

## **Interface Evaluation of Spotify for iOS**

### **Description of the Spotify Interface**

The Spotify application for iOS is an audio streaming platform which allows users to browse and listen to music, podcasts and audiobooks. The User Interface (UI) includes three main windows between which the user can navigate at the bottom of the screen, as well as an expanded currently playing view. The main “Home” window is described in Figure 1, and the remaining windows shown in Figures 2-4.

Figure 1: Home view on Spotify

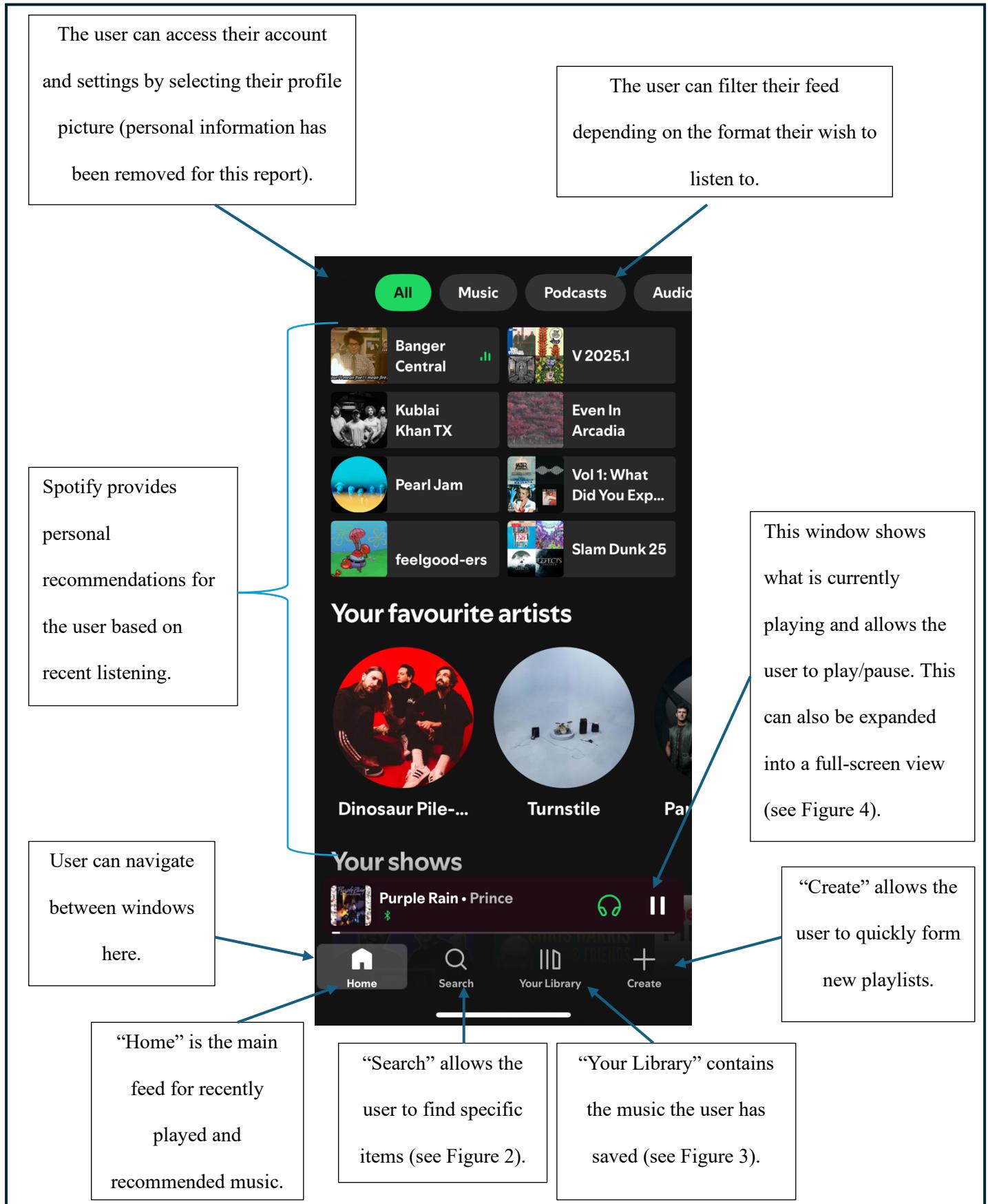


Figure 2: The Search View

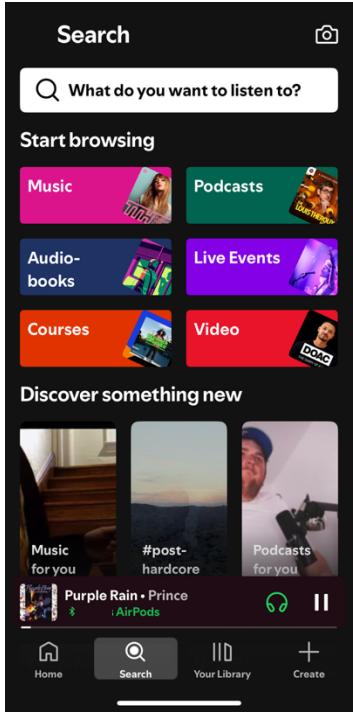


Figure 3: Your Library

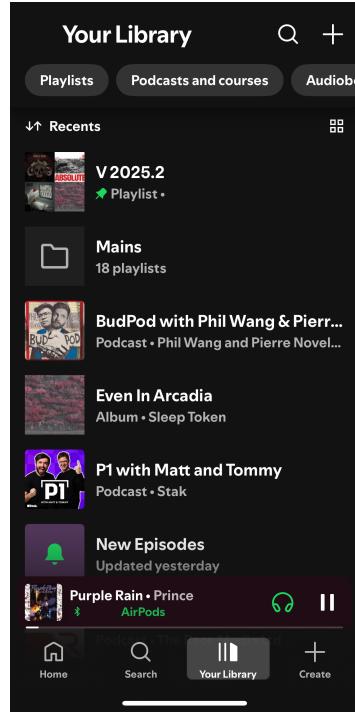


Figure 4: Currently Playing



## Persona, Scenario and Task Development

### Persona

Olivia is a 38-year-old primary school teacher from Bath. She used to live with her husband, Daniel, but since he passed away she now lives with her mother, Elissa, who just turned 75. Olivia doesn't consider herself particularly tech-savvy, often needing help with using the projector in her school classroom. However, Olivia has become more technologically proficient since moving in with her mother as she must do the jobs Daniel used to take care of, such as cooking with the air cooker, operating the boiler and paying the bills online. Olivia is also a proficient iPhone user, using her iPhone every day for Facebook, online shopping, and listening to music on Spotify. She appreciates intuitive technology and her favourite iPhone apps are those

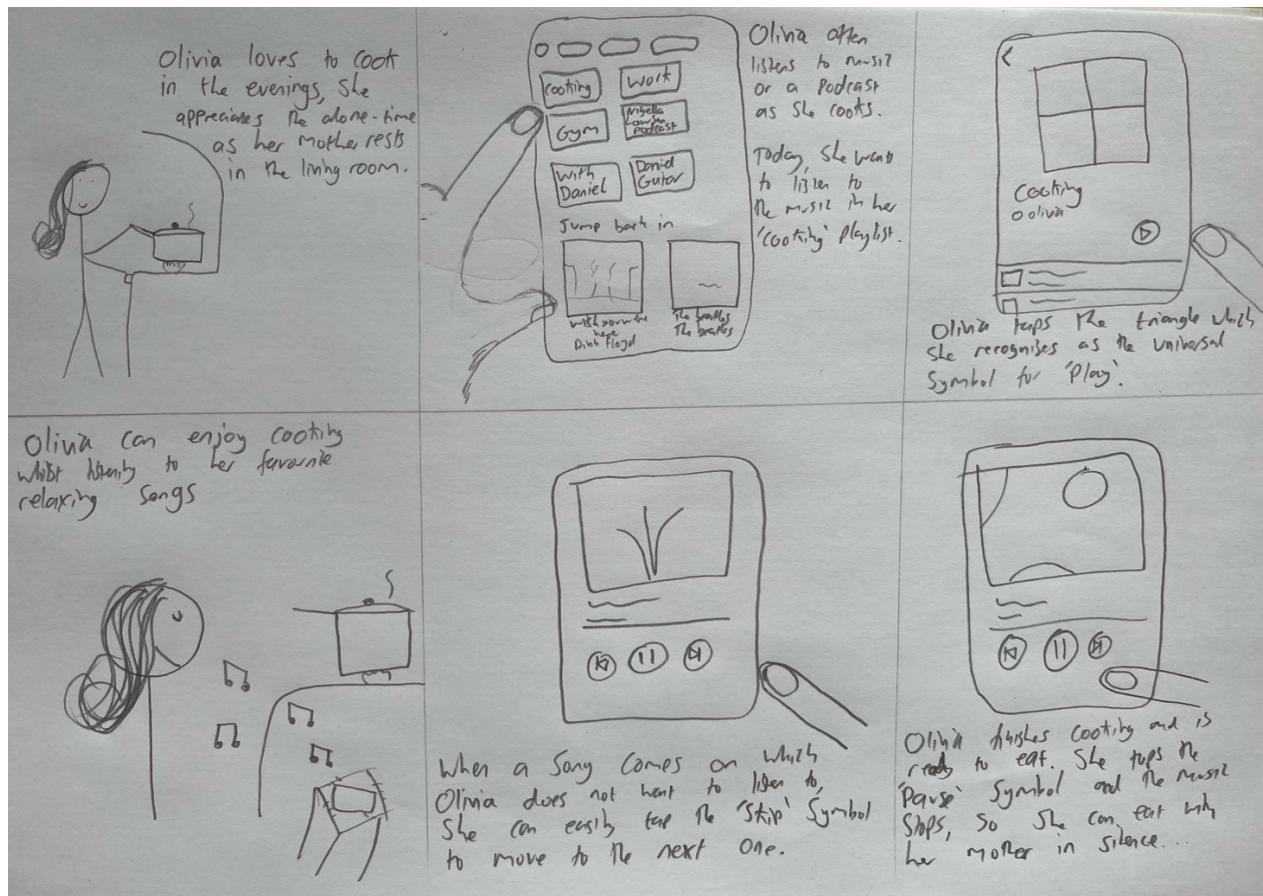
which can provide a personal or tailored touch. Olivia and her late partner shared a deep love for music; Daniel was a guitar player and had they had curated dozens of playlists together which they often listened to whilst cooking, walking, or travelling. After Daniel's passing, Olivia found solace in revisiting his favourite songs and playlists. It became a quiet way to feel connected to him and hold onto shared memories. She now uses Spotify not just for entertainment, but as a meaningful emotional outlet.

