A Comparative Study of Micro-interactions in Music Streaming Apps: Spotify vs. NetEase Music

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Degree Programme in Business Information Technology
Bachelor's Thesis
2025

Abstract

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Degree
Bachelor of Business Administration, Business Information Technology

Thesis Title
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Number of pages and appendix pages
44 + 15

This research, conducted between February and May 2025, took Spotify and NetEase Music——two dominant music streaming platforms representing respectively the global market and China's domestic market——as the research objects, exploring their differences in micro-interaction design, and how these differences reflect the platforms' cultural adaptability to user expectations across distinct cultural contexts.

The study is structured based on Dan Saffer's micro-interaction theory, selecting eight representative tasks, and analyzing the interfaces through four dimensions: Trigger, Rules, Feedback, and Loops & Modes. User experience feedback was then collected through task-based user testing and semi-structured interviews. Finally, the findings were interpreted through Hofstede's cultural dimensions theory and Hall's high- and low-context communication theory, in order to explain and contrast the cultural adaptation factors behind the design differences.

The results show that the two apps exhibit distinct differences in information delivery, feedback mechanism, and social interaction. These differences reflect their adaptation strategies to their respective target cultures:

Spotify targets users from low-context, individualistic cultures, represented by Western. Its micro-interaction design prioritizes clarity of information, simplicity feedback, and a small-scale in social interaction, emphasizing a smooth experience with minimal intervention, aligning with cultural preferences for efficiency, directness, and individual pacing.

In contrast, NetEase Music serves users from high-context, collectivism Eastern cultures. Its design places greater emphasis on visual appeal, emotional engagement, and community interaction. Its interface provides abundant guidance, subtle hints, and layered feedback, allowing users to naturally integrate into the relational network and emotional context constructed by the platform.

This difference not only shows the products' awareness and response to cultural characteristics but also reveals the critical role of micro interactions as a vehicle for cultural adaptation.

This study demonstrates that micro-interaction is not only a means to enhance user experience, but also a reflection of cultural values. By analyzing how micro-interaction adapts to users' behavioral patterns across different cultural contexts, this thesis offers practical strategies for cross-cultural digital product design.

Key words
Micro-interaction, Cultural adaptability, Music Streaming App, Spotify, NetEase music, UI/UX

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1 Introduction

In recent years, music streaming services have become an integral part of daily life, especially popular among younger audiences. As competition in this field intensifies, user experience (UX) has gradually become a key factor for platforms to differentiate themselves. Among all the factors influencing UX, user interface (UI) design—particularly micro-interactions—plays a central role in shaping users' perception of and emotional connection with a product (Saffer 2013, 7-8).

"Micro-interactions" refer to small, frequently performed actions by users within the interface (Saffer 2013, 6). In music apps, these are manifested in functions like play/pause, liking a song, or receiving personalized recommendations. It not only involves to the triggering of a feature but also encompasses the system-provided feedback after the trigger. For example, when we click a button to add a song to favorites, the system then displays a notification stating that the song has been added to the "Liked Songs" playlist. This entire process can be referred to as a micro-interaction. While general UI design is often discussed, micro-interactions are still a relatively new topic. These interactions may seem minor, they also convey product identity through visual feedback, operational flow, and emotional communication. Therefore, micro-interactions offer a unique lens for observing the topic I was going to discuss next.

This study selects two music streaming services developed under different cultural contexts: Spotify and NetEase Music.

Spotify is the world's largest and most representative music streaming platform, with a broad global influence. As of Q4 2023, Spotify held approximately 31.7% of the largest global music streaming market share, with 236 million paid subscribers and over 615 million monthly active users (Duarte 2025).

Meanwhile, NetEase Music has a unique position in the Chinese market, particularly excelling in social and emotional design, attracting a large base of young users (over 60% from Gen Z). According to the data (Su March 2025), NetEase holds approximately 20% market share in China, and made up 6.7% of global market share. As of June 2023, its paid subscriber count reached 42 million, with 206 million monthly active users (Duarte 2025).

As shown above, Spotify and NetEase Music have demonstrated strong growth momentum and user retention in the global and Chinese domestic markets respectively. Both platforms continuously iterate on the product level, striving for optimal user experience, while also actively embracing sustainable development principles at the corporate level. For instance, Spotify (2024) launched the "Climate Action" initiative, aiming to reduce the carbon footprint of the music industry.

Meanwhile, NetEase Music's parent company has incorporated green technology and social responsibility into its corporate development strategy (NetEase 2023). These efforts not only reflect the platforms' awareness of social and environmental issues, but also indirectly demonstrate their emphasis on long-term value and user trust. However, despite targeting vastly different markets, both products appear to have implemented a success strategy. According to Spotify data (IFPI 2024), Spotify present in over 185 market, adopts a light localization strategy under a global framework, while NetEase Music, representing Chinese-style innovation, implements a deep localization strategy.

This raises a thought-provoking question: Could the differences in their interface and interaction design be a direct response to their respective cultural environments? As a key touchpoint between users and systems, can micro-interactions serve as a meaningful entry point for understanding cultural adaptation?

This study is based on such an observation, aiming to explore how cultural context shapes user experience through an in-depth comparison of Spotify and NetEase Music's micro-interaction designs, in order to provide empirical evidence and strategic insights for cross-cultural product design.

1.1 Research Objectives and Questions

This study aims to explore the adaptability of micro-interaction designs to user needs in a multicultural context through a comparative analysis of two representative music streaming services, Spotify and NetEase Music. By combining interface analysis, user testing/interviews, and cultural theory, this study seeks to reveal how these platforms use micro-interactions to respond to users' differing expectations regarding usage experience, emotional expression, and interaction preferences across cultural backgrounds, thus offering insights on cultural adaptability in UI/UX design for both global and local markets.

The core Research Questions including:

RQ1: What are the main differences in micro-interaction design between Spotify and NetEase Music?

RQ2: How do these design differences reflect adaptability to culturally distinct user needs?

1.2 Scope and Justification

This study is limited to the iOS versions of Spotify and NetEase Music, focusing specifically on their micro-interaction design rather than overall UI layout. The analysis is confined to the mobile

app experience on iOS smartphones, excluding both Android and desktop/web-based platforms. There are four main reasons for this scope limitation:

First, mobile apps are the primary mode of interaction for most users in music streaming services, especially among younger demographics. This makes the mobile client more representative of users' real usage contexts.

Second, for research feasibility, the researcher is an iOS user, allowing easier access to interface details and smoother testing and documentation.

Third, both apps exhibit cross-platform design consistency, with only minimal differences in micro-interactions between iOS and Android, making system-level comparisons unnecessary.

Fourth, from a user demographic perspective, iOS holds a higher adoption rate among young users, which better aligns with the target audience of this study.

Additionally, this study does not involve usability comparisons**.** According to Nielsen and Norman (August 1998), usability is a metric for evaluating UI quality. The concept of usability applies to all aspects of systems that people might interact with. It is generally used to assess whether a product is "user-friendly," which means whether users can effectively make use of the product's features (Nielsen 1993, 16). However, the core purpose of this research is not to determine which app is more user-friendly or which design better fits usability principles. Rather, it aims to explore how micro-interaction design functions as a medium of cultural adaptation, shaping user interaction patterns across different cultural contexts within music streaming services.

1.3 Structure of the Thesis

This thesis consists of six chapters. Chapter 2 reviews UI/UX, micro-interaction theories and cultural influences, establishing the theoretical framework. Chapter 3 details the research design, data collection, and analysis methods. Chapters 4 demonstrate the design differences between Spotify and NetEase Music and analyse their cultural implications. Chapter 5 discuss the interpretation of the result, provides the design insights, and suggests directions for future studies. Finally, Chapter 6 summarizes the research findings.

2 Literature Review and Theoretical Framework

This chapter helps to understand some of the key concepts mentioned in the study. The following information integrates academic theories related to user experience and user interface, their characteristics in music apps, the concept of micro-interactions, micro-interactions in music streaming apps, and cultural dimensions, in order to provide academic support for the research design.

2.1 UX/UI

UX, short for User Experience, is the core of interaction design. It represents the overall feeling and emotional connection a user experiences when using a service or product. The term was first proposed by American cognitive psychologist Don Norman in the 1990s. Norman believed that the goal of user experience design is not only to meet users' rational needs but also to address their emotional needs, as users are emotional beings. He expanded experience design to include emotional interaction between users and products, proposing three emotional levels—visceral, behavioral, and reflective—which correspond to three levels of user needs: what kind of feeling they want, what they want to do, and who they want to become (Norman 2004, Chapter 3). These needs also imply that a good product should balance functionality, usability, and emotionality, with emotionality often linked to brand loyalty.

