



Remove a song by mistake from the Liked Songs:

In case a song is removed by mistake from the Favorites, action far from improbable, given the proximity to the command "Add to playlist", the song will be removed and a pop-up will appear to notify us. However, it will not be possible to interact with the pop-up and to add the song again. The user will have to search for it again in the search engine.



Remove a song by mistake from a Playlist:

The same will happen if we select mistakenly **"Remove from this Playlist".** A pop-up will appear with which it is not possible to interact and the user will be forced to go to search for the song again among the Favorites or in the search engine; actions that can be frustrating.

4. CONSISTENCY AND STANDARDS

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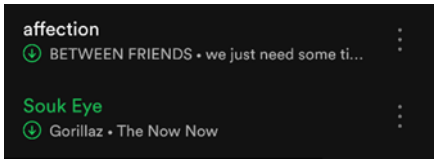
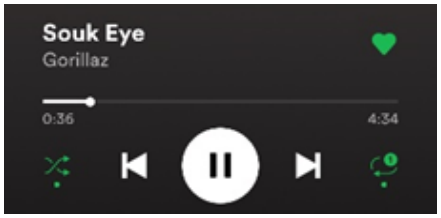
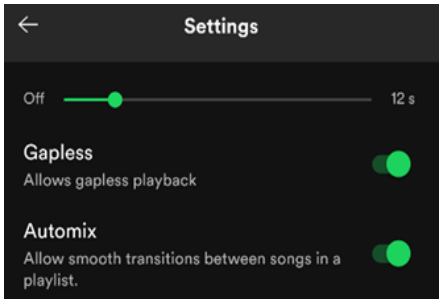
The interface is consistent in using similar terminology and visual language for similar actions and functions.

EXAMPLES:



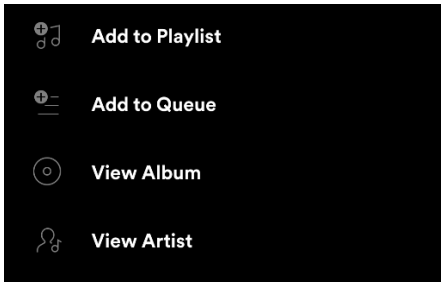




Using the color GREEN:

Inside the interface, the green color always indicates the status of the action **performed**, the **currently active** function, or the song/playlist **playing**.

Colors and types of commands are kept consistent even in the **settings** section, where for example the command to activate some settings is the same to activate downloads.



Similar terms are used to indicate similar actions. For example, "**Add to...**" or "**View...**".
Also, commands that plan to "add something" have similar icons.

5. ERROR PREVENTION

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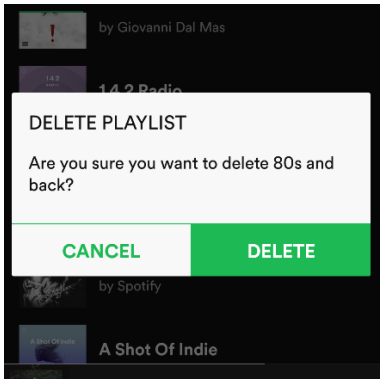
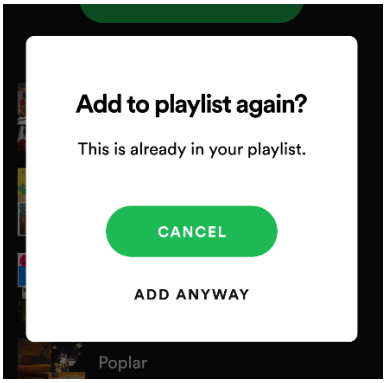
The interface offers support to prevent most errors resulting from an unintentional or incorrect action, presenting confirmation options. However, there are some exceptions.

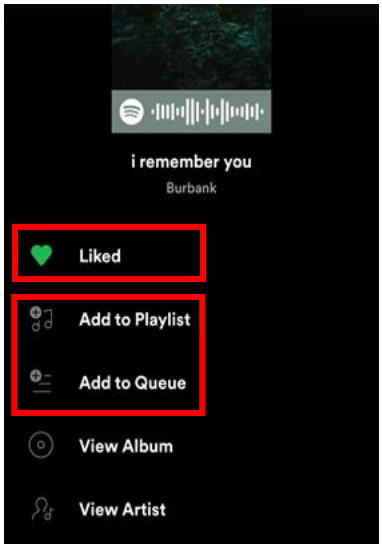
EXAMPLES:

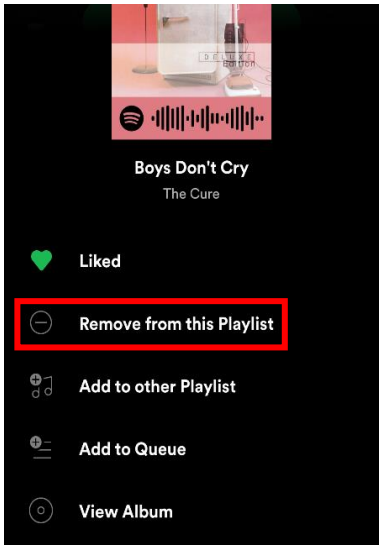




Confirmation for:

- Delete Playlist
- Add a song already in the playlist





A **confirmation** is **NOT** provided for actions such as:

- Remove a song from Liked Songs
- Remove a song from a Playlist

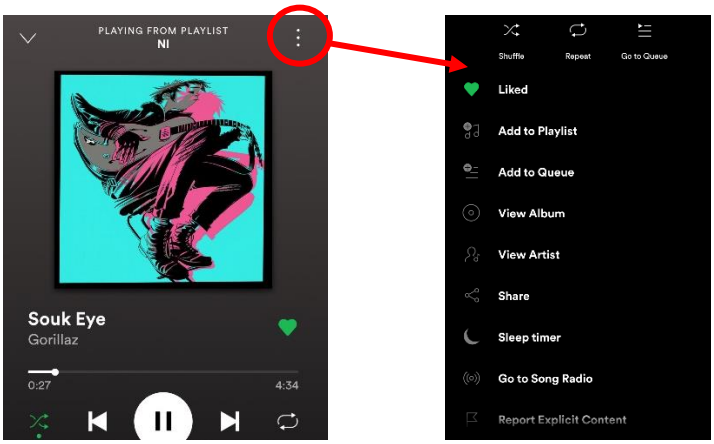
In addition, actions from similar commands such as "**Add to Playlist**" and "**Add to Queue**" are placed too close to each other and without confirmation options. This can result in frequent wrong actions.

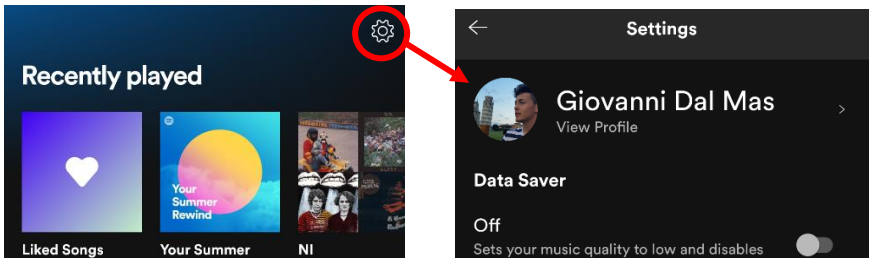
6. RECOGNITION RATHER THAN RECALL

6/10

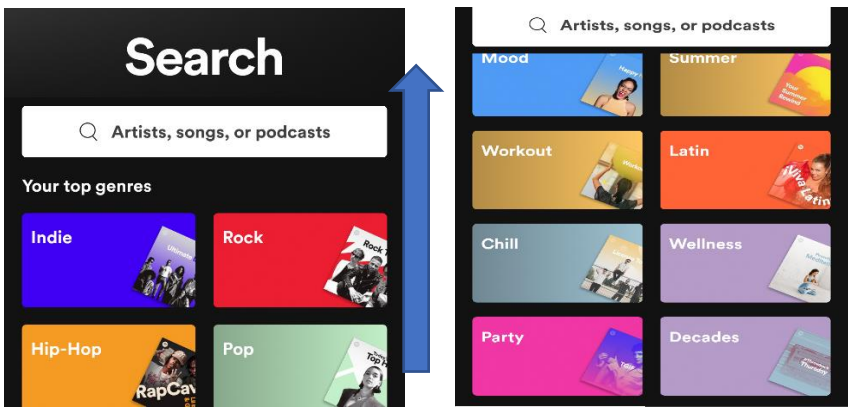
By pressing the "three dots" icon you can see the main possible actions. In addition, the search bar suggests results based on the letters entered so far. However, in various situations, the interface forces the user to remember the location of certain icons or options.

EXAMPLES:





To access the personal **Profile** it is necessary to remeber that it is loacted in the options menu.



If you are not aware that you have to **scroll up** in the **Search** menu, you will not find that you can access numerous collections and playlists organized by genre and need from here.

7. FLEXIBILITY AND EFFICIENCY OF USE

6/10

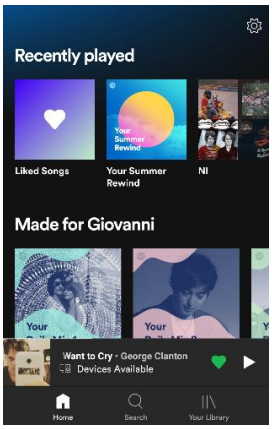
The interface has basic commands, without shortcuts to achieve a result more efficiently. Experienced and inexperienced users must then perform the same actions to complete a task. The search bar is not very flexible, in fact you need to type the exact letters and words to find a song or artist.
However, it should be noted the presence of algorithms that make it easier to find the most played playlists and create custom ones based on user tastes (Daily Mix, Discover Weekly, Release Radar, etc.)