### **Scenario**

Every Sunday, Olivia takes a long walk along the canal to reflect and unwind from a busy workweek. Since Daniel's passing, this has become a large part of Olivia's life as it brings a necessary comfort. As she ties her boots and leaves the house, she opens Spotify, selects "Your Library" and scrolls down to her "With Daniel" playlist. She taps on the playlist and then the "Play" button. Later, as she sits by the water, Olivia wants to listen to one of her personal favourite songs, but she wants her "With Daniel" playlist to continue after the song ends. To do this, Olivia knows she should add the song to the queue. First, Olivia searches for the song in the "Search" window - the song appears at the top of the suggestions after just a few letters. Then, as an experienced user of Spotify, Olivia knows the shortcut for adding a song to the queue is to swipe right on the song title. After completing this action, Olivia knows her chosen song will be the next to play, and she begins to walk back home.

Figure 5 is a storyboard demonstrating another scenario.

Figure 5: Storyboard



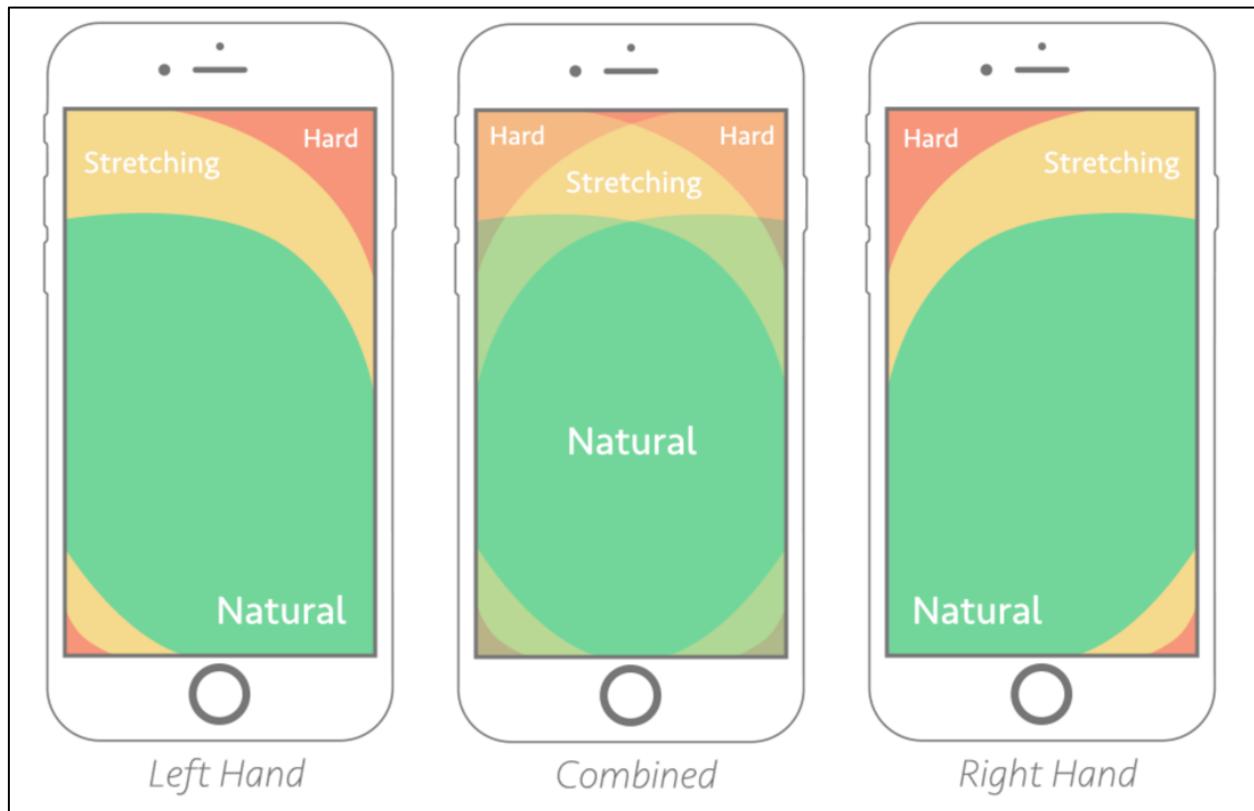
## Theory-Led Investigation of the Interface

### Physical Level

For all mobile interfaces, it is important that they consider the physical limitations of the user.

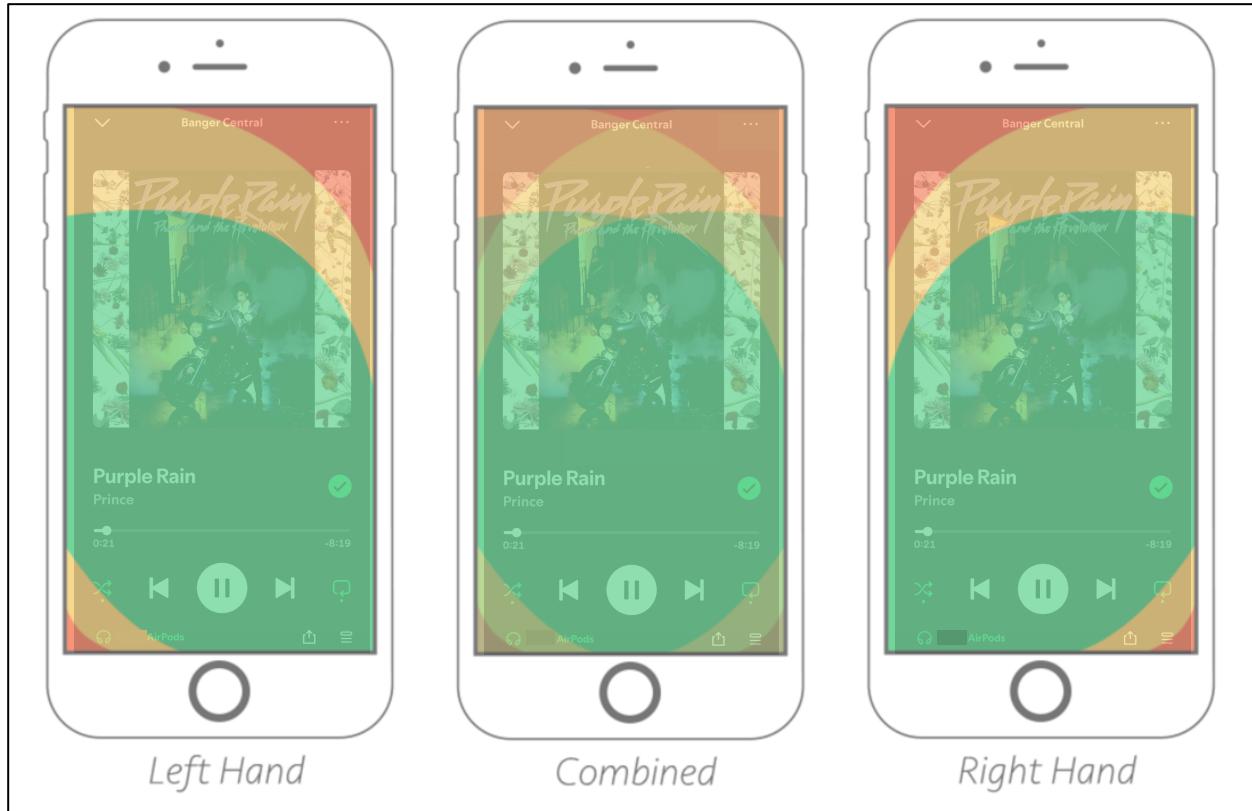
Reachability refers to the areas of a device which are most physically accessible. These areas are defined by the “Thumb Zone” (Ingram, 2016; see Figure 6).

*Figure 6: The Thumb Zone*



By overlaying the Spotify Interface, its reachability can be assessed. As shown in Figure 7, the most important features of the interface (e.g., pause), are accessible. However, reachability can be improved as some functions (e.g., the collapse arrow) are hard to reach and the album cover is covering a disproportionate amount of the “Natural” space.

*Figure 7: Spotify UI overlayed with The Thumb Zone*



## **Psychological Level**

Craik (1943) described mental models as beliefs and ideas that people hold of things in the world, which influence their interactions. In producing a music streaming app, it is vital to consider the wide range of mental models that users hold around music. For example, music is traditionally released in albums, but recent trends in the music industry have placed a higher emphasis on singles (Wilkes, 2021), and users' mental models of music playback differ likewise. The Spotify app caters to various mental models by giving users the ability to interact with music in a variety of formats including albums, singles, playlists and more.

## **Design Principles**

Norman (2013) proposed seven fundamental principles of design that represent effective interaction (see Table 1).

*Table 1: Norman's Seven Fundamental Principles of Design*

<b>Principle</b>	<b>Description</b>
Discoverability	The extent to which the possible actions and the current state of the device can be determined.
Affordances	The relationship between a physical device and the user. Specifically, the possible ways in which the user can interact with the object.
Signifiers	A perceivable indicator for how the user should interact with the device or interface.

Constraints	Physical, logical, semantic or cultural boundaries which guide action and assist interpretation.
Mapping	The relationship between the action undertaken by the user, and the corresponding result.
Feedback	The extent to which the results of an action are communicated with the user.
Conceptual Model	A simplified explanation of how a device works, existing psychologically and unique to the user.

Norman produced these principles as generic considerations for all types of interactive design which makes them freely applicable to the UI of Spotify. Figure 8 demonstrates some of these principles which are visible in the design of Spotify.

Figure 8: Investigation of Design Principles in Spotify

**Signifiers:** The use of figure-ground principles (Koffka, 1935) allows interactable items to stand out, showing how the user should interact with the interface.

**Discoverability:** The user can determine the current state of the interface from the currently playing window. Also represents **Feedback** when the user selects a new song.

**Conceptual Model:** The suggested audio represents a range of conceptual models as it offers a range of formats including playlists, artists and albums.

**Mapping:** The quick pause/play button enclosed within the same boundary as the song name and culturally associated as users read horizontally. Also makes use of the Gestalt principle of proximity (Koffka, 1935) which allows the user to know the items are related.

**Constraints:** The quantity of functions the user can activate on the currently playing window are limited to enhance simplicity.