UI, as a part of UX, refers to User Interface. It determines the visual presentation and interaction logic of a product and serves as the medium through which users interact with it. According to Sarah Gibbons' (June 2021, min. 1-2) analogy, UX is like the taste, quality of ingredients, and baking of a cake, while UI is its appearance. In short, the two complement each other and are key to building quality products and services. In the field of digital products and services, with the rise of mobile devices and streaming technologies, UX/UI design has increasingly become a critical competitive factor.

2.1.1 UX/UI for music streaming services

In the context of music streaming service, which are emotionally driven products, their UX and UI design often bear more diverse characteristics. Joshi (May 2023) pointed out that for this type of App, people hope to spend the most time on the music listening rather than figuring out how to interact with the interface. This seems to imply that its user experience should be designed more smoothly, and the interface should also be more intuitive. The overall seamless experience and consistency have been repeatedly stated out to bring higher user engagement and lower user churn rates to music streaming applications (Jelizaveta & Nkpoikanna 2024, 39-40).

As music streaming services become increasingly embedded in users' daily lives, their expectations for such products continue to rise. In fast-paced modern life, users seek joy and relaxation through music. Li (2018) emphasizes that modern music app design should highlight technological capabilities while also focusing on emotional experiences, optimizing UX across visual, functional, and content dimensions. This aligns with Norman's concept of "emotional design," where the ultimate goal of functionality and content is to enhance the user experience.

Li (2024) states in his study that users' sensory and social experiences with music apps significantly influence UX optimization and loyalty building. Aesthetic interface design and rational function layout enhance pleasant and smooth sensory experiences, thus improving UX; meanwhile, social interaction features allow users to express themselves and connect with others, fostering an emotionally expressive atmosphere that resonates with users, increases their desire to use the app, and boosts loyalty.

2.1.2 User Interface Element in Music App

The interface of mobile music apps is typically composed of multiple hierarchical functional modules, aiming to fulfill core needs such as song playback, content discovery, personalized recommendations, and personal music space management.

First is the navigation bar, which forms the basic structure of the app. Commonly located at the bottom of the screen, it usually includes main entry points like "Home," "Search," "Play," "Playlists," and "My," serving as the primary path for switching between functional modules.

Next is the content display area, where users acquire information and discover music resources, typically including the recommendation page, search page, and playlist page. The homepage often centers around personalized recommendations, using big data to analyze users' listening preferences and providing timely updates. It was stated that developing accurate personalized recommendation features is crucial for enhancing user experience (Li, 2024), as it helps users quickly find music that matches their tastes and reduces the time spent searching.

The song playback page is the core interface, concentrating the album cover of the current song, progress bar, lyrics, and control buttons. It is one of the most visually and functionally dense pages and often incorporates animations to improve feedback and operational smoothness.

The personal space area usually displays users' listening history, created playlists, as well as settings and personal account information.

2.2 Micro-interaction: Definitions and Roles

Micro-interactions refer to single interaction events between users and digital products. They are task-based, designed for specific use cases, and serve to complete a single function (Saffer 2013, 1-3). Micro-interactions are ubiquitous in daily life. One of the most common examples is when an iPhone is switched to silent mode: the device vibrates and displays a mute icon on the screen. Typically, a micro-interaction lasts no longer than four seconds from start to finish (Ashbrook 2010, 7-8).

As the term suggests, “micro” refers to the subtle details within interactions—often unnoticed, yet indispensable. They provide delightful “moments of manipulation” that enable users to complete small-scale interactive tasks (Soegaard, 2024). Antal (2022, 42) argues that micro-interactions should be included in digital media curricula as they are a crucial component of UX, offering tangible benefits in learnability, error prevention, user satisfaction, and mobile app usability. The effectiveness of micro-interactions stems from their ability to satisfy users’ natural desire for confirmation—immediately signaling that their action has been registered while delivering a visually rewarding response (Babich February 2016).

Jiayang (2023) defines micro-interactions as the embodiment of dynamic effects within the interface. By combining and linking static elements with dynamic effects, they enhance understanding and operational efficiency, and through animation, they can evoke emotions, aesthetics, and resonance in users. As the refined details of a user interface, micro-interactions can maximize both usability and emotionality, serving as a crucial pathway to improving user experience.

As Saffer (2013, 19) points out that truly excellent micro-interactions can do more—they can create *Signature Moments* and build brand effects, such as Facebook’s thumbs-up like button or the iPod’s circular scroll wheel. Clearly, micro-interactions are independent of core “functions.” While functionality determines whether a product attracts users, micro-interactions influence whether users stay.

2.2.1 Micro-interactions in Music App

In music apps, micro-interactions often take the form of animations, vibrations, or color/icon changes to convey system status, helping users determine whether a task has been completed, thus enhancing the sense of control and enjoyment in interactions.

One of the key roles of micro-interactions is allowing users to complete tasks with minimal disruption, making them especially relevant to music streaming apps. For example, progress bar scrubbing and real-time lyric synchronization (where lyrics highlight in sync with the music) help reduce

interruptions and enhance immersion. These music-specific micro-interactions are primarily designed to optimize playback experience and deepen user engagement. Their implementation in music apps can be categorized into five key types:

- Playback control (e.g., seamless transitions between play, pause, and skip functions)
- Gesture interactions (e.g., swiping to change songs or adjust volume)
- Animated feedback (e.g., visual effects when liking a song)
- Recommendation mechanisms (e.g., AI-driven song suggestions)
- Social interactions (e.g., real-time comments and sharing features)

2.2.2 Dan Saffer's micro-interaction model

Dan Saffer (2013, 14) deconstructs micro-interactions into four key elements: Trigger, Rules, Feedback, and Loops & Modes (see Figure 1). Each of these elements plays an essential role in the completion of a micro-interaction:

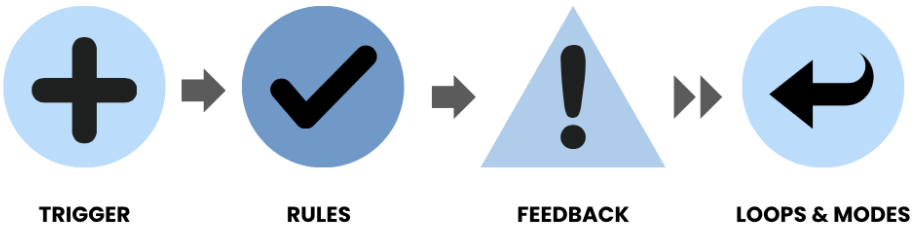

Figure 1. The Structure of Micro-interactions (adapted from Saffer 2013, 14)

1. Trigger: The action that initiates a micro-interaction, usually activated by the user. Triggers can be physical (e.g., manual input) or auditory (e.g., voice commands like "Hey Siri"). In music apps, common triggers include tapping the play button, swiping to change tracks, or adding a song to favorites.
2. Rules: The underlying logic that dictates how the micro-interaction behaves, defining how it guide users achieve their goals (Saffer 2013, 53).
3. Feedback: The perceptible response to a user's action, typically conveyed through subtle UI changes (Alita October 2018). For instance, when a user favorites a song, the favorite icon may change color or display an animation, visually confirming the action.
4. Loops & Modes: Loops refer to the continuous and repetitive nature of an interaction, while modes alter interaction rules based on context. A typical example of looping behavior in music apps is auto-play—once a song finishes, the next track starts automatically unless the user

pauses playback. Even when users switch between modes (e.g., from “repeat one” to “shuffle”), the looping mechanism remains active. Modes, on the other hand, modify the interaction paradigm. For example, when switching from standard playback to “driving mode”, the UI simplifies to minimize distractions while driving.

This study will analyze the core micro-interactions of both apps using Dan Saffer’s framework, deconstructing their triggers, rules, feedback mechanisms, and loop structures to reveal how these elements shape user experience.

2.3 The impact of Culture on Interaction Design

In Saffer’s book “Micro-interactions: Designing with Details”, he presents a clear example. In a previous version of the Apple iOS voice settings interface, a symbolic label (Figure 2) was used for speech rate adjustment: a turtle and a rabbit were placed on opposite ends of the slider, referencing the fable “The Tortoise and the Hare”. According to Saffer, this was a novel and intuitive design at the time. However, for users from cultural backgrounds unfamiliar with the story, the symbolism might have been confusing.

Figure 2. Screenshot of Apple’s iOS Speak Selection (Saffer 2013, 41)

This example demonstrates that micro-interaction design is not culturally neutral. The same interaction may be perceived as natural, unfamiliar, or ineffective in different cultural contexts.

Aaron, M and Gould, W discussed this phenomenon as early as their 2000 study on how cultural values influence global web interface design preferences. They argued that cross-cultural theory would become a fundamental aspect of UI design and that, as the web continues to evolve globally, applying cultural dimension theories will be essential for both successful UX theory and practice (Aaron, M. Gould, W 2000).