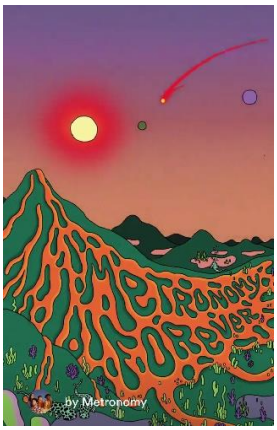
8. AESTHETIC AND MINIMALIST DESIGN

8/10

Although the Home page is quite full of sections (as many as 20), these are categorized clearly in a horizontal scrolling menu very practical and pleasant to use. Perhaps the settings menu is not as practical, with about 35 options in one vertical section, but with a little practice, it becomes easy to consult. Surely aesthetics is one of the strong points of the interface. From the various menus of modern design to the tracks provided with images of the album/ single and sometimes video or captivating animations.

EXAMPLES:





9. HELP USERS RECOGNIZE, DIAGNOSE AND RECOVER FROM ERRORS

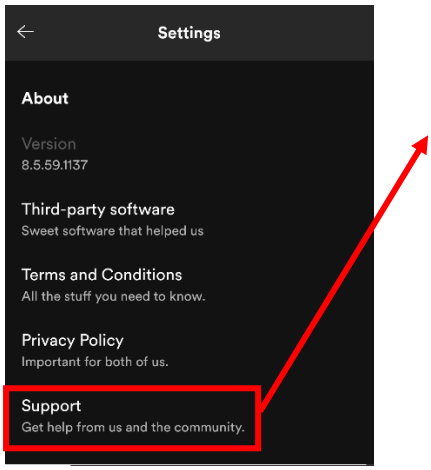
6/10

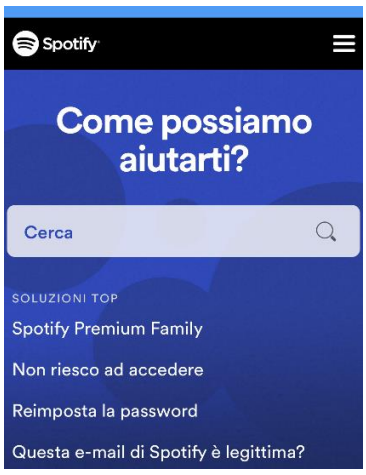
There are no actual error messages, other than the confirmation options mentioned above.

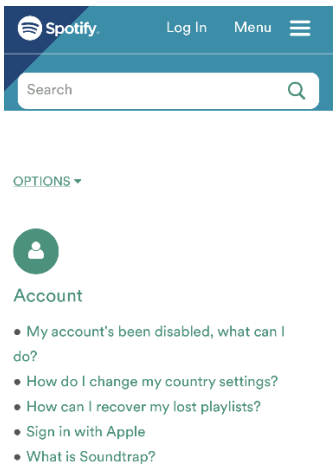
10. HELP AND DOCUMENTATION

8/10

At the bottom of the settings are options to access support, terms and conditions, and privacy policy. From the support, you can access the FAQ and the community. However, you need to explore the support page and community a bit before finding the answer to the problem.







DEBRIEFING SESSION

This assessment shows that the main problems are as follows:

- **Lack** of "**undo**" options to quickly fix wrong actions;
- **Lack** of a **confirmation option** before removing a song from Liked Songs or a Playlist;
- **Actions** from **similar commands** placed **too close** to each other and without confirmation options;
- **Some features** are **unclear** or **not visible**;
- **Profile** accessible **only from** the **Settings menu**, it could be made more visible.

Problems that can be considered marginal, but that can still affect the user experience are the following:

- Some **icons** are **not very clear** at first use;
- **Home** and **Settings** menu a little too **full of sections**;
- **Lack** of a **search bar** when you want to **add a song to another playlist**; you then need to scroll to search for the last one, an action that may take a little too long with long lists of playlists;
- **Community page** is **not** very **clear**.