## **Analysis of Usability**

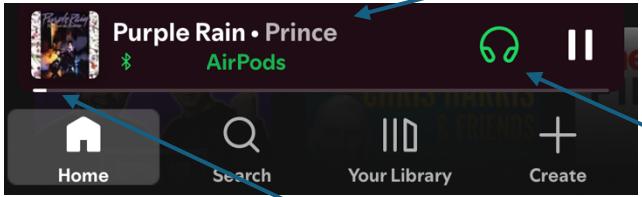
In the context of interface design, heuristics are general principles or rules-of-thumb which guide the design and evaluation of a UI to enhance the user experience. They are a cost-effective and efficient way of assessing the usability of an interface. However, it has been found that heuristic evaluations can lack predictive validity; Woolrych and Cockton (2000) examined the efficacy of heuristic evaluation and found many false positives, where experts had identified issues which the user themselves did not experience. This is one of the major limitations of heuristic evaluation; experts often overestimate or underestimate the capabilities of a typical user. Therefore, Benyon (2013) states that heuristic evaluation should be used as a formative assessment rather than a summative one. By offering heuristic insights alongside actionable recommendations, the present evaluation of the Spotify UI aligns with a formative approach aimed at guiding iterative design improvements. An alternative method of formative evaluation is cognitive walkthrough, where an expert completes a series of tasks on the interface and considers the extent to which the user would be able to follow the correct actions. However, cognitive walkthroughs are primarily focused on learnability rather than usability. Thus, for expert users like Olivia, heuristic evaluation is more appropriate than cognitive walkthrough for identifying potential usability issues. Nielsen (1994) developed a set of ten heuristics which can define the usability of an interactive interface. This heuristic framework is appropriate for evaluating Spotify because it encapsulates usability and error-prevention which are essential for a positive music-streaming experience where effortless and satisfying interactions are paramount. Mobile-specific heuristic sets exist (e.g., Da Costa et al. 2019), but they scarcely differ from Nielsen's heuristics. Furthermore, Nielsen's heuristics have been extensively validated, both for complex applications (e.g., Kaplan, 2021) and for Spotify (e.g., Kunz, 2023), which supports

their robustness and relevance. Thus, Nielsen's framework was selected for the present evaluation. Each heuristic is applied below, with issues rated by severity on a 3-point scale - where 1 indicates low severity and 3 indicates high severity - as recommended by Dumas and Fox (2012).

### ***1. Visibility of system status***

This states that users should be aware of what is happening in the system. Spotify provides visibility with their currently playing window (Figure 9), but there are limitations in the way this is implemented.

*Figure 9: Currently Playing*



The screenshot shows the Spotify mobile application interface. At the top, it displays the song "Purple Rain" by Prince. Below the song title, there is a small note indicating "AirPods". To the right of the song information are standard playback controls: a green headphones icon and a double-lined square icon for pausing. At the bottom of the screen, there is a navigation bar with four items: "Home" (represented by a house icon), "Search" (represented by a magnifying glass icon), "Your Library" (represented by a person icon), and "Create" (represented by a plus sign icon). A blue arrow points from the text "The status of the interface is always visible as the user can see what is playing and on which device." to the song title area. Another blue arrow points from the text "This bar moves along so the user knows roughly how long remains of the song, but there is no number to show exactly how long remains of the song. (Severity 1)" to the progress bar at the bottom of the screen. A red box surrounds the text about the progress bar, and a green box surrounds the text about the interface status.

+ The status of the interface is always visible as the user can see what is playing and on which device.

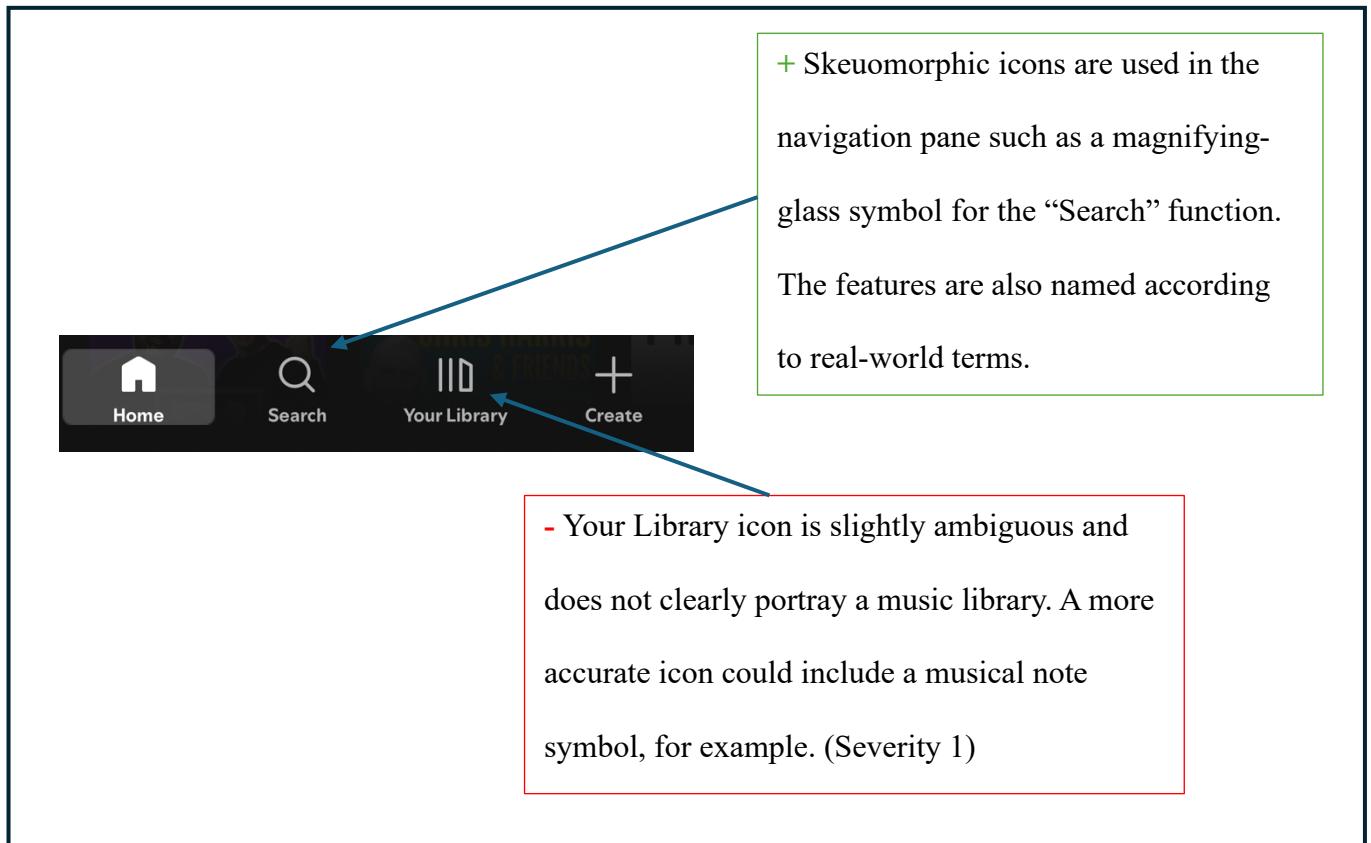
- This bar moves along so the user knows roughly how long remains of the song, but there is no number to show exactly how long remains of the song. (Severity 1)

- Device connection on iOS typically occurs automatically, so this is a rarely used function which could be replaced. (Severity 1)

## 2. Match between the system and the real world

This refers to using language and icons which the user is already familiar with, often by following real-world conventions. Skeuomorphism (e.g., Norman, 2013), is a principle whereby digital objects are designed to resemble real-world equivalents. Skeuomorphs are utilised in Spotify, but some lack clarity (Figure 10).

Figure 10: Skeuomorphic Design in Spotify



### 3. User control and freedom

According to Nielsen, if users make a mistake, they should not have to go through an extended rectification process. Spotify has addressed this principle in some ways (Figure 11) but sometimes fails to provide sufficient warning (Figure 12).

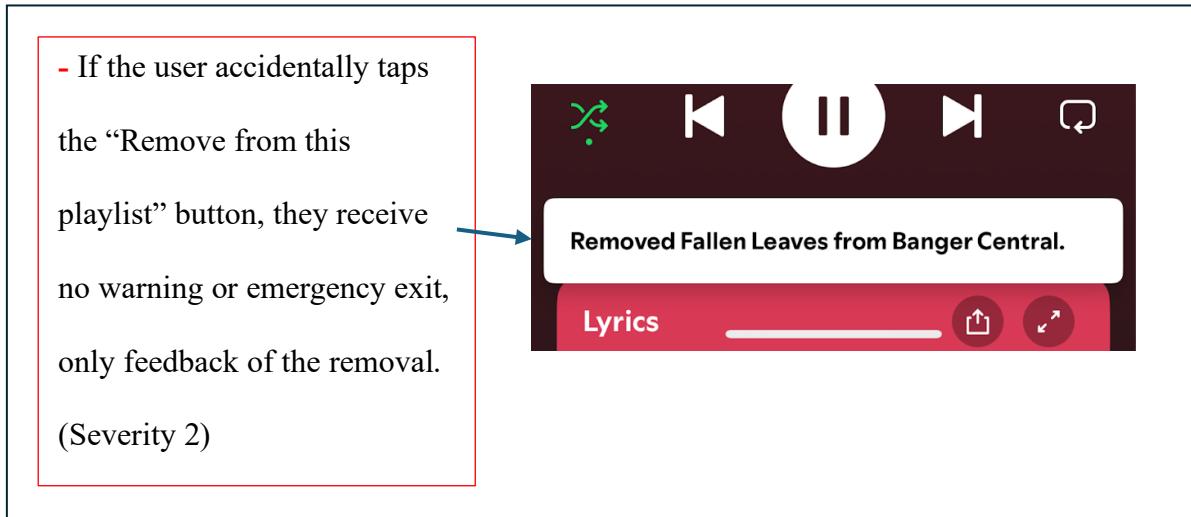
Figure 11: Playlist Checklist

+ If the user accidentally taps “Add to playlist”, Spotify provides a clearly identifiable “cancel” button.

The screenshot shows the 'Add to playlist' screen. At the top, there's a 'Cancel' button and a 'Done' button at the bottom. In the center, there's a 'New playlist' button. Below it is a search bar labeled 'Find playlist' with a 'Clear all' button. A 'Saved in' section lists 'Liked Songs' with a checked checkbox. Below that are two playlists: 'Vol 1: What Did You Expect From This Playlist?' and 'Welcome To The Playlist', both with checked checkboxes. Underneath these are sections for 'Recently added' (Drive, 10 songs) and 'Dream Setlists' (5 playlists). A green 'Done' button is at the bottom right.

- The user can uncheck a playlist if they select the wrong one, but if they want to add the same song to a playlist twice, there is no clear way of doing this. In this way, the checklist design somewhat obstructs the freedom of the user.  
(Severity 1)

Figure 12: Message the user sees after removal from playlist



#### 4. Consistency and standards

This heuristic states that users should be confident that the language and icons used in an interface are consistent with industry standards. Spotify achieves this in the now playing window (Figure 13) but is inconsistent with iOS standards in other contexts (Figure 14).