The following introduces cultural dimension theories that help reveal differences in information processing, risk preferences, and social expectations across cultures. These theories aim to uncover the cultural drivers behind design differences and provide localization guidance while supporting the interpretative work of subsequent research.

2.3.1 Hofstede's Cultural Dimensions Theory

The role of culture in UI/UX design has long been a subject of interest. Dutch social psychologist Geert Hofstede's (2001) Cultural Dimensions Theory provides an essential framework for cross-cultural design research. This theory consists of six key dimensions: Power Distance, Individualism vs. Collectivism, Uncertainty Avoidance, Masculinity vs. Femininity, Long-Term vs. Short-Term Orientation (Hofstede 2001, 29).

Among these, the following three core dimensions are particularly relevant to micro-interaction design in music apps:

- Individualism vs. Collectivism: This dimension measures whether a society prioritizes individual independence or group belonging. (Hofstede 2001, 209-210) Individualistic cultures favor personalized recommendations, while collectivist cultures emphasize social interactions. This is expected to influence how recommendation algorithms are presented and the emphasis placed on social features in the interaction design.
- Uncertainty Avoidance: This dimension evaluates a culture's tolerance for uncertainty and ambiguity. High uncertainty avoidance cultures prefer clear guidance and structured designs, whereas low uncertainty avoidance cultures are more open to exploration and flexibility. (Hofstede 2001, 169-170). This is likely to impact design elements such as navigation feedback, error messages, and predictable interaction patterns.
- Long-Term vs. Short-Term Orientation: This dimension assesses whether a culture focuses more on long-term planning or immediate gratification (Hofstede 2001, 359-360). Long-term-oriented cultures (e.g., China) value future planning, gradual accumulation, and delayed rewards, while short-term-oriented cultures (e.g., Western countries) emphasize instant feedback and direct experiences.

2.3.2 High-Context and Low-Context Cultures

American anthropologist Edward T. Hall's book "Beyond Culture" (1976) explains how different cultures rely on different methods of communication. He proposed that culture can be divided into High-Context and Low-Context. In high-context communication (such as Eastern countries), people rely on implicit information, shared contexts, and non-verbal cues to understand the content of communication. In low context (Western countries), information encoding is more relied upon to convey information, requiring minimal background inference and emphasizing logic behind language (Edward 1976, Chapter 7).

The research by Usunier and Roulin (2010) indicates that high-context and low-context communication styles have a significant impact on the design of B2B websites content (such as the selection of colors and graphics). Also, the research published by Fakkar, Nami and Soleimani (2010) emphasizes that for achieving effective localization of website design, merely translating the text is not sufficient. It is also necessary to consider the cultural influence of high and low contexts, which is an indispensable way to build cultural identity.

3 Methodology

This chapter outlines the specific research methods adopted in this study and explains how they support the research objectives. Each step of the methodological framework is presented in its own subsection, covering the design purpose, operational process, and the approach to data analysis. Additionally, the chapter addresses the reliability of the methods and potential ethical considerations.

3.1 Research Design

This research adopts a qualitative design, using comparative analysis as the core strategy to identify divergent features, cultural adaptation strategies, and corresponding user feedback. Spotify and NetEase Cloud Music were selected as the study subjects.

This study adopts a three-stage methodological framework that includes interface analysis, user testing, and cultural interpretation. The approach is designed to systematically uncover differences in micro-interaction design between the two apps from the perspectives of design, user perception, and cultural background, as well as to explore the possible logic of cultural adaptation behind those differences.

The first stage is interface analysis, using Dan Saffer's four-element structure of micro-interactions as the primary analytical tool. This model is well-suited for structurally interpreting the functional components and behavioral logic of micro-interactions, enabling researchers to precisely identify design differences in task execution between the two platforms. Based on this, the study compares each app's micro-interaction performance element by element, laying the groundwork for subsequent validation through user experience testing.

The second stage involves user testing, which combines task-based interaction with post-test interviews to gather user experience data. This method is widely used in UX research due to its ability to capture direct user feedback in realistic settings, revealing the relationship between design preferences and behavioral patterns. Following Nielsen's (1993, 118-120) principles of user testing, the study defines five core operational tasks and collects user feedback through post-test interviews, focusing on interface comprehension, experiential preferences, and emotional responses.

The third stage is cultural analysis, aiming to interpret the design differences identified in the previous two stages from a deeper cultural perspective. To do so, the study draws on cultural theories by Hofstede and Hall, which offer a useful lens for understanding cross-cultural differences in values, communication styles, and user behavior. By aligning the findings from interface analysis and

user testing with these dimensions, the study seeks to explain how specific micro-interaction designs in Spotify and NetEase reflect their respective users' cultural expectations.

This multi-method, step-by-step approach offers the following advantages: interface analysis provides a structured perspective on differences; user testing captures real-time perception; and interviews allow for deeper insights into users' internal cognition and cultural values, enhancing the comprehensiveness and explanatory power of the findings (Creswell, 2014).

3.2 Comparative Analysis on Micro-interaction deconstruct

In the first phase, this study breaks down the micro-interactions of both music apps, steps including:

1. Identifying key micro-interactions from core user tasks.
2. Conducting task-level decomposition. Static interface comparison is insufficient to uncover differences, so this study emphasizes interaction flow triggers and feedback, decomposing identical functions from Spotify and NetEase Music into key steps for horizontal comparison. Dan Saffer's framework will be applied, breaking each micro-interaction into Trigger, Rules, Feedback, and Loops & Modes to assess design intent.
3. Data collection and organization: Testing will be conducted on a unified device model—iPhone—to ensure consistency and reduce variables. Screen recordings will be captured using the iOS native feature, and UI states will be screenshotted to visualize the behavior of specific micro-interactions. For comparing animation feedback, screen recording frame rates will be reduced, and animations will be reviewed frame by frame in the iPhone's gallery. Some non-visible data, such as algorithmic mechanisms, will be obtained from each platform's privacy policy. All extracted data will be tabulated as the Table 1 below.

Table 1. Structure of specific micro-interactions analyzation

Specific Micro-interaction		
Dan Saffer's Structure	Spotify	NetEase Music
Trigger	Describes how the micro-interaction is initiated in both apps—direct or complex? Via tap, long press, drag, or swipe?	
Rules	Explains the functional rules in both apps, such as operational limitations, selection ranges, and system logic.	

Feedback	Details the feedback mechanisms in both apps, including visual (color changes, animations), auditory (sound effects), haptic (vibrations), and response speed.
Loop & Modes	Indicates whether the interaction has long-term effects (e.g., influencing recommendation systems), and whether it follows fixed or variable patterns. If the interaction is one-off and has no lasting impact, this field will be left blank.

The Specific Micro-interactions were selected based on the following criteria:

- High frequency of use: These interactions influence daily usage which can best reflect interaction logic.
- Noticeable design differences: Meaningful differences are necessary for effective comparison and deeper analysis of design logic and cultural context.

Based on the criteria, eight micro-interactions were selected from the core contents of music apps (search/discovery, playback control, and song management). They span different interaction types and reflect core design philosophy differences between Spotify and NetEase Cloud, with significant contrast in all four Dan Saffer dimensions:

- Search & Discovery: Search result presentation, personalized recommendations.
- Playback Control: Play/pause, track switching, lyrics & progress bar interaction, playback mode switching.
- Song Management: Liking/favoriting, adding/removing from playlists.

3.3 User Testing and Interview Procedure

In this study, user testing serves as the critical bridge between interface analysis and cultural interpretation. Its main goal is to collect users' subjective perceptions of micro-interaction design. According to Jakob Nielsen (1993, 105), user testing is the most direct and effective way to evaluate user experience and cannot be replaced. He argues that by observing how users complete specific tasks, researchers can identify interface issues and gather behavioral and emotional feedback in realistic usage scenarios. He also notes that for aspects of user experience that are difficult to quantify but closely tied to user satisfaction, interviews offer the simplest way to gather insights (Nielsen 1993, 134).

Accordingly, this study adopts a combination of task-based user testing and semi-structured interviews to better understand how users experience and evaluate key micro-interactions in both Spotify and NetEase Music. This approach not only helps verify insights from the interface analysis stage but also provides firsthand user data for the subsequent cultural analysis. General setup of this phase will be introduced below.

Sample Size and Composition

Six participants were selected and divided into two groups: three Chinese users (familiar with NetEase Cloud Music) and three Western users (familiar with Spotify). Regarding sample size setting, prior research (Nielsen 1993, 143) mentioned that 5 is a golden number, as the first 5 users in testing can typically uncover major issues. Meanwhile, a sample size of 6-8 has been suggested as appropriate for product iteration focused user testing (Tullis & Albert 2013, 58-59).