IV. COGNITIVE WALKTHROUGHS

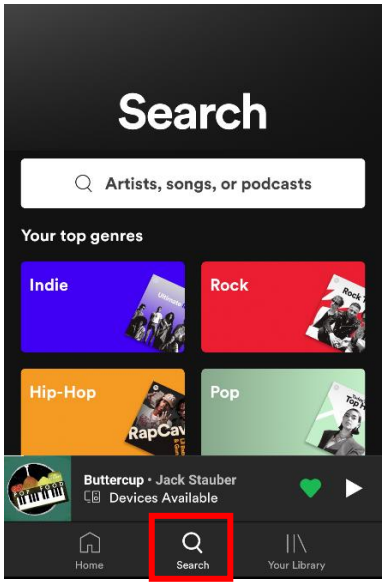
The Cognitive Walkthroughs is a method for evaluating usability, carried out by experts. The method involves a detailed analysis of the individual steps that the user puts in place to perform a specific task. For each step that goes to analyze the expert must answer four very precise questions, taking into account the cognitive limitations, mental models, and user expectations in the interaction with the interface. The four questions are the following:

a) Is the effect of the current action the same as the user's target? Is the **right conceptual model** present in the user's head?
b) Is the correct action sufficiently obvious for the user? Is there **good visibility**?
c) Does the user notice that the correct action is available? Is there **good recognition**?
d) Is the user able to interpret if the action was successful? Is there a **good understanding of the feedback**?

The task that I decided to analyze is "***Add a song to a playlis***t" and I recognized these **six steps** necessary to complete the action:
(1) select the "Search" menu, (2) search for the song, (3) select "Song Options", (4) select "Add to Playlist", (5) search for the playlist, (6) select the playlist.

	Right conceptual model?	Good visibility?	Good recognition?	Good understanding of the feedback?
1. Select Search menu	Yes	Yes	Yes	Yes
2. Search for the song	Yes	Yes	Yes	Yes
3. Select "Song Options"	Yes	Yes	Yes	Yes
4. Select "Add to the Playlist"	Yes	Yes	Yes	Yes
5. Search for the playlist	No	No	No	Yes
6. Select the playlist	Yes	No	Yes	Yes

1. Select "Search" menu



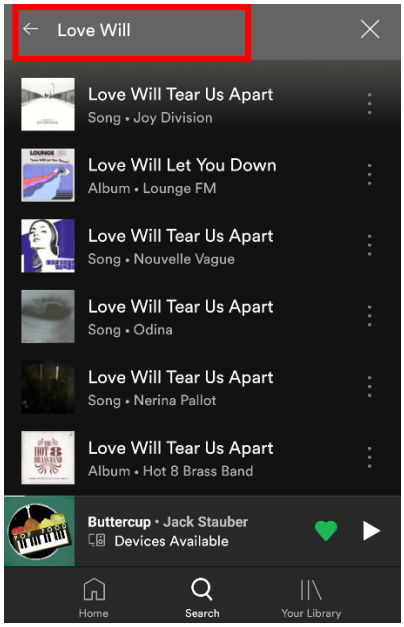
a) conceptual model **yes**, you expect to find the search menu among the main icons at the bottom;

b) visibility: **yes**, the icon is visible;

c) recognition: **yes** the icon is visible;

d) feedback: **yes**, you access the search bar.

2. Search for the song



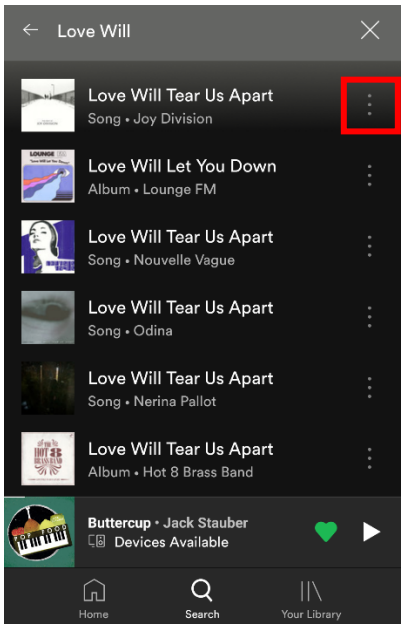
a) conceptual model **yes**, you expect to type on a search bar to look for something;

b) visibility: **yes**, the correct action is clearly visible;

c) recognition: **yes** the search bar is well recognizable as a tool to search for something;

d) feedback: **yes**, as soon as you start typing, the first results appear consistent with the search.

3. Select "Song Options"



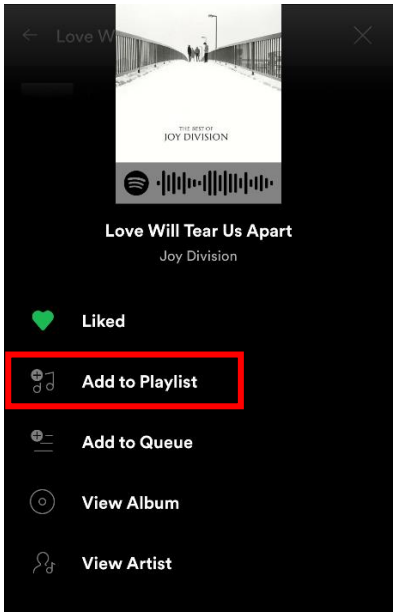
a) conceptual model **yes**, we expect to have an icon to select next to the song (the "three dots");

b) visibility: **yes**, the icon is clearly visible;

c) recognition: **yes** the icon is well recognizable, being one of the universal symbols to access options on a digital interface;

d) feedback: **yes**, once the icon is pressed, a menu opens where the options are listed.