Figure 13: Industry-standard iconography in Spotify

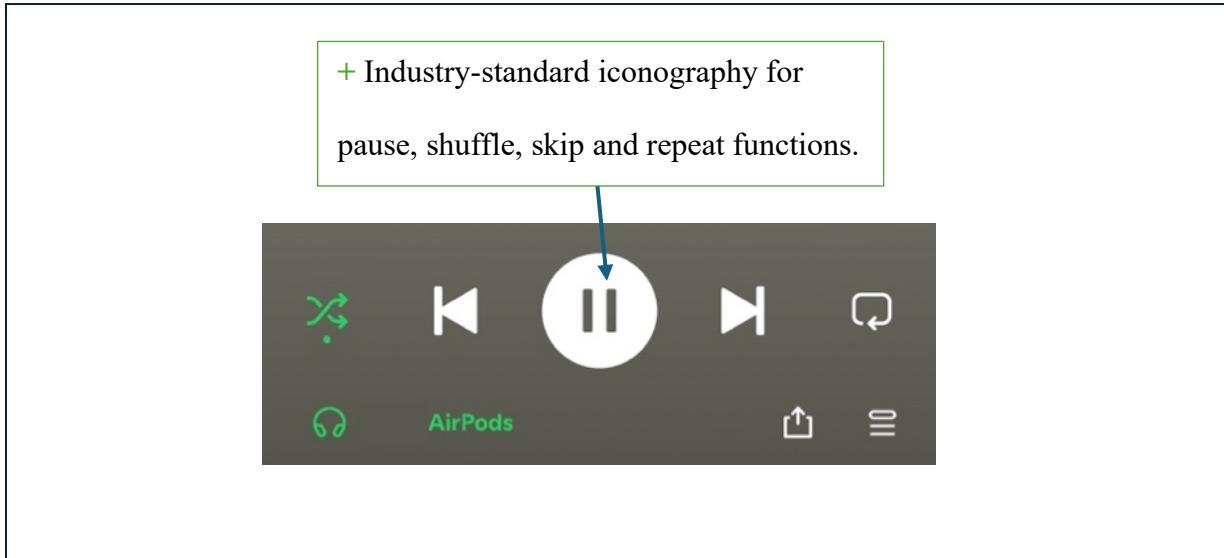
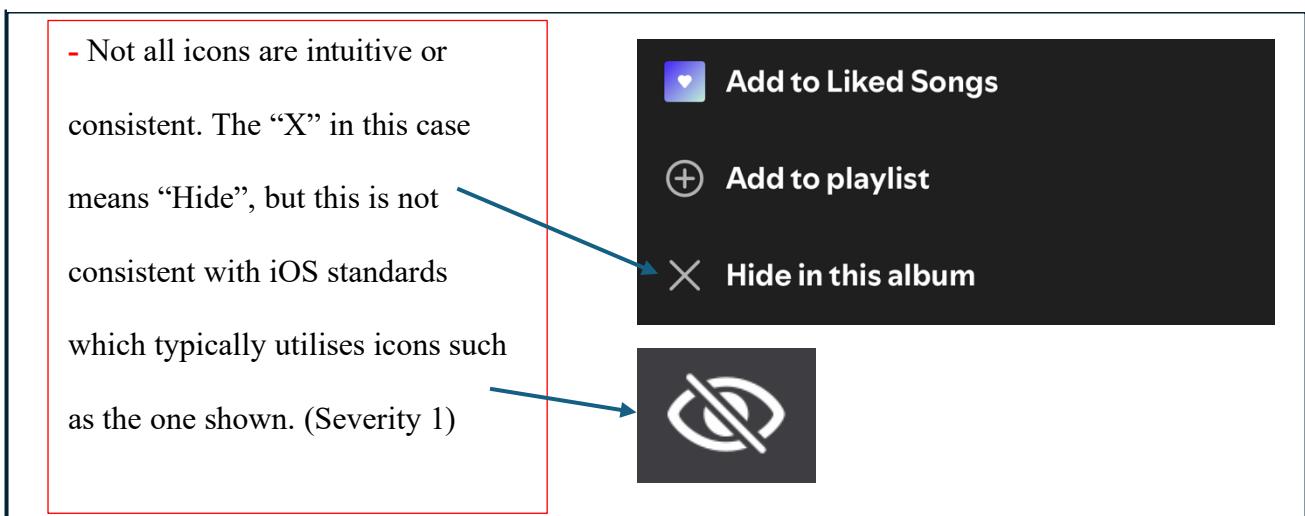


Figure 14: Inconsistent Icons in Spotify



## 5. Error prevention

Nielsen states that good designs prevent the user from making mistakes. Spotify does not achieve this principle sufficiently, with confusable icons which lack distinction (see Figures 15 and 16).

Figure 15: Add and Remove from Playlist

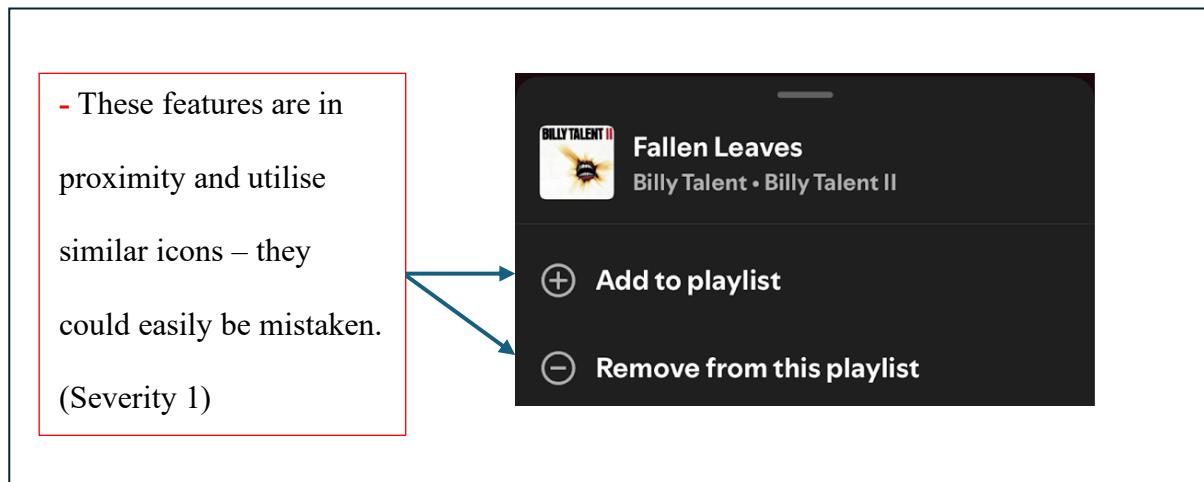
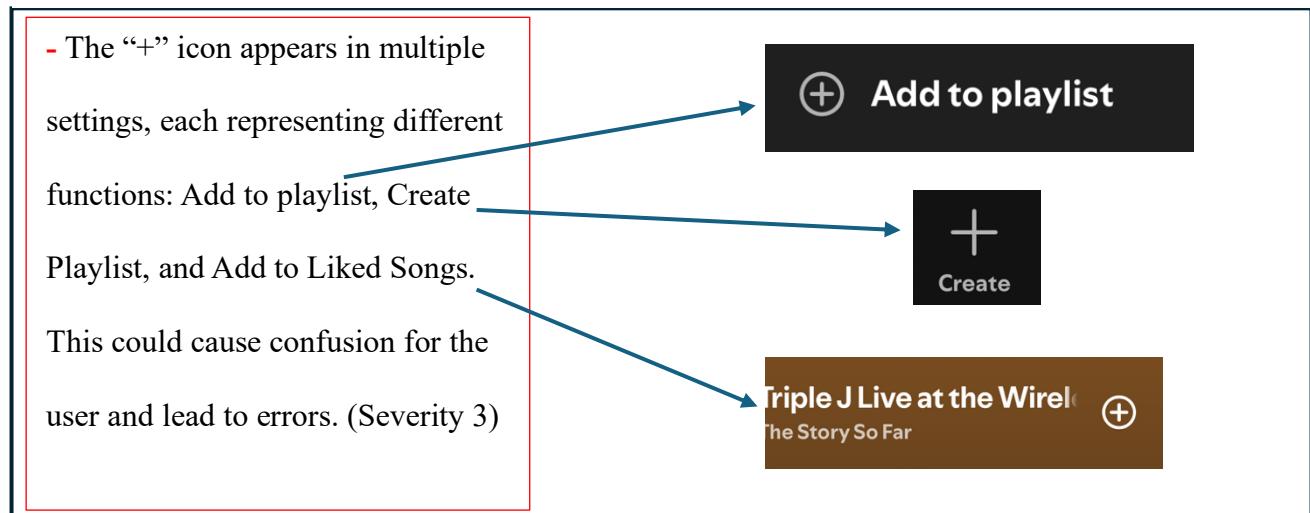


Figure 16: Confusing Icons in Spotify



## 6. Recognition rather than recall

The user's memory load should be minimised by making actions easily visible. Spotify is largely efficient in providing suggestions which allow the user to rely on recognition rather than recall (see Figures 17, 18 and 19). However, in some contexts Spotify provides the user with excessive options which reduce the ease of recognition (Figure 20).