Given that this study focuses on micro-interaction design rather than full-scale usability evaluation, a small but targeted sample effectively balances data richness and feasibility.

Participant Selection Criteria and Rationale

- Age range (18–35 years)

The statistics indicate that in Finland (2024), among individuals who streamed or downloaded music online, 98% were aged 16-24 and 96% were aged 25-34 (Clausnitzer 2024). However, global Spotify download data reveals that users aged 25-35 account for the largest proportion (Drive Research 11 October 2024). Given this, the study sets the age range to 18-35 years, as this group represents the primary user base of music streaming apps. Their adaptability to interface interaction and technological familiarity makes them representative of mainstream young users.

- Weekly usage time (⩾5 hours)

Participants are required to use music apps for at least five hours per week, ensuring stable and deep user engagement, which allows them to recognize subtle interface interaction differences based on personal experience.

- Cultural background

Each participant must be highly familiar with their domestic music app (NetEase Music for Chinese users; Spotify for Western users) and completely unfamiliar with the app from the other cultural context. This setup ensures that the observed behaviors reflect authentic first-time cross-cultural experiences rather than biases or transfer effects from previous usage.

- No background in UI/UX design or music industry

Participants without professional backgrounds are selected to avoid overly technical or aesthetically biased responses. This helps ensure that the feedback reflects natural perceptions typical of general users.

Testing Procedure

a. Pre-test briefing: Participants are informed about the purpose of the test (emphasizing that the subject of evaluation is the app, not the participant), the process is explained, and consent is obtained for recording and anonymized data use.

b. Task execution: Participants use the app they are unfamiliar with and complete five pre-defined tasks in order, covering core features of music apps. (See Table 1 for task details.)

c. Real-time observation: During task execution, the think-aloud method is applied to capture participants' immediate thoughts, actions, and initial emotional responses. Nielsen (1993,123-124) highlights this method as the single most valuable approach. By encouraging participants to verbalize their thoughts while using the product, researchers gain insight into how users understand the interface and whether any misunderstandings occur during interaction.

d. Post-test interview: After all tasks are completed, each participant takes part in a semi-structured interview based on nine open-ended questions (see Table 2), focusing on task-specific difficulties, intuitive impressions, interface comprehension challenges, and perceived cultural fit.

Preset Task Design

Task design aligns with the basic principles of test task selection (Nielsen 1993, 118), picked the core interaction area same as the stage interface analysis and additionally includes social interaction, as the two apps differ significantly in this area (e.g., NetEase has comment sections, which is not available on Spotify). Since these cannot be captured via static UI comparison, they are integrated into the testing phase. Meanwhile, Kuniavsky (2010, 220-221) proposed that the creation of tasks should be reasonable, specific and in the order of reality. Therefore, to simulate real-world usage, micro-interactions are combined into scenario-based comprehensive tasks rather than isolated tests, avoiding unnatural segmentation. As described above, five tasks are defined as the Figure 3 below:

Task 1. Discover：Explore a Song via Search & Personalized Recommendation
User goal：Search for a specific song via Search page and Personalized Recommendation.
Microinteractions Involved: Search bar interaction + Search result list + Recommendation display + loading interface

Task 2. Playback Controls
Use goal: Try to Play/Pause, Switch songs, Change Play Mode.
Microinteractions Involved: play/pause button feedback + replaying feedback + Playback mode toggle + confirmation feedback + Next track button interaction + song transition animation + UI synchronization

Task 3. Interact with Lyrics and Progress Bar
User goal: View lyrics interface and adjust progress to 1:30.
Microinteractions Involved: play progress bar interaction + lyrics interface/highlight animation

Task 4. Song Management: Like and add
User goal: Like a song and Add/Delete a Song to Playlist.
Microinteractions Involved: Like button interaction + Add to playlist feedback + Removing song feedback

Task 5. Social Interaction
Spotify tester goal：Create a shared playlist with a friend and invite them to collaborate
NetEase Music: View the comments section of a song and engage by liking a top comment
Microinteractions Involved: Playlist creation flow + Invite friend interaction + Loading comment + Liking a comment interaction + comment sorting

Figure 3. Tasks for the user testing

Interview Questions

Interview questions are designed to explore how users perceive and interpret interaction differences, which interaction style aligns with their habits, and whether they associate design with cultural traits. According to Rogers, Sharp and Preece (2015, Chapter 7.4.3) in the book “Interaction Design”, semi-structured interviews combine both closed and open-ended questions. Interviewers should prepare a predefined question guide to both elicit new themes from participants and serve as a flexible framework for extending discussions during testing. As Figure 4 below, questions are grouped into four topics—User preference, Interface comprehension, Emotional response and Explanations—with 9 guiding questions and room for flexible follow-up based on the testing session. In addition to these elements, interviews should incorporate probing and prompting. Therefore, during this study, the researcher actively employed questions such as "Why?" and "What else would you like to share?" to guide deeper exploration.

User Preferences

1. Which app's interaction design (information presentation/interactive buttons) feels more intuitive to you? Why?
2. Was there any design choice that made you think "This is a smart way to do it"?

Interface Comprehension

3. Were these actions easy to learn when using the app for the first time? Was there any part that required extra thinking?
4. Do you think the interface's prompts, information, and feedback are sufficient and clear?

Emotional Response

5. At any point, did you feel emotionally understood or connected through the app's design?
6. Were there any moments where you felt confused or frustrated? Why?
7. Were there any actions that felt very natural and easy to perform?
8. Were there any actions that you found new, surprising, or interesting?

Explanations from Cultural Perception

9. Do you think your expectations and preferences may be influenced by your cultural background or upbringing? In what way?

Figure 4. Guiding questions for the semi-structured interview

Test and interview environment setup

Following Kuniavsky's (2010, 232) recommendation in the book "Observing the User Experience" in user testing physical space setting, UX studies should be conducted in quiet, comfortable environments to reduce distractions and encourage expression. The layout should resemble real-world usage rather than a lab. Lazar, Feng & Hochheiser (2017, 277-279) also suggests testing in users' familiar settings to ensure natural responses.

Following this guidance, all tests and interviews are held in a quiet, private, and familiar location—such as a campus meeting room. Also, unified devices (iPhone) will be used, with stable internet connections and pre-test technical checks to ensure smooth operation and reduce extraneous variables.

Data Collection and Analysis

"Real-time data capture is crucial," noted Rogers et al., emphasizing that the optimal documentation methods for interviews are audio recording combined with notetaking, it's also the first step of

the analysis (2015, Chapter 7.3). During the testing process, the screen recording, and audio recording functions of an iPhone will be used to document the operation paths and verbal feedback. Meanwhile, the researcher will observe the user's facial expressions in real-time to record emotional responses (such as confusion or surprise). The entire interview process will also be audio-recorded. Afterward, the recordings will be transcribed into text, and the researcher will manually review the transcriptions to remove meaningless content such as repetitive speech or interruptions, resulting in a refined version (which can be found in the appendix).

Given the small sample size and the fact that most data in this study are textual descriptions and behavioral observations, the data analysis will adopt thematically. The researcher combines real-time feedback from the task execution with detailed responses from the interviews. Interview questions were designed to supplement observational data. As a result, the final user observation summary for each task includes not only users' immediate perceptions during interaction but also their later reflections on emotion, cognition, and cultural adaptability, providing a more comprehensive and multidimensional view of the user experience.

At this stage, by organizing user behavioral data and interview data, the testing content is gradually coded, keywords are extracted, and determining factors are summarized to analyze the impact of micro-interaction design on user experience and explore users' operating patterns and adaptation processes under different cultural backgrounds.

3.4 Cultural factor Mapping

Finally, in the cultural analysis section, this study will extract users' subjective experiences of interface design from the interviews and conduct comparative analysis using Hofstede's Cultural Dimensions theory and the High-context vs. Low-context Culture communication.

The specific method involves establishing a theory-driven analytical framework, matching users' verbal expressions, behavioral preferences, and interface expectations from the interviews with cultural dimensions. This method draws from previous practices of applying the Hofstede model in user research (Marcus & Gould, 2000; Reinecke & Bernstein, 2013), and identifies reflections of cultural characteristics in user experience through interview keyword summarization and comparison with cultural dimension labels. For example, user statements emphasizing "secondary confirmation" are associated with high uncertainty avoidance cultures, while the behavior of preferring to "view song comments" is categorized under collectivist tendencies.

3.5 Data Reliability

By integrating interface difference analysis, user perception testing, and cultural frameworks, this study ensures that the final conclusions are grounded in empirical data and supported by theoretical background, thereby constructing a robust cross-cultural design comparative analysis.