4. Select "Add to Playlist"



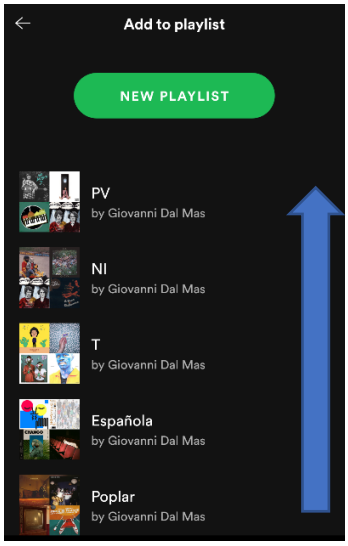
a) conceptual model **yes**, it is expected to find the option "Add to Playlist" among the first;

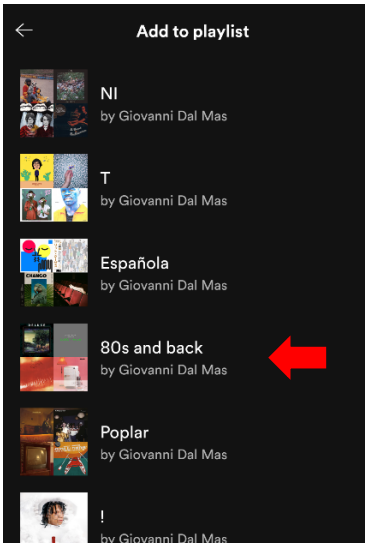
b) visibility: **yes**, the command is clearly visible;

c) recognition: **yes** the command is clearly recognizable and is also accompanied by an intuitive icon;

d) feedback: **yes**, a menu opens with the list of available playlists.

5. Search for the playlist





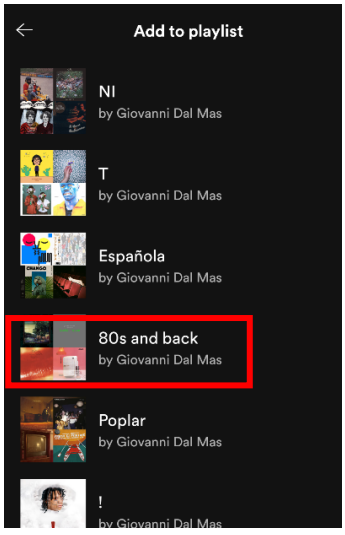
a) conceptual model **no**, you would expect to be able to search the playlist through a search bar, but it is not present;

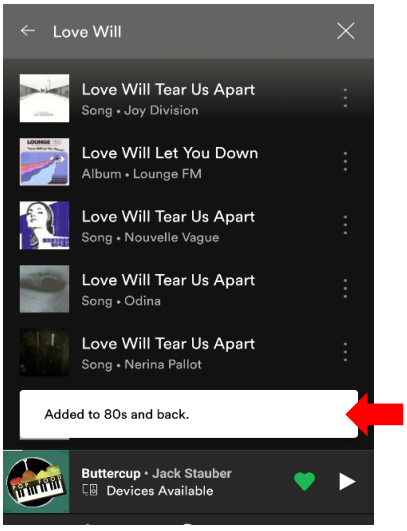
b) visibility: **no**, the scrolling action to search for the playlist is not clearly visible, being there no vertical scroll bar;

c) recognition: **no** it is not optimal, as you realize that you have to scroll only trying, after having ascertained the lack of a search bar;

d) feedback: **yes**, playlists flow smoothly.

6. Select the playlist





a) conceptual model **yes**, you expect to select something by pressing on it;

b) visibility: **no**, sometimes the playlist is not immediately visible and you have to scroll to find it;

c) recognition: **yes** the action is clearly recognisable;