Figure 17: Recent Searches

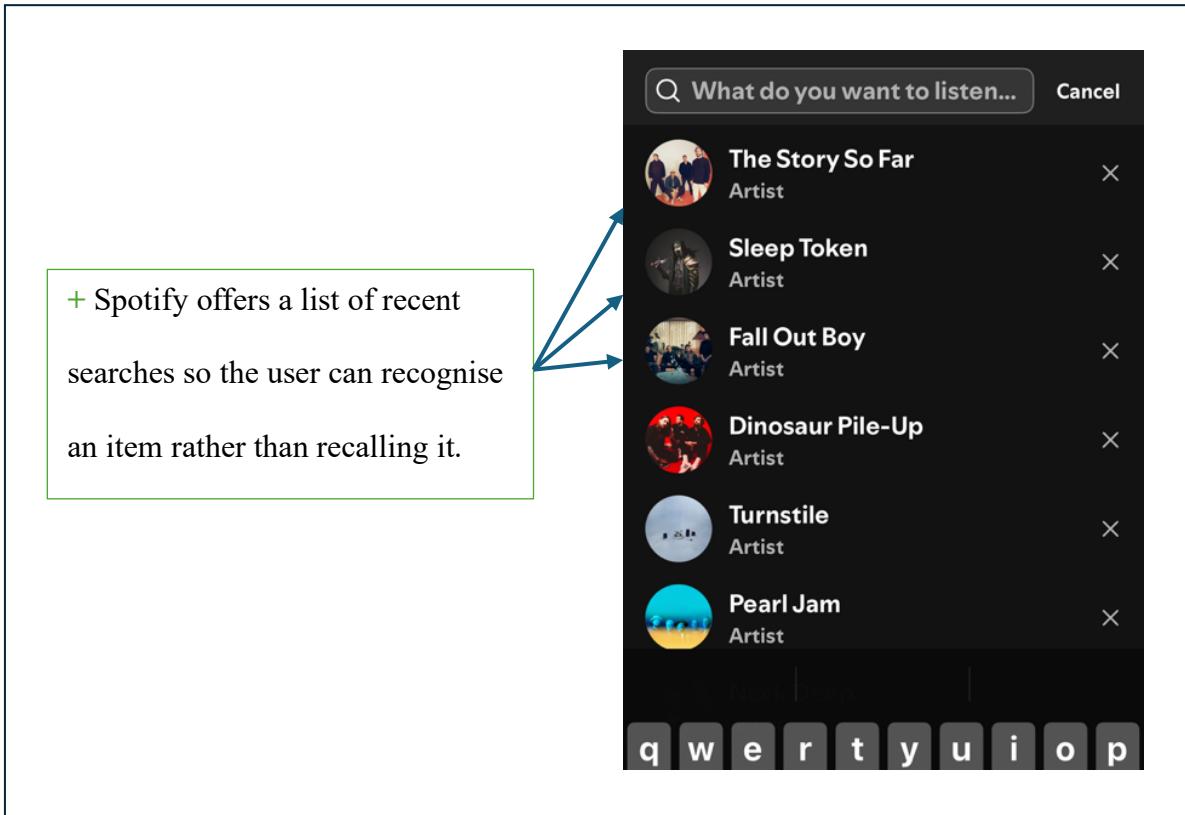


Figure 18: Suggestions as the user types

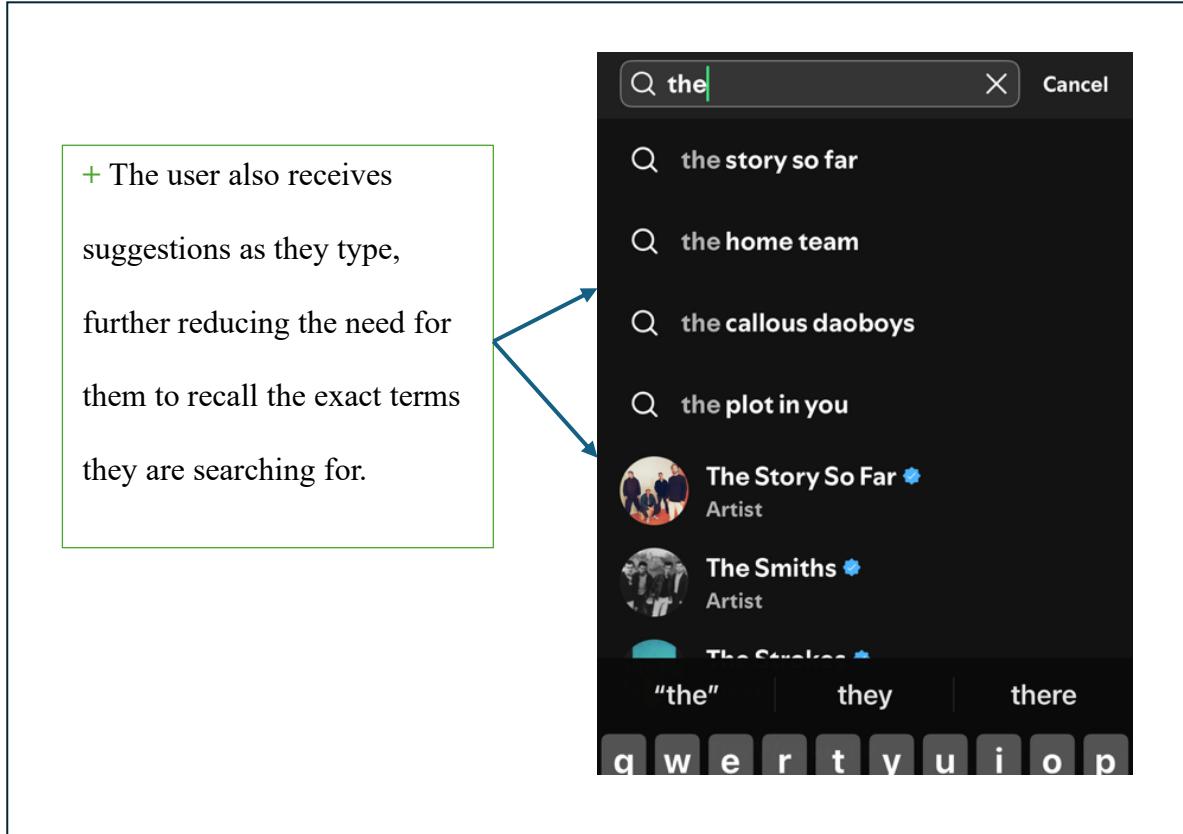


Figure 19: Action List

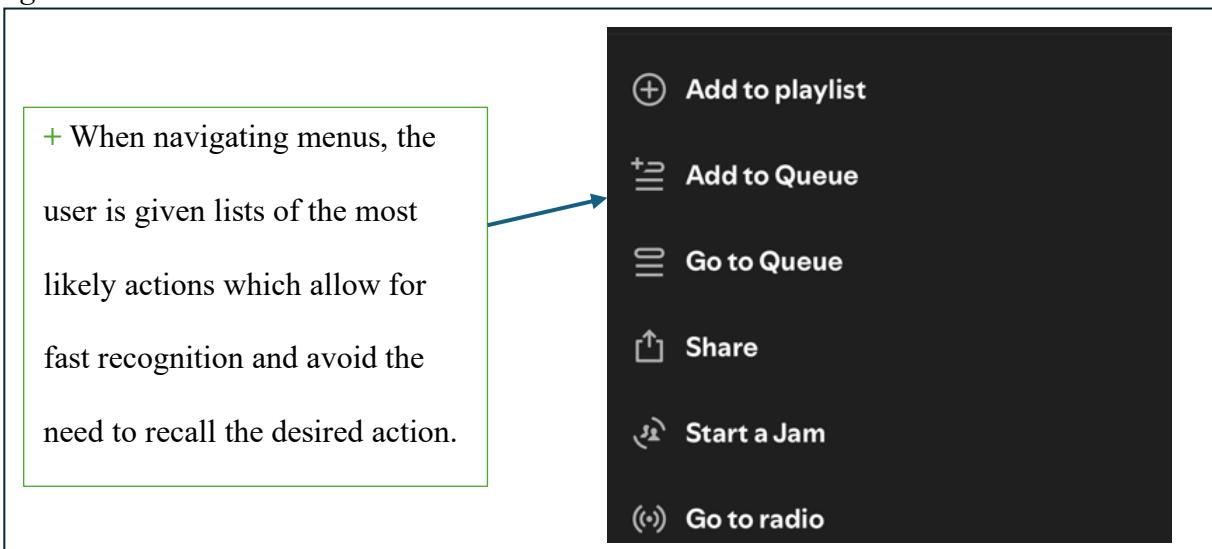
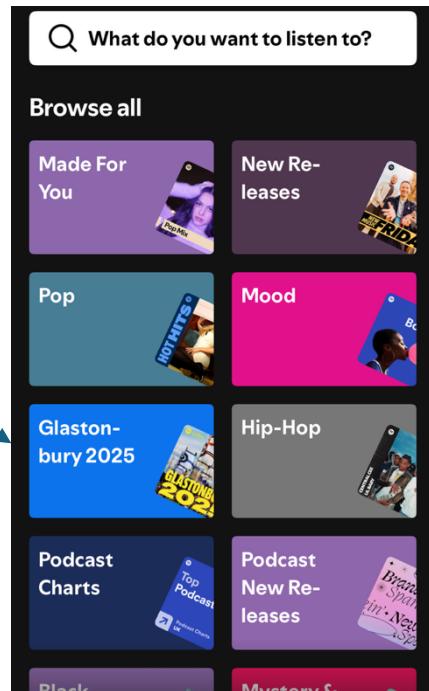


Figure 20: Inefficient Layout of Categories

- When browsing the categories in the search page, there are dozens available and no way to customise their appearance (reduced flexibility). The user will likely need to search for (recall) a category as there are too many items for recognition. (Severity 2)



## 7. Flexibility and efficiency of use

The interface should cater to both novice and expert users by providing shortcuts which enhance efficiency. There are some shortcuts available to expert users, such swiping-right on a song title to add to queue. However, the Spotify application lacks flexibility for expert users in the “Your Library” window (Figure 21).

Figure 21: Your Library window in Spotify

- The default sorting method is by most recent, which causes the order of items to change every time. For expert users like Olivia, this makes some playlists difficult to locate, as she may not remember how recently she listened to them, and even if she chooses an alternative sorting method this is not saved when she returns to the app.