The methodological framework of this study ensures systematic research procedures, effectively explains design differences and user perception differences, verifies their impact on user experience, and places them within cultural contexts for interpretation. The step-by-step research method improves the reliability of the findings and contributes to a deeper understanding of how cultural values are reflected in micro-interaction design.

3.6 Ethical Consideration

This study strictly adheres to academic research ethics. Firstly, it follows the principle of informed consent: before user testing, all participants will be informed of the research description, including the purpose, task process, and data usage, ensuring their voluntary participation based on full understanding (Emanuel et al., 2000). A detailed research description is inserted in the user testing plan, which can be found in the appendix 9.

Secondly, to protect user privacy and data security, this study refers to the General Data Protection Regulation (GDPR), ensuring that all user data are anonymized and used solely for academic research without involving any personal identification information (Regulation (EU) 2016/679, GDPR). Furthermore, in accordance with the principle of data minimization, this study will only collect and retain the minimum amount of user data necessary to carry out the research tasks. This approach aligns with Nissenbaum's theory of *contextual integrity*, which emphasizes that privacy is not merely about control or secrecy, but about the appropriateness of information flows within specific contexts (Nissenbaum, 2011). By respecting the contextual norms governing user interactions within music apps, the study ensures that all data collection is not only minimal but also contextually appropriate and ethically justified.

At the same time, the study maintains fairness and impartiality throughout research design and analysis. All user tasks and interview questions are presented objectively, avoiding suggestive guidance to ensure data reliability (Creswell 2018, Chapter 9). In the evaluation of user experience, this study also refers to Nielsen's Heuristic Evaluation Principles (1994, Chapter 2) to ensure researcher neutrality in analyzing micro-interaction experiences, minimizing subjective bias.

4 Results & Findings

This chapter will demonstrate the obtained data in accordance with the method steps, including the comparison results after the disassembly of micro-interactions, the summary of intuitive observation data and interview contents related to the test participants, as well as the initial cultural mapping.

4.1 Micro-interaction Comparative Analysis Result

In the horizontal comparison of the eight core micro-interactions, Spotify and NetEase Music show significant differences in trigger methods, feedback mechanisms, and logic design. For a full breakdown of the micro-interaction table, please refer to Appendix 1-8. This chapter will demonstrate the key findings for each micro-interaction combine with the visuals:

Search & Discovery:

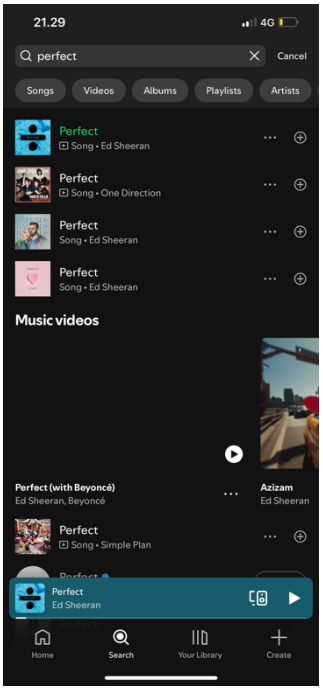

Figure 5

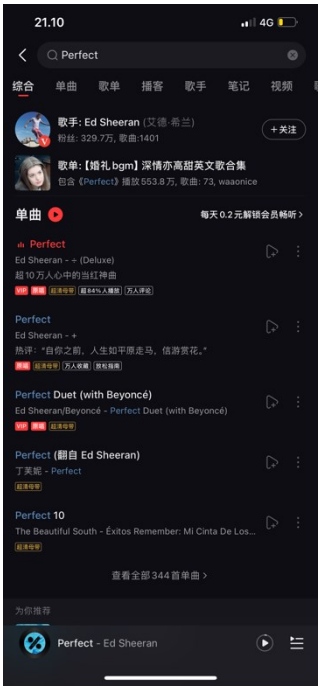

Figure 6

- In the search interface and result presentation, Spotify provides a dedicated “Search” page in the bottom navigation bar for quick access. As the user types, real-time suggestions update dynamically. After entering keywords, the system categorizes results by content type (e.g., songs, albums, artists, playlists), and the search list emphasizes images, featuring clear structure and visual clarity, highlighting operational convenience (See Figure 5). NetEase Music offers multiple access points to the search page and provides more enriched “information giving”

during the search process and results. It supports keyword association and “hot search lists,” emphasizing textual information structure in the search results. Some search results include additional tags such as “Recently Played” or “10k+ Comments”. A heart icon is used to indicate previously liked content (See Figure 6).

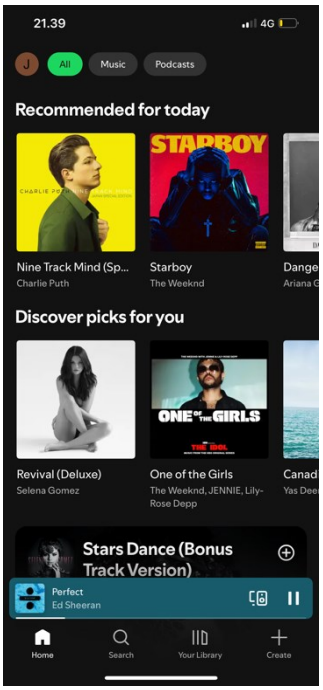

Figure 7

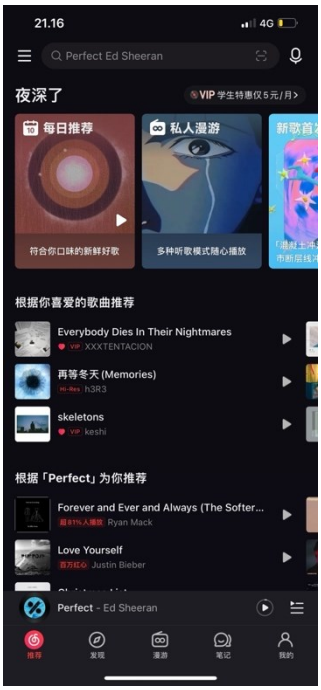

Figure 8

- In personalized recommendation interactions, Spotify prefers algorithm-driven recommendation lists and periodic update mechanisms to shape user engagement. Spotify’s “Home” page acts as a passive recommendation feed, where personalized content such as “Your Top Mixes,” “Recommended for today,” and “Discover picks for You” are updated weekly (see Figure 7) based on listening history, artist preference, and location data. Interactions here are designed for flow and stability, with no user-facing controls for switching recommendation modes. In contrast, NetEase Music offers more control and text prompts over content sources, preference settings, and feedback mechanisms, forming a dynamically adjustable recommendation logic. Users may provide direct feedback via options such as “Not Interested” or “Recommend More Like This”. On NetEase Music, personalized recommendations appear on the “Recommendation” page and include modules such as “Daily Recommends,” “Private Radar,” and other clearly labeled sections, such as “Recommended based on your favorite songs” and “Recommended for you based on [specific song]” as shown in Figure 8.

Playback Control:

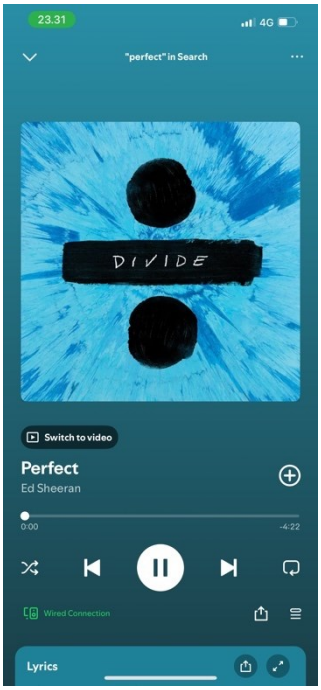

Figure 9

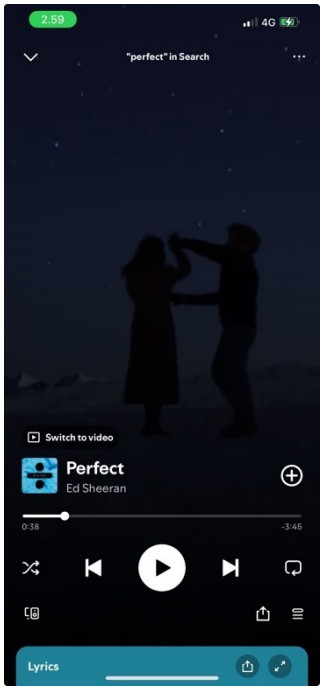

Figure 10

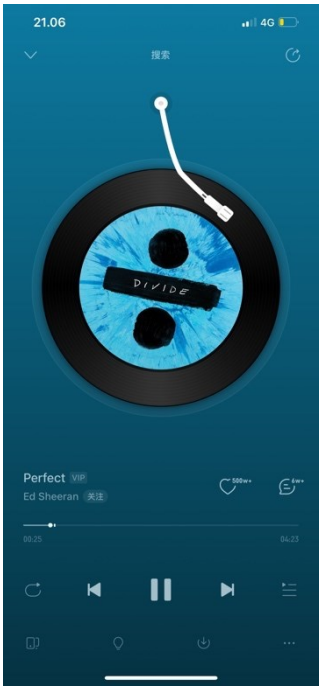

Figure 11

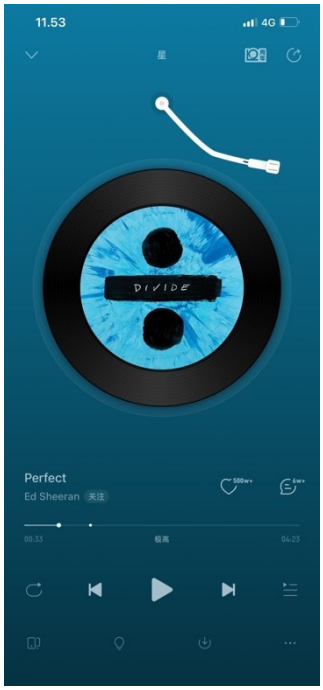

Figure 12

- In the play/pause operation, the overall interaction path of Spotify is mainly minimalist and unified operation response, and the playback interface is mostly static icon change, avoiding excessive animation elements and focusing on directness. By default, the playback interface displays a static square album cover (see Figure 9). When the user adjusts the settings or plays a widely known song, the interface may instead show a dynamic video, usually a looping MV clip (see Figure 10). Notably, the animation is not synchronized with the playback status— it continues playing even when the music is paused. On the other hand, NetEase Music pays more attention to visual and interactive expressiveness, such as the switch of playback status accompanied by obvious animation prompts - The rotation and stillness of the vinyl record, and the lifting and lowering of the tonearm - which represents playback and pause (see Figure 11 *&12*).

- In terms of switching song interaction, both apps support the switch from the previous song to the next song by button click or swipe gesture. But Spotify keeps functionality first, emphasizing operational path consistency and responsive efficiency, visual feedback for the horizontal dynamic slide of the overall page, and simple design. NetEase Cloud attempts to provide a richer perception and operation experience, which is reflected in the consistency of visual presentation of the dynamic effect of cutting songs, and the special effects of its playing state

are connected with each other - the animation of changing records is used to reflect the cutting songs and continue the feelings of design. In addition, NetEase Cloud does not emphasize the operational efficiency of "direct trigger", and it has a "gradual in and gradual out" processing on the sound effect of song switching.

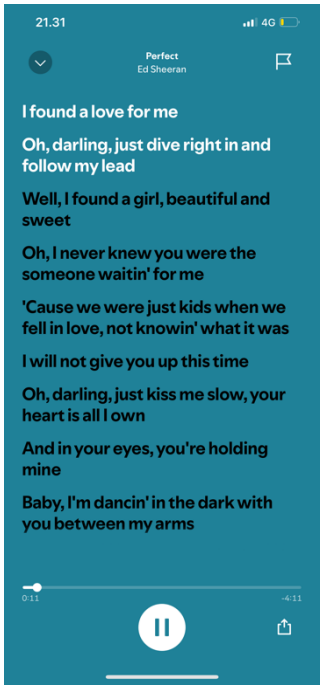

Figure 13

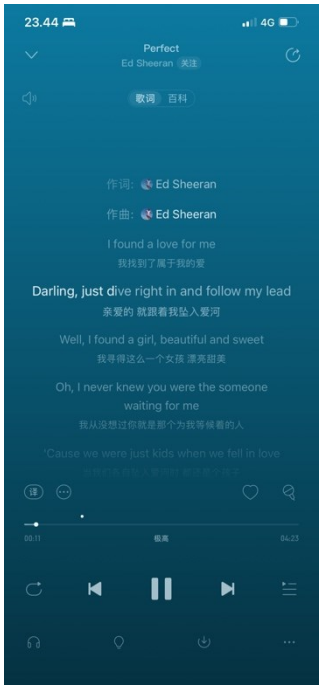

Figure 14

- Regarding the lyrics interface and progress bar drag, Spotify puts more emphasis on visual cleanliness and smooth listening, so as to avoid interfering with the main playback experience. Spotify treats viewing lyrics as an "add-on" feature and doesn't emphasize the need for its presence on the play page. NetEase takes the lyrics interface as the key area, and the lyrics are designed to be embedded in the play page as the main area. Both apps support playback and lyrics synchronous scrolling, the key difference is Spotify for sentence-by-sentence highlighting (Figure 13), while NetEase cloud for word by word (Figure 14). The feedback Spotify provides when dragging the progress bar focuses on the display of the time stamp, the scaling of the control point, and the movement of its position. The lyrics scroll synchronously with the drag, and the sense of "broken" of the jump audio is minimized. NetEase pays attention to visual (progress bar overall scaling) and tactile (vibration) feedback when dragging, but there is a slight "stuck" listening sense on the audio jump.

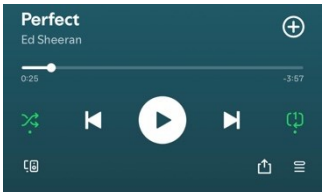

Figure 15

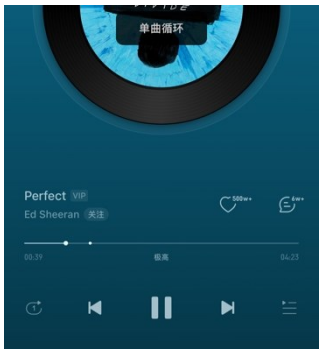

Figure 16

- In terms of playback mode switching, Spotify's random mode is a separate trigger button, and the list loop and single loop are in the same position, which can switch between each other, and the mode logo is simple and direct. When switching, the icon changes clearly (Figure 15) but does not accompany the prompt message, keeping interference low. The random mode of NetEase music is in the same position as the logo of the list cycle and the single cycle. Click to trigger the switch in a fixed order, and the switch is accompanied by the logo transformation and pop-up text prompt information to strengthen the user's understanding and recognition of the current playback mode (Figure 16).

Song Management:

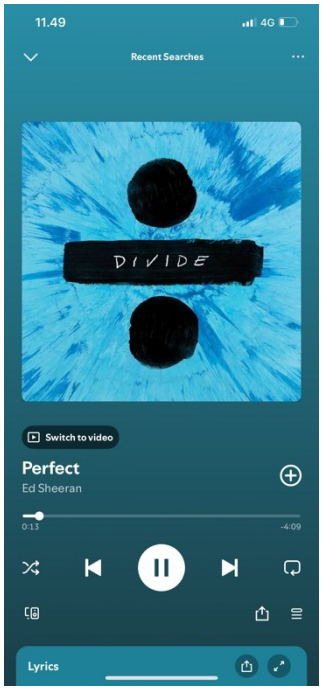

Figure 17

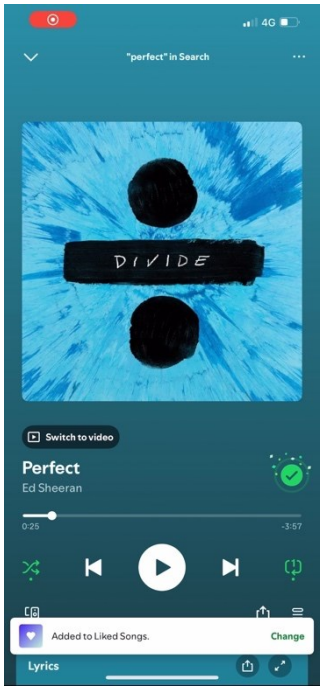

Figure 18

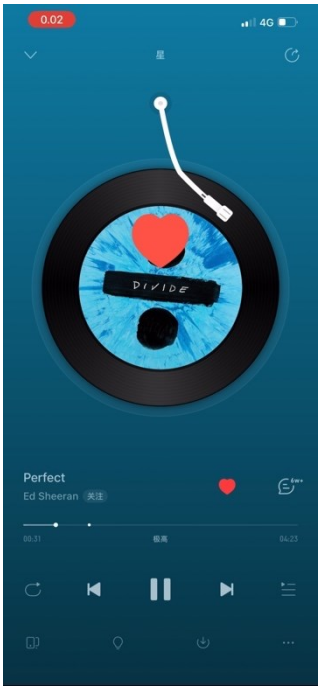

Figure 19

Figure 20

- Regarding the micro-interaction of "like a song", Spotify emphasizes structural simplicity and system stability, while NetEase Cloud emphasizes user participation and emotional expression. In Spotify, the feature is presented as a "plus" icon (Figure 17). After the user clicks, the song will be automatically Added into the "Liked Songs" playlist. The system provides an icon change, an action effect of "throwing coloured ribbons" and an "Added to Liked Songs" prompt at the bottom as instant feedback (Figure 18). After that, the song is identified in the screen with a green checkmark. If the user wants to cancel the collection, need to click the mark, enter the song list uncheck and complete the operation, the feedback is the icon changed back to the plus sign and text prompt. In contrast, NetEase cloud music uses the red heart icon as a collection button, and the triggering method is more diverse, supporting both click the icon collection and double click the screen trigger in the playback interface. Visual feedback is even more significant, including a zooming red heart action, a large heart animation, and a 2-second lag top text prompt (Figure 19 & 20). The number of likes for the song is consistently displayed at the top right corner of the heart icon, visible without any user interaction. To cancel the collection, just click the red heart again, the icon will be restored, and the system will display the cancellation prompt synchronously. In both apps, this behaviour is deeply tied to the recommended content.