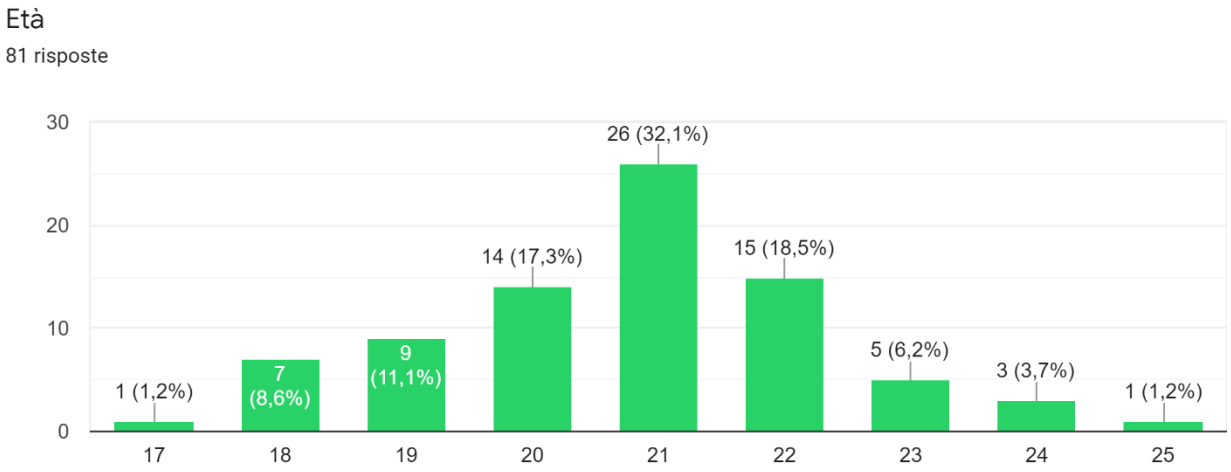
d) feedback: **yes**, as soon as the playlist has been selected, a pop-up appears notifying us that the song has been added to the playlist.

V. ANALYSIS OF THE ONLINE QUESTIONNAIRE

I shared a questionnaire online to gather users' opinions about the usability of the application. Users were asked to answer questions mainly regarding the usefulness of certain features, the ease or otherwise of performing certain actions, and positive and negative aspects of the application.

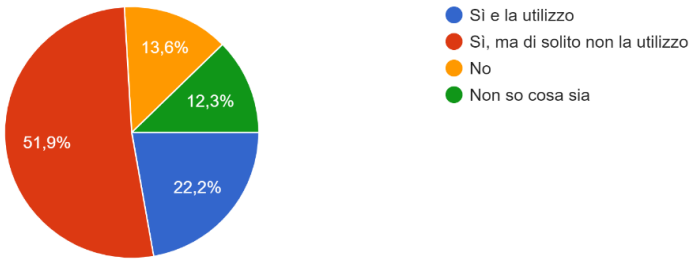
As for the format of the answers I used multiple answers, checkboxes, short answers, long answers, and scales to six points (chosen in even numbers on purpose to force the user to pick a side towards a more negative or more positive response).

The questionnaire was answered by **81 people**, including 30 men and 51 women, aged between 17 and 25.



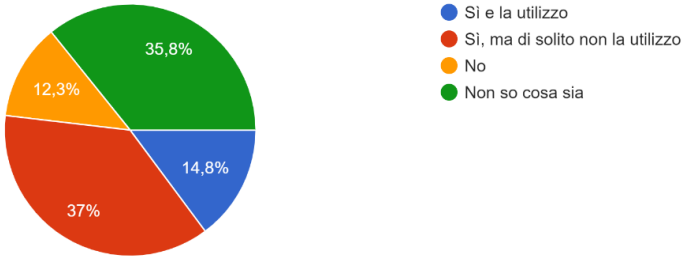
INSIGHTFUL QUESTIONS AND ANSWERS

Trovi utile la playlist "La tua Discover Weekly"?
81 risposte



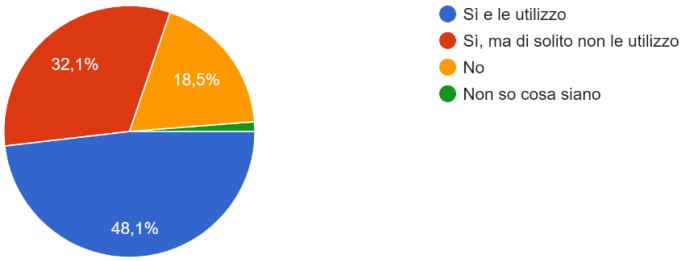
As many as **87.7%** of respondents **know** about the **"Discover Weekly"** feature and **74.1%** find it **useful**. Such a high percentage of people who know the playlist reflects the fact that this is the first proposal in the Home section "Created for you" and is therefore **very visible**.

Trovi utile la playlist "Il tuo Release Radar"?
81 risposte



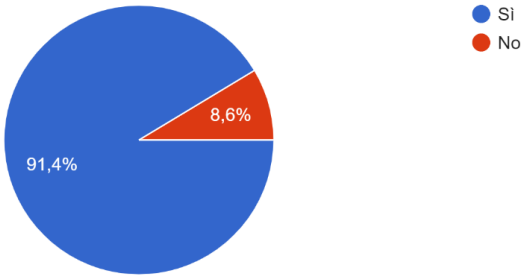
Here the significant fact is that **35.8% do not know** what is the "**Release Radar**" (playlist containing songs released recently by the artists you listen). One reason could be the fact that it is **hardly visible** in the Home. You have to scroll through seven playlists in the "Made for you" section before you find it.