(Severity 1)

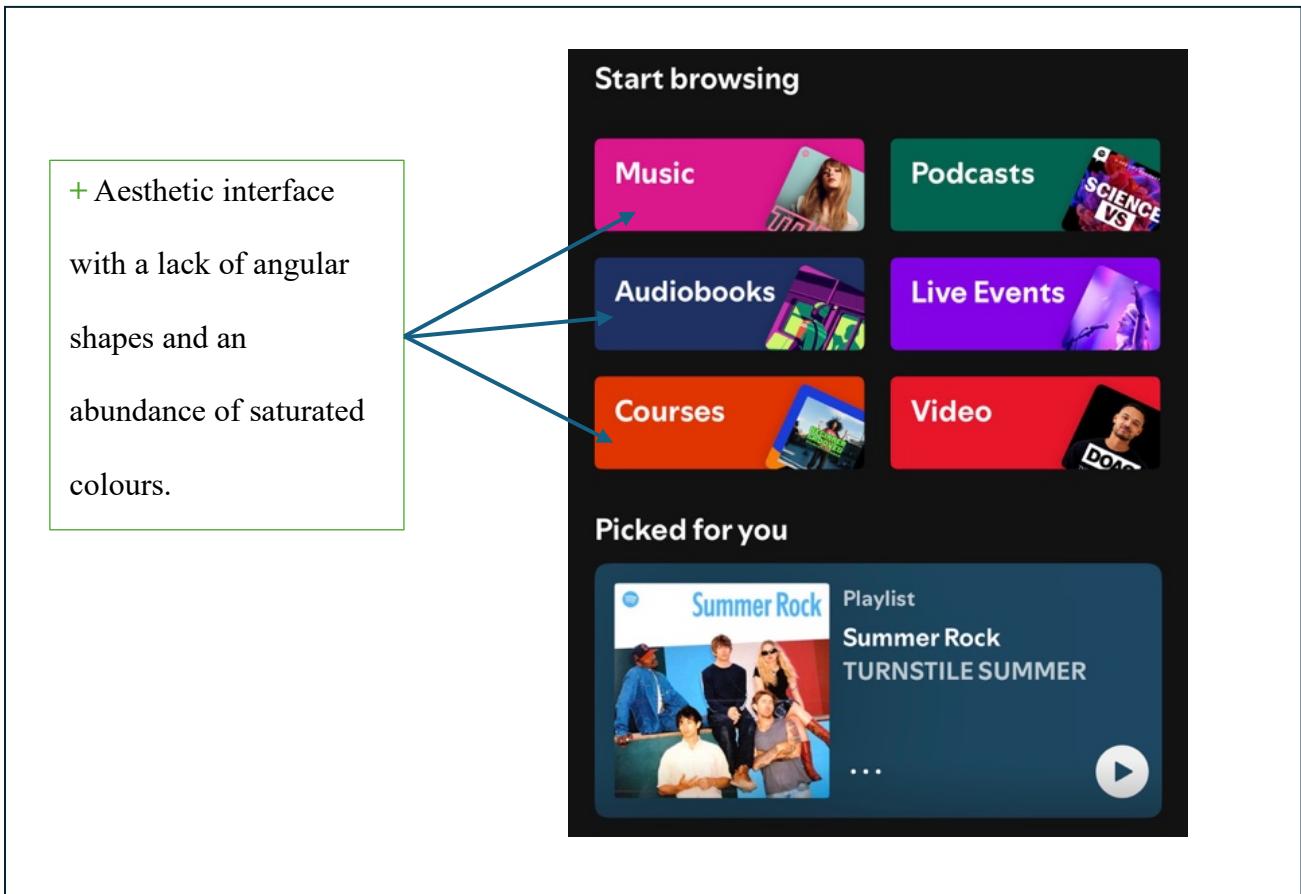
The screenshot shows the Spotify 'Your Library' interface. At the top, there are tabs for 'Playlists', 'Podcasts and courses', and 'Audiobooks'. Below the tabs, a section titled 'Recents' is shown with a sorting option '↓↑ Recents'. The main content area displays several items:

- Mains** (18 playlists): Represented by a folder icon.
- P1 with Matt and Tommy** (Podcast • Stak): Represented by a purple thumbnail with two hosts and a 'P1' logo.
- New Episodes** (Updated yesterday): Represented by a purple thumbnail with a green bell icon.
- The Car Podcast with Chris Har...** (Podcast • Chris Harris): Represented by a thumbnail featuring three men.
- Gigs** (6 playlists): Represented by a folder icon.

## 8. Aesthetic and minimalist design

According to Lee (2018), some of the components that make a design “aesthetic” are rounded shapes and vibrancy of colour. Spotify has long been focused on aesthetics and the application achieves this, as shown in Figure 22.

Figure 22: Spotify Aesthetics



However, Spotify lacks minimalist design. In *The Design of Everyday Things*, Norman (2013) describes “featuritis” as the process in which an interface collects progressively more features to enhance functionality, but in-turn overcomplicates the once-simple design. Spotify is falling victim to this phenomenon, as demonstrated by Figures 23 and 24.

Figure 23: Number of Features in Spotify UI in 2014

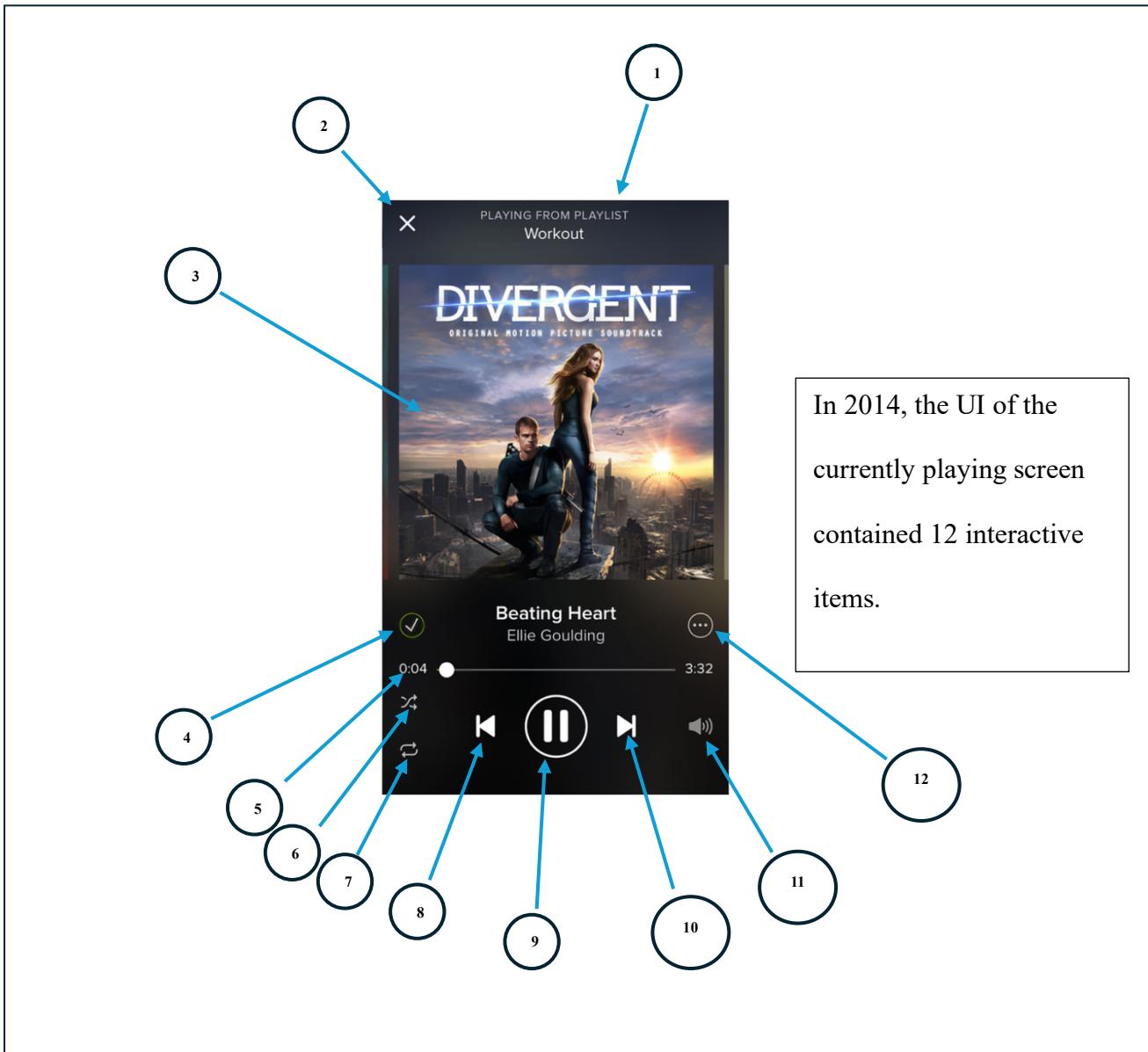
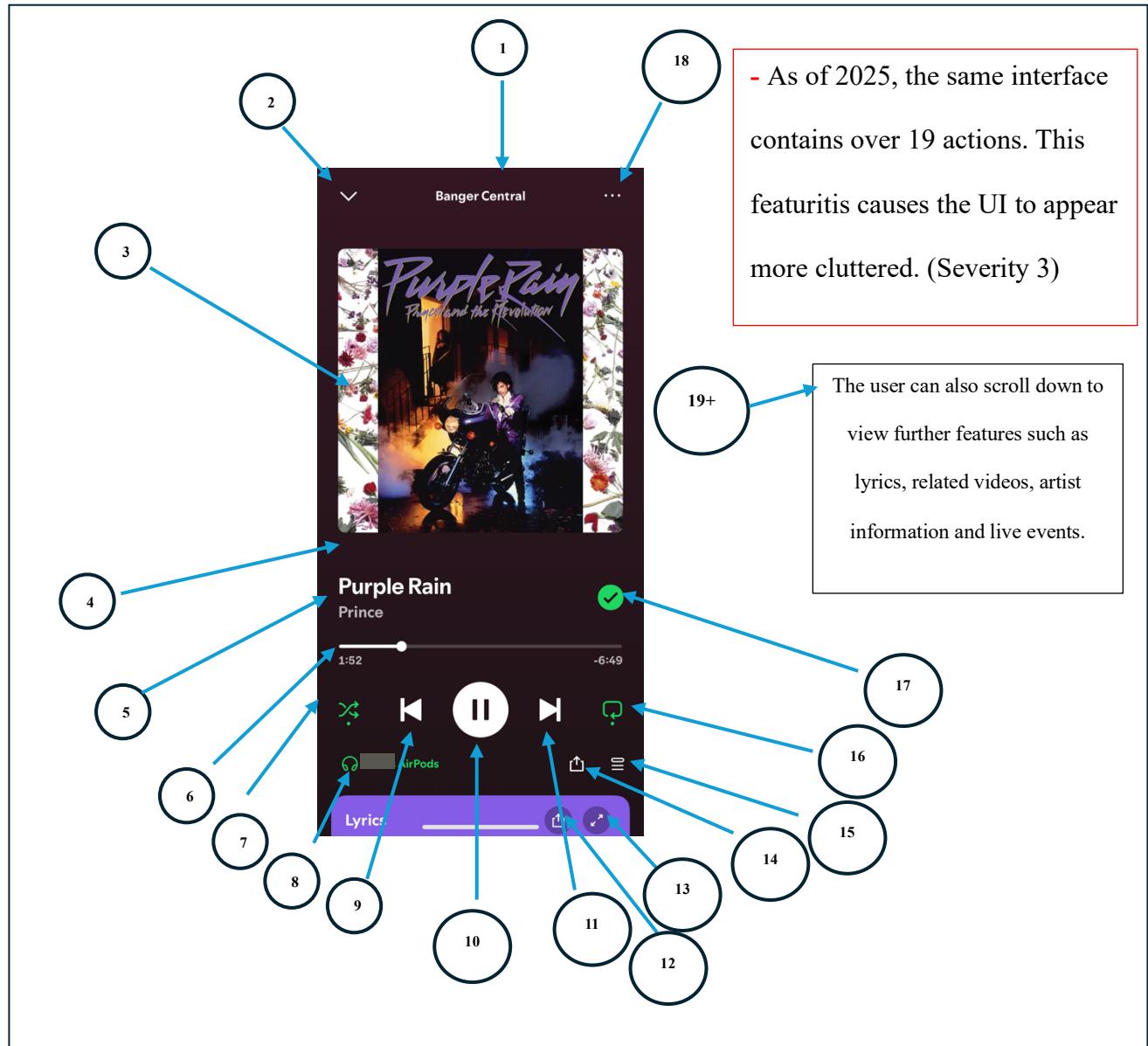