- In the interaction of add/remove songs to the playlist, the interaction path of the two apps in "Add songs" is basically the same, but there are significant differences in the feedback after adding/removing. Although both are text information feedback, Spotify emphasizes the "purpose" information prompt, such as "added to *My playlist #1*" after adding a song to the playlist named “*My playlist #1*”. Emphasize its destination for the target song. The information feedback of NetEase is "collected to the song list" (with a simple logo), emphasizing the operation itself. Similarly, if you remove the song *Perfect* on the playlist page, Spotify will display "removed *Perfect*", and NetEase in the "removal" of the song path is longer than Spotify, first of all, Spotify supports the "removal" operation from multiple entrances such as the play page and song list, emphasizing fluency and continuous operation experience. NetEase Music is more emphasis on the confirmation feedback and revocable mechanism after the operation, enhance the user's sense of control over the content operation, and only in the song list page can find the "delete" logo, users click delete, will pop up a second confirmation window, users can choose to cancel or click delete again, no information feedback after deletion.

4.2 User Testing & Interview Observations

The data obtained from user testing and post-test interviews will be presented in two sub-sections. First, the direct feedback from Chinese and Western users regarding each testing task will be

narrated separately. Then, a summarized analysis of the semi-structured interview data will be provided. Before the narrative, a brief introduction to the six participants' backgrounds is included. Based on pre-test conversations, all six participants are regular users of music apps. Whether commuting, exercising, or working on text-based tasks alone, they frequently open music apps on their phones. The three participants from a Chinese cultural background who tested Spotify include a 21-year-old science undergraduate student (User A), a 25-year-old sociology graduate student (User B), and a 28-year-old media professional (User C). The Western participants include a 24-year-old Finnish business student (User E), a 27-year-old Swedish airport ground staff (User F), and a 33-year-old Finnish school teacher (User G).

4.2.1 Presentation of Participant Feedback

Task 1. Discover content via Search & Personalized Recommendation

Chinese users: "On the search and recommendation interface, I can't tell if clicking will lead to a whole album or just one song." (A) "Surprisingly, there are no ads." (C)

During their first experience using the search or browsing recommended content, Chinese users generally responded that Spotify's interface was clean and ad-free. Many users found the search entry point easy to locate but noted that the personalized recommendation page required some exploration and lacked appeal, reducing their motivation to click. Some users reported confusion regarding module titles on the homepage (e.g., "All," "Music"), feeling they were unclear. Although the search function itself was accurate, since it shared a page with recommendations, users were uncertain whether clicking led to a single track or a full album.

Western users: "It's refreshing, before clicking, everything feels unknown. I noticed the images used in the recommendation modules don't really relate to the artist or song covers—they're all about vibe." (E)

European users generally found the content-rich recommendation and search pages in NetEase Music novel, but at the same time, the dense information led to initial visual overload. When search results were presented, many mentioned, "The interface looks crowded. I don't know where to click right away," citing an overload of labeled items and needing time to adapt to the layout. But the good point is, both recommendation and search entries were easily located with minimal exploration effort.

Task 2. Playback Controls: Play/Pause, Switch songs, Change Play Mode

Chinese users: “Which playback mode takes priority?” (B)

“Compared to NetEase, Spotify’s playback screen feels 2D, it’s flat, though it allows vertical scrolling.” (C)

In the playback control task, Chinese users generally found Spotify’s basic playback operations smooth and intuitive but felt confused when switching playback modes. Several users did not understand why shuffle mode and other mode buttons were placed in different areas. According to their feedback, these buttons could simultaneously appear active—so which mode takes precedence in that case? All users expressed confusion about this. Additionally, all users disliked the MV animation clips in the playback screen and tried to find settings to disable this feature in favor of displaying the album cover only. They felt that such animations clashed with Spotify’s otherwise minimalist interface, which they preferred to remain consistently simple.

Western users: “Too many icons on the playback screen—it’s not easy to understand at a glance.” (E). “I really like the vinyl record design.” (ALL)

Western users quickly grasped basic operations while using NetEase Music’s playback controls. They expressed delight at the vinyl record interface and described it positively. User F stated, “I feel like just staring at the spinning ‘record’.” They spontaneously repeated the operations to observe how the vinyl animation responded to pause and skip actions. The playback mode switch button was seen as offering clear feedback, though the icon was considered small. While the functions were rich, some users felt they needed time to adapt due to the number of buttons on the interface.

Task 3. View lyrics and drag the Progress Bar

Chinese users: “Took a while to realize lyrics slide out from below—not placed prominently.” (A)

“Dragging the progress bar is smooth, and the lyrics move along, but since the lyrics are at the bottom, it feels inconvenient. Once the lyrics view is open, I can’t skip songs anymore.” (C)

During the task of viewing lyrics and dragging the progress bar, Chinese users commonly noted that the lyrics feature in Spotify was deeply buried and caused initial confusion. Some spent considerable time locating it. They placed high importance on the lyrics function and felt the bordered

design negatively impacted the experience. All users said the progress bar was smooth to drag, music jumped seamlessly, and they positively evaluated the auto-scrolling lyrics.

Western users: “The lyrics popped up accidentally.” (F&G)

“I feel like the interface got more cramped once the lyrics appeared.” (E&F)

Western users quickly found the lyrics feature in NetEase Music, mostly via accidental taps. Some said they felt insecure because the screen had too many buttons and triggering the lyrics with a light touch made them hesitant to interact. Once the lyrics appeared, the screen felt even more crowded. Most users found the progress bar smooth and time indicators clear. They were curious about the “chorus marker” on the progress bar, interacted with it, and expressed liking the design. Some also noted the font size of the lyrics was too small, affecting the experience.

Task 4. Add/Delete a Song to Liked Playlist

Chinese users: “So is ‘Like’ the same as ‘Add to playlist’?” (A) “The overall operation is fine, but conceptually it’s unclear.” (B)

When adding songs to favorites or playlists in Spotify, Chinese users generally found the icons for the favorites feature unclear. Most mistook the plus sign as just “adding,” not as “liking” a song. One user described the process of adding songs to playlists as resembling “file management,” lacking emotional cues. Another noted that in NetEase Music, “liking” and creating playlists were clearly separated actions, whereas Spotify blurred the distinction, making it feel like “an extra step” and requiring adaptation. However, during interviews, all agreed they could adapt to Spotify’s design logic with prolonged use, though a transition period was needed. They also found the process of undoing a “like” more complicated than in NetEase; accidental taps on the plus sign required triple the steps to undo. But for adding to or removing from custom playlists, they felt Spotify’s process was simpler and quicker.

Western users: “You have to open a bunch of small menus to add to a playlist—kinda annoying.” (F) “Unlike Spotify, where you can do it with one tap.” (G)

Western users generally found the heart icon in NetEase Music easy to understand. Even though they were used to Spotify’s “add” symbol, they quickly located and clicked the heart icon, and weren’t confused by the like count shown next to it. For adding or removing songs from custom playlists, they found the process somewhat cumbersome—especially when removing songs. They

found the confirmation pop-up redundant, as the deletion process already involved multiple steps, leaving little risk for accidental deletion.

Task 5. Social Interaction

Chinese users: “I didn’t know where to start—normally I’d expect a share button on the song page, but it turns out it starts from creating a playlist.” (C)

“Why share a playlist at all? It feels like collaborating on a group project and sharing a doc—kinda stressful.” (A)

In the social interaction task, Chinese users generally failed to complete the process of sharing a playlist and inviting friends in Spotify. Several users said that although they could find the share button, they couldn’t locate the invite friend option. One user described the sharing interface as resembling a work collaboration tool, lacking a social atmosphere. They felt that music tastes are highly personal and didn’t see the value or enjoyment in sharing playlists—even with close friends.