Trovi utili le playlist "Il tuo Daily Mix"?
81 risposte



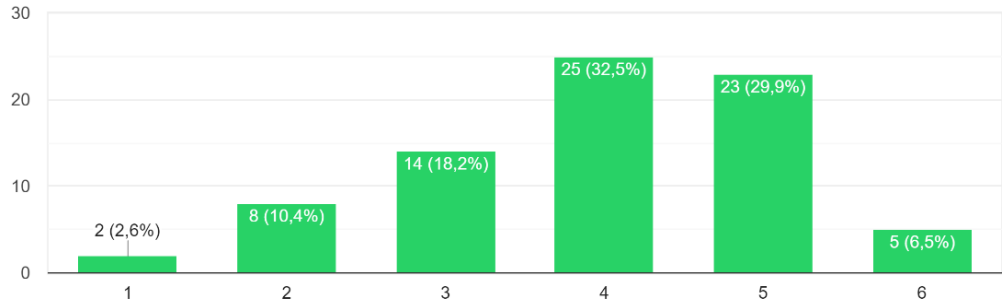
On the contrary, only the **1.2%** of people **does not know** what "**Daily Mix**" playlists are. In fact, these are among the **most prominent** playlists in the Home and there are six versions, each containing a mix of different artists.

Utilizzi playlist di Spotify per rilassarti, studiare o allenarti?
81 risposte

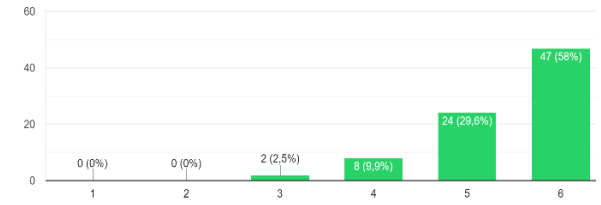


The relevant fact is that the **average score** given to ease in finding the right playlist is **3.77**, a **positive** score, **but not very high** on a 6-point scale.
One reason might be that many people are **not aware** of the **playlists organized by genre** in the "Search" section, which are **not very visible** (see point 6 Heuristic Evaluation), and then they simply use the search bar to search for keywords, which is more time consuming.

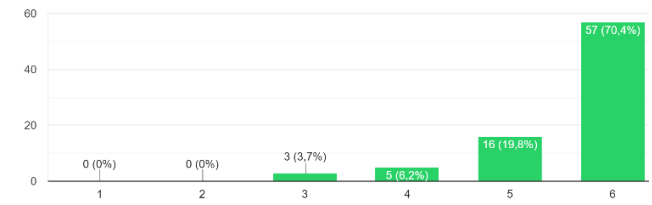
Se sì, su una scala da 1 a 6, quanto facilmente trovi la playlist adatta? (1=per nulla facilmente, 6=molto facilmente)
77 risposte



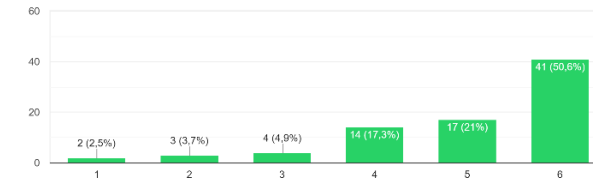
Trovo facile cercare una canzone o un artista su Spotify.
81 risposte



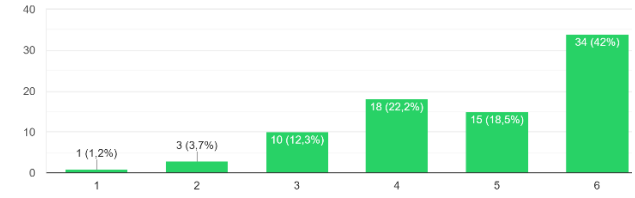
Trovo facile aggiungere una canzone ad una playlist.
81 risposte



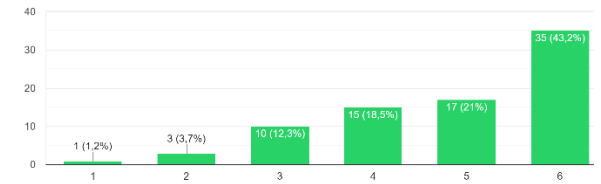
Trovo facile aggiungere una canzone alla coda di riproduzione.
81 risposte



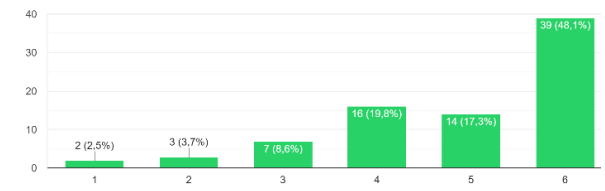
Trovo facile condividere una canzone sui social.
81 risposte