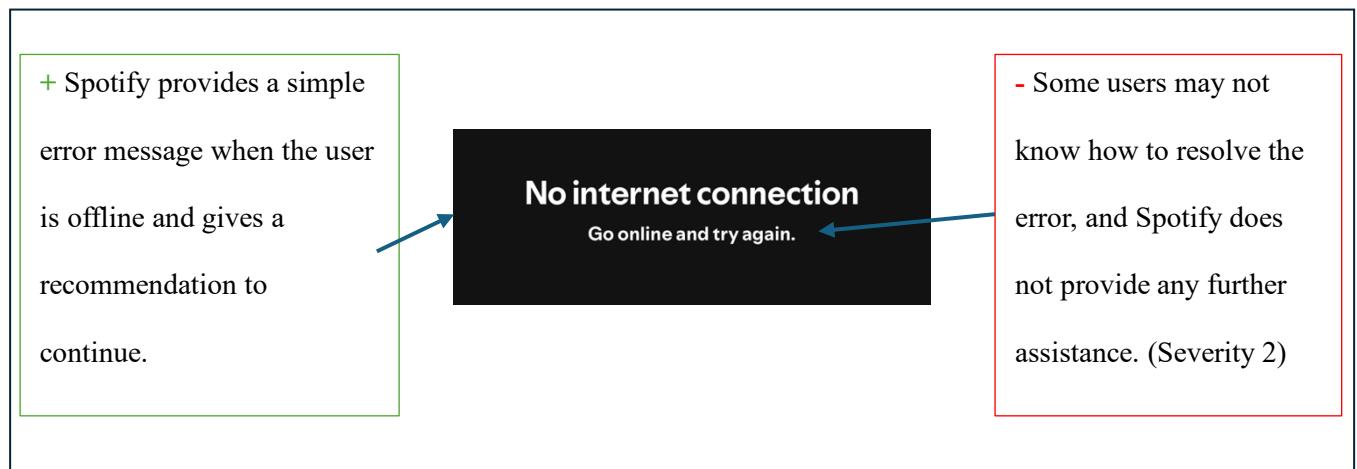
Figure 24: Number of Features in Spotify UI in 2025



## **9. Help users recognise, diagnose and recover from errors**

If the user encounters an error, there should be sufficient diagnostic advice available. For expert users like Olivia this is not essential, but novice users might struggle in some cases (see Figure 25).

*Figure 25: Spotify Offline Error Message*



## **10. Help and documentation**

- There is no obvious help documentation on the Spotify application. Users who need support would need to use the Spotify webpage and this is not clearly signposted (Severity 3).

## **Recommendations for Improvement**

Table 1 summarises the recommendations for improving the Spotify interface, the principle or heuristic the recommendation is based on, the impact this will have on usability, and the corresponding illustration of implementation.

*Table 2: Recommendations for Improvement*

Principle or Heuristic	Recommendation	Impact	Figure(s) Demonstrating Change (if applicable)
Physical Level	Bring functions near the top of the screen closer to the natural thumb zone.	Improves reachability and maximises the physical accessibility of the interface.	26
1. Visibility of System Status	Add time remaining to the now playing mini window.	Enhances the visibility of the system status.	27
2. Match between system and real-world	Use an improved icon for Your Library.	Improves the extent to which it matches with the real world.	27
3. User Control and Freedom	Adjust the “checklist” method of adding songs to +/- icons with feedback showing the user how many of the song are in the playlist.	Allows the user to duplicate the song if they wish – enhancing control and freedom.	28 and 29
	Provide a warning to the user when they select the “Remove from playlist” option.	Provides the user with an emergency exit in case they make a mistake, enhancing their control over the system.	N/A

<b>Principle or Heuristic</b>	<b>Recommendation</b>	<b>Impact</b>	<b>Figure(s) Demonstrating Change (if applicable)</b>
4. Consistency and Standards	Use intuitive icons which match with iOS. For example, the “hide” icon should match iOS standards as the current “X” is unintuitive.	Improves the consistency of icons so they are more identifiable.	N/A
5. Error Prevention	Adapt symbols to ensure they are sufficiently distinctive and identifiable.	Reduces the likelihood of the user making an error, such as removing a song which they intended to add.	26
6. Recognition rather than recall	Categories are grouped, with customisable categories based on the user’s listening habits appearing at the top of the page.	User can immediately recognise relevant categories and can also identify less relevant categories by their groups.	29
7. Flexibility and Efficiency of Use	Remember the user’s library and search preferences. For example, keep custom order sorting if the user selected this option previously.	Maximises the efficiency of use for users who prefer not to use the default methods, allowing them to access their items with ease.	29
8. Aesthetic and Minimalist Design	Reduce the quantity of features on the interface.	Promotes a minimalist design that is focused on ease-of-use.	26
9. Help users recognise, diagnose, and recover from errors.	Improve the error messages by providing users with more detailed rectification instructions.	This allows users, particularly those who are not experts, to understand how they can recover from the error.	30

<b>Principle or Heuristic</b>	<b>Recommendation</b>	<b>Impact</b>	<b>Figure(s) Demonstrating Change (if applicable)</b>
10. Help and Documentation	Provide clear “help” buttons on the interface, represented by a “?” icon, which provides the user with assistance or documentation.	The “?” symbol is an industry standard that represents assistance, but Spotify users currently have no clear way of accessing help or documentation on the app.	26

Where recommendations are demonstrable, they have been illustrated in the figures below for clarity.

Figure 26: Illustration of Improvements in the Extended Now Playing Window

The screenshot shows the Banger Central app interface. At the top is a large album cover for 'Purple Rain' by Prince. Below it is a track summary: 'Purple Rain' by Prince, with a play time of 1:52 and a total duration of 6:49. The main control area features a large play/pause button with a double arrow icon. To its left is a green 'AirPods' icon, and to its right are icons for volume, shuffle, and repeat. At the bottom are additional controls: a collapse arrow pointing down, a 'More' button with three dots, and a share icon. A red question mark icon is located in the top right corner of the album cover area.

**Help and Documentation:** symbol incorporated for novice users who require assistance. Located in top corner where the user is unlikely to tap erroneously.

**Error Prevention:** Add to liked songs replaced with intuitive heart symbol, different from the Add to Playlist symbol which retains the + symbol.

**Minimalism:** Convoluted lyrics function replaced by a single button that brings up the lyrics. The ability to scroll down is removed, limiting the total number of actions to 18.

**Physical Level:** Track options moved to the bottom of the screen to improve reachability, share function moved here for minimalism.

**Physical Level:** Collapse arrow moved to bottom to improve reachability.

Figure 27: Illustration of Improvements in the Collapsed Now Playing Window

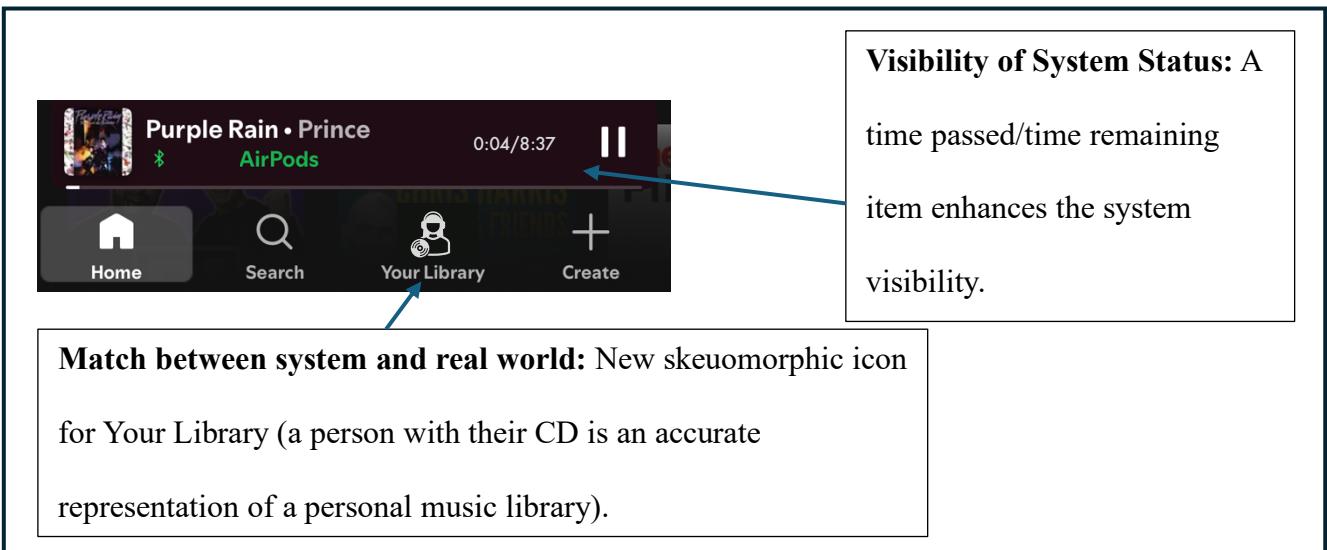


Figure 28: Illustration of Improvements in the Add To Playlist Window

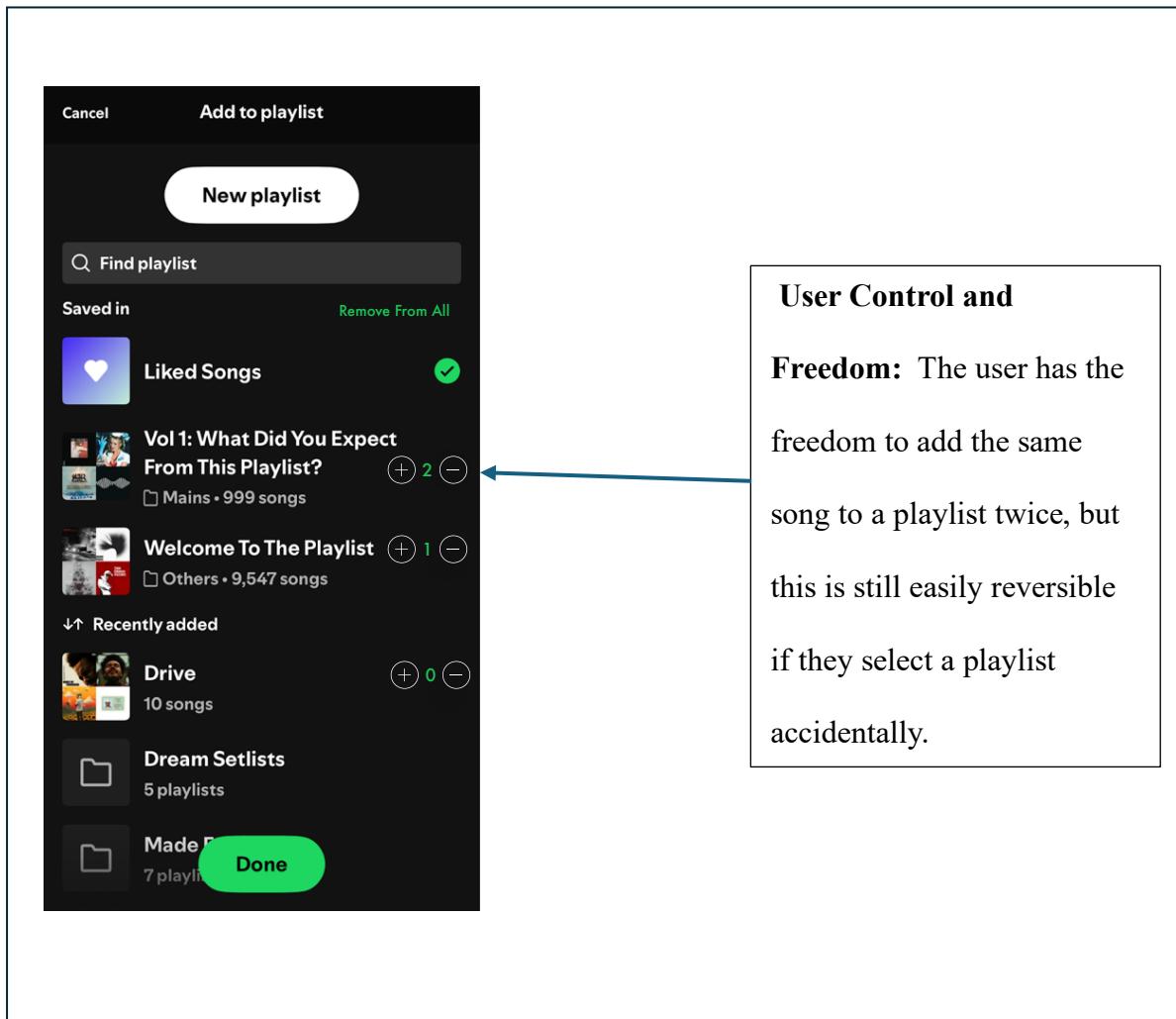


Figure 29: Illustration of Improvements in Search Window

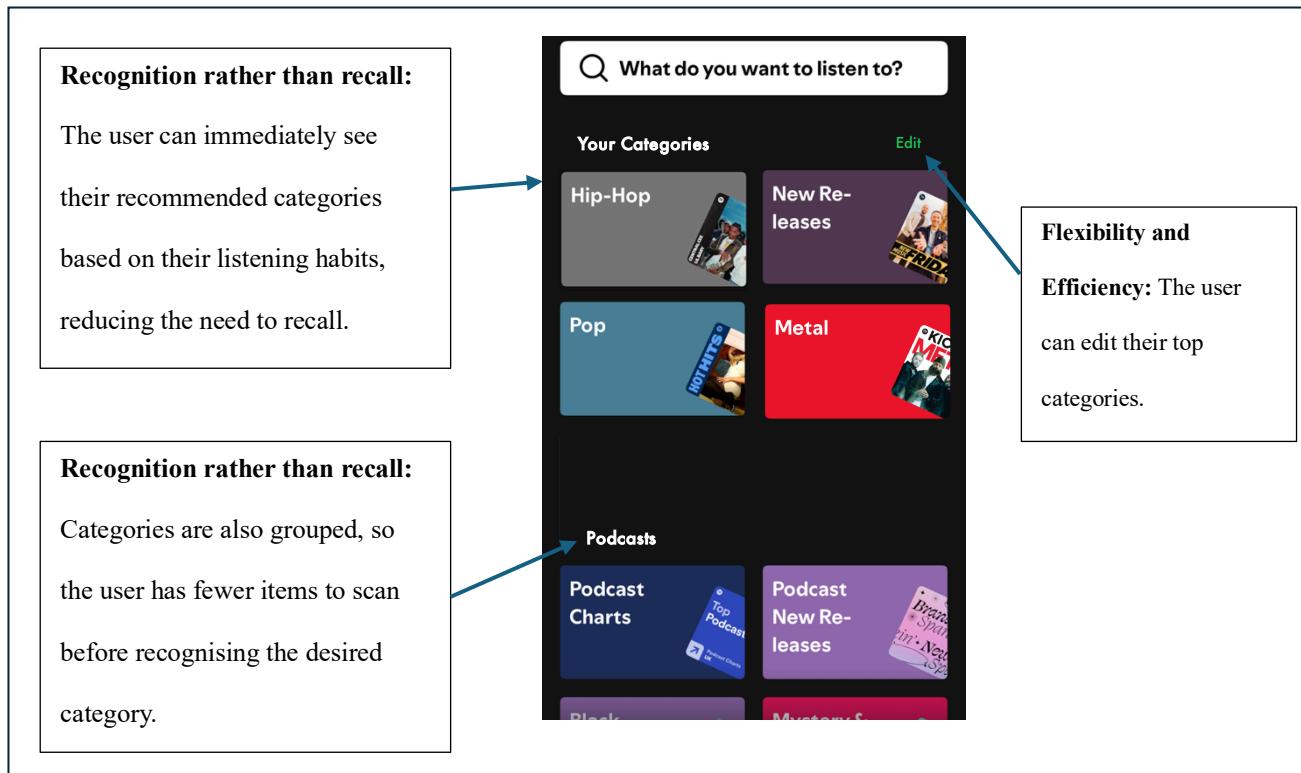
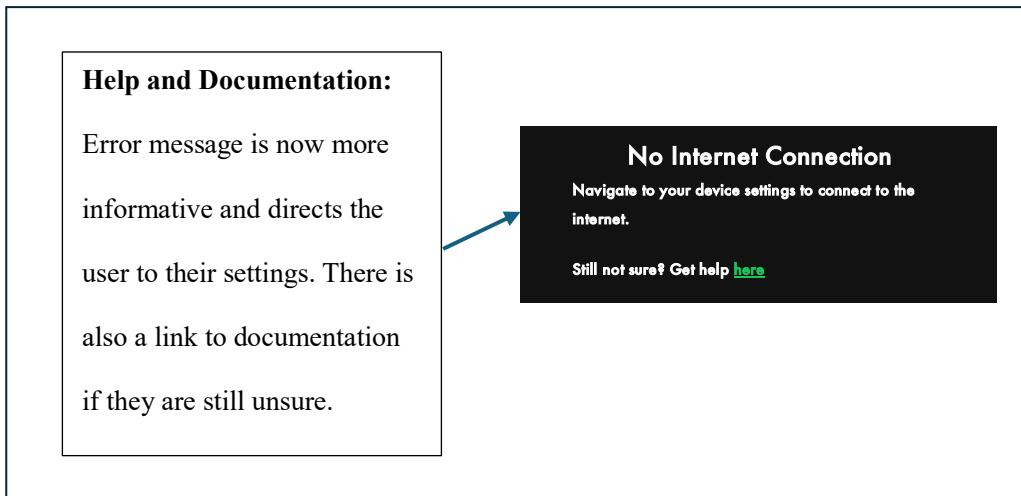


Figure 30: Illustration of Improvements to Help and Documentation



## **References**

- Benyon, D. (2013) Designing Interactive Systems PDF ETextbook : A Comprehensive Guide to HCI, UX and Interaction Design, Pearson Education, Limited, 2013. ProQuest Ebook Central, <http://ebookcentral.proquest.com/lib/sheffield/detail.action?docID=5173906>.
- Craik, K. J. W. (1952). The nature of explanation (Vol. 445). CUP Archive.
- Da Costa, R. P., Canedo, E. D., De Sousa, R. T., Albuquerque, R. D. O., & Villalba, L. J. G. (2019). Set of usability heuristics for quality assessment of mobile applications on smartphones. Ieee Access, 7, 116145-116161.
- Dumas, J. and Fox, J. (2012) Usability testing. In Jacko, J.A. (ed.), The Human— Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications (3rd edn). CRC Press, Taylor and Francis, Boca Raton, FL, pp. 1221– 1242.
- Harrison, R., Flood, D. & Duce, D. (2013). Usability of mobile applications: literature review and rationale for a new usability model. J Interact Sci 1, 1. <https://doi.org/10.1186/2194-0827-1-1>
- Ingram, S. (2016). The Thumb Zone: Designing For Mobile Users. [online] Smashing Magazine. Available at: <https://www.smashingmagazine.com/2016/09/the-thumb-zone-designing-for-mobile-users/>.
- Kaplan, K. (2021). 10 Usability Heuristics Applied to Complex Applications. Nielsen Group. <https://www.nngroup.com/articles/usability-heuristics-complex-applications/>
- Koffka, K. (1935). *Principles of Gestalt psychology*. Harcourt, Brace.

Kunz, S. (2023). Heuristic Evaluation of Spotify. Medium.  
<https://medium.com/@sydkunz/heuristic-evaluation-of-spotify-1afd53f2834b> [Accessed 21st May 2025)

Lee, I. F. (2018). Joyful: The surprising power of ordinary things to create extraordinary happiness. Penguin Random House.

Nielsen, J. (1994). 10 Heuristics for User Interface Design. [online] Nielsen Norman Group.  
Available at: <https://www.nngroup.com/articles/ten-usability-heuristics/>. [Accessed 8<sup>th</sup> May 2025]

Wilkes, E. (2021). The Boar. [online] Available at: <https://theboar.org/2021/02/are-singles-killing-the-album/>.

Woolrych, A. and Cockton, G. (2000) Assessing heuristic evaluation: mind the quality, not just percentages. In Turner, S. and Turner, P. (eds), Proceedings of British HCI Group HCI 2000 Conference, Sunderland, UK, 5– 8 September. British Computer Society, London, vol. 2, pp. 35– 36.

*Note: All icons used for adaptations of the User Interface were taken from Microsoft Word, unless otherwise stated.*