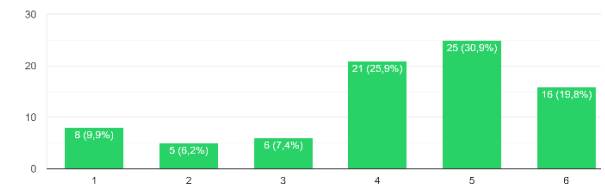
Trovo facile condividere una playlist con un amico/a.
81 risposte



Trovo facile condividere una canzone con un amico/a.
81 risposte



Trovo che Spotify mi permetta di eseguire ogni azione che voglio.
81 risposte

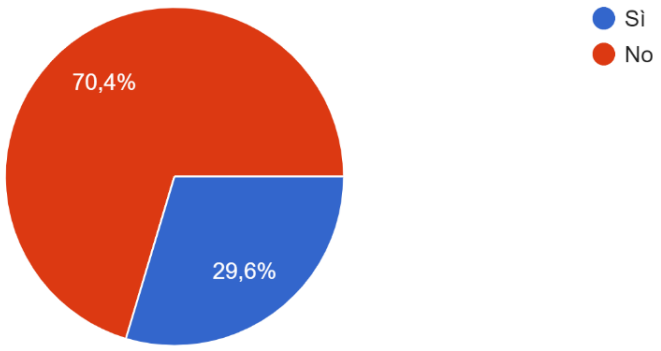


Here are some possible actions within the app and the respective score given by users to the ease in putting them into practice from 1 to 6 (1=not easy at all, 6=very easy).

With an average score of **5.57** "**Add a song to a playlist"** is considered the **easiest action**. This is compatible with the results of the Cognitive Walkthroughs, in which it emerged as most of the steps needed to complete the task are compatible with the mental model, clearly visible, well recognizable and followed by understandable feedback. It follows "**Search for a song/artist**" with **5.43**.

The **lowest average scores**, although still positive, are "**Share a playlist with a friend**" with **4.84** points of average and "**Share a song on social media**" with **4.79**. An explanation for these scores can be found in the fact that, both in the options menu of the song and in that of the playlist, the **"Share" button** is **not immediately visible** and you have to scroll to find it.

Ti capita mai di premere l'icona o la funzione sbagliata perché troppo vicina ad un'altra?
81 risposte



Interesting also to see this figure: **29.6%** of people happened to **press** the **wrong icon or function because** it was **too close to another**. The most reported cases were the following::

- Press **"Add to queue"** instead of **"Add to playlist"** or vice versa (problem already emerged from the Heuristic Evaluation, in point 5. Error Prevention);
- Accidentally **remove a song from favorites** instead of **adding it to a playlist** (the "Add to playlist" button is close to the "Like" key which, if pressed for a song already in favorites, removes it. See Heuristic Evaluation, step 5. Error Prevention).

Regarding the positive and negative aspects below are the most reported for each category.

POSITIVE ASPECTS:

Intuitive, simple, fast and smooth interface

- **Modern** and **user-friendly** app design
- **Great variety** of songs and artists
- Playlists **customized by the algorithm**, which also finds songs similar to those listened
- Existing **playlists** for the **different Moods** of the day and organized by Themes
- Playlists and songs that **can be shared** on social media and with friends (collaborative playlists)
- Ability to **easily discover new music** in many different ways
- Ability to **listen** to music **in the background** and with your phone locked
- Ability to have **podcasts** and **songs** in **one app.**

NEGATIVE ASPECTS:
(most of the comments are about the price, but I just report those regarding the interface and content)

- **Settings not too easy** to use
- **Icons and functions too close**
- It is **not very automatic** to find your **Profile** and find your friends to follow
- **Lack** of **some original tracks**
- **Some custom playlists** are **not satisfactory**
- To **search for a song/artist** you **need** to **enter** the **exact letters and words.**
-

VI. CONCLUSIONS AND FURTHER IMPROVEMENTS

In conclusion, from this analysis emerges as also a digital music service like Spotify, among the best in the industry, there is room for improvement and some interface problems to review, despite the already excellent user experience. Here are some **suggestions for improving** the main problems I have encountered:

- **Introduce "undo" options** to quickly correct wrong actions, for example by allowing interaction with the pop-up that notifies the main actions (see Heuristic Evaluation, step 3. User control and freedom);
- **Introduce** a **confirmation option before removing a song** from Favorites or a Playlist;
- **Distance** options for **similar commands** by at least one location**, to prevent** the other from being **selected by mistake** (e.g. "Add to playlist" / "Add to queue") or at least introduce a confirmation option**;**
- **Make** the **scrolling option clearer** to avoid features or content remaining poorly visible (e.g. Playlists categorized by themes in the Search page), perhaps by **inserting a small scroll bar** to make the action more obvious;
- Make access to the **Profile more obvious and intuitive,** perhaps by inserting an **icon** in the upper right that remains **fixed** between the menus;
- **Introduce** a **search bar** when you want **to add a song to a playlist,** to allow you to find the desired playlist faster, especially when the list is large**.**