Western users: “Liking a comment is really easy—very intuitive.” (E)

“The comment section feels like listening to music on YouTube.” (G)

Western users were unfamiliar with the concept of a comment section in music apps, so they took some time to find the trigger button. When browsing the comment section in NetEase Music, they generally noted the abundance of comments and a strong sense of community in the interface. The act of liking comments was intuitive, and most users described the experience as similar to listening to music on YouTube. Some mentioned that the volume of comment content could be distracting, causing them to forget their original goal of listening to music.

4.2.2 Summary of Semi-Structured Interviews

Key points of the interviews are summarized according to the following topics:

User Preference

In terms of user preferences, users’ choices are clearly influenced by specific interaction details. Chinese users commonly reported that when using Spotify, the feedback from playback control buttons was too instantaneous and lacked transitions. The interface changes were perceived as overly “abrupt” after clicking, leaving little room for emotional buffering and creating a sense of “being pushed forward” during operation. They preferred the subtle transition animations in NetEase

Music when switching songs or playback modes, considering such designs to offer a natural sense of flow that helps sustain the emotional state during listening. Additionally, Chinese users expressed high approval of the rich feedback provided in NetEase Music's micro-interactions, stating that these details imbue operations with a sense of "accomplishment" and emotional involvement.

In contrast, Western users gave positive feedback on Spotify's concise and straightforward style of micro-interactions. They found that the instant feedback during playback control and favoriting actions—such as button color changes and brief text prompts—made the operational flow highly clear without being distracted by unnecessary visual effects. While testing NetEase Music, they generally found the animated interactions "interesting," but felt these animations interrupted the rhythm during consecutive tasks, diminishing the sense of efficiency. Especially in tasks involving search and playing recommended songs, Western users preferred Spotify's way of simply presenting personalized recommendations at the bottom of the main interface. In comparison, they felt overwhelmed by NetEase Music's complex layout and embedded social content, which they believed increased the cognitive load in completing goal-oriented tasks.

Overall, Chinese users care more about the emotional richness and ritualistic feel conveyed through micro-interactions, whereas Western users prioritize micro-interactions that accelerate task flows and maintain interface clarity.

Interface Comprehension

In interface comprehension, Chinese and Western users demonstrated different adaptation characteristics upon first encountering the other platform.

Chinese users generally adapted quickly to basic operations in Spotify, but when it came to functions like switching playback modes (e.g., repeat, shuffle) and the favoriting feature, some users failed to immediately recognize the specific meanings of the buttons due to differences in interaction logic and icon design compared to NetEase Music. Furthermore, when dragging the progress bar, Spotify provided no additional informational prompts (e.g., timestamp pop-ups or lyric interface cues), making some Chinese users feel the operation lacked intuitiveness and required repeated confirmation. They preferred to find more visible cues on the interface to support action confirmation.

By contrast, Western users felt a higher cognitive load when first using NetEase Music due to the large amount of information and social feature entries (e.g., comment and share buttons) present on the interface. When attempting to find the lyrics view, most users failed to locate it at first because NetEase embeds the lyrics function in the playback screen through tap-anywhere triggers instead of explicit buttons. Moreover, the process of removing a song from a playlist involves

multiple steps (e.g., selecting the playlist, confirming deletion), which Western users considered “not straightforward” and containing redundant procedures. Overall, Western users are more accustomed to a clearly structured, function-first interface layout, while Chinese users are more adept at adapting to interfaces embedded with emotional and scenario-based design elements.

Emotional Response

There were significant differences between Chinese and Western users in how various micro-interactions triggered emotional experiences.

Chinese users found that the heart icon was a strong representation of the emotion of “liking,” and in NetEase Music, actions such as favoriting or liking comments were generally accompanied by immediate visual effects (e.g., heart icon pulsing, subtle flashing animations), which created a “positive emotional” experience. They felt the operations were “acknowledged.” In contrast, when using Spotify, the favoriting function’s symbol lacked any meaningful association with the concept of “liking,” leading not only to confusion during first-time use but also to a disconnect from emotional expression.

Western users generally described Spotify’s nearly interference-free and concise feedback style as “efficient” and “non-disruptive,” giving it high emotional ratings. However, when encountering the rich animations in NetEase Music’s micro-interactions such as favoriting and liking, they also experienced emotional resonance. Many expressed surprise and appreciation for the design of the heart icon and the vinyl record animation, but they did not consider this a core part of the overall experience.

In summary, Chinese users are more sensitive to emotional wrapping during operations and value subtle emotional resonance. Western users, however, are emotionally guided by task continuity and do not believe emotional cues should be overly involved in interaction design.

Explanations

When explaining the reasons behind their preferences, Chinese users commonly mentioned the influence of “habits” and “usage scenarios.” They believed that using a music app in daily life was not solely for listening to songs but also for extending emotional states during listening. Therefore, they were more receptive to a certain degree of emotional rendering in the interface. Especially in a cultural context that emphasizes personalized and social experiences, the emotional feedback provided by micro-interactions becomes a tacit expectation. Several Chinese users commented, “Using NetEase feels like being accompanied.”

Western users, on the other hand, repeatedly emphasized the need to “efficiently complete tasks” when explaining their preferences. They viewed the app as a tool-oriented product and believed micro-interaction design should prioritize minimizing interference and enhancing the main task. Thus, any design that deviates from the main task flow and increases cognitive load, even for emotional purposes, is easily categorized as “unnecessary complexity.” One user directly stated, “If I want to socialize, I won’t do it while listening to music. I need to find and play music quickly.”

Overall, the preferences of Chinese and Western users are rooted in different usage expectations: Chinese users tend to seek a dual experience of “emotional resonance + task completion” through micro-interactions, whereas Western users view micro-interactions as “task-oriented + efficiency-first” auxiliary tools, where emotional elements should not act as distractions.

4.3 Cultural Reflections

This section interprets the observed micro-interaction differences between Spotify and NetEase Music through the lens of Hofstede’s cultural dimensions and High & Low-context communications. By triangulating the interface analysis and user feedback, researcher uncover how these applications align with distinct cultural values and user expectations in their respective markets.

4.3.1 Individualism vs. Collectivism

Hofstede (2001) points out that Western cultures (such as Finland and Sweden) are highly individualistic, while Chinese culture tends to be collectivistic. This cultural dimension is particularly evident in users’ micro-interaction experiences regarding social interaction and sense of content belonging.

In the social interaction task, Spotify users are required to create and share a collaborative playlist. Test data show that Finnish and Swedish users generally stated that this function aligns with their habit of “independently choosing social relationships.” They prefer inviting specific friends to collaborate on playlists, emphasizing individual control, and tend to limit sharing behaviors to a small, private circle.

In other side, Chinese users showed a stronger willingness for public participation in NetEase Music’s comment liking interaction feature. In interview feedback, several Chinese participants mentioned that NetEase provides a “space to feel others’ emotions” and “find resonance,” and this open form of mass social interaction felt familiar and natural to them.

Therefore, it can be seen that NetEase Music's social micro-interactions better align with the collectivist cultural needs for "group belonging" and "emotional resonance," while Spotify's social design reflects the individualist culture's emphasis on "relational autonomy" and "privacy control."

4.3.2 Long-Term vs. Short-Term Orientation

Chinese culture is characterized by a strong Long-Term Orientation, emphasizing long-term goals and continuous accumulation, whereas Finnish and Swedish cultures tend to be more Short-Term Oriented, focusing on immediate experience and current satisfaction.

In the personalized recommendation experience, NetEase Music prefers to use a "music listening behavior cultivation system," encouraging users to optimize recommendation accuracy through long-term accumulation; It even provides feedback mechanisms such as "Listening Radar" and "Annual Music Reports." Chinese users generally expressed that they enjoy this "the more I use it, the better it understands me" feeling.

Spotify, on the other hand, focuses on capturing immediate interests and quick matching. Even new users can receive relatively accurate recommendations after a short period of use. Finnish and Swedish users reported that they expect to "immediately get good content" rather than rely on long-term cultivation.

Thus, NetEase Music's focus on long-term cultivation of user preferences aligns with the Long-Term Oriented culture's expectations for future rewards, while Spotify's emphasis on instant gratification fits the Short-Term Oriented culture's focus on the value of current experiences.

4.3.3 Uncertainty Avoidance

The Uncertainty Avoidance Index reflects a culture's tolerance for ambiguity and the unknown. Chinese culture shows a relatively high tendency to avoid uncertainty, whereas Finnish and Swedish cultures exhibit a higher acceptance of it.

In the personalized recommendation and search tasks, NetEase Music includes various auxiliary elements in the recommendation results, such as song popularity labels, number of user reviews, and editorial recommendation comments. These elements provide users with additional clues, helping them feel more secure during the decision-making process. Chinese users reported that these prompts "help find the song I want faster" and "avoid trial and error."

In contrast, Spotify's personalized recommendations are extremely restrained, with the recommendation list consisting only of album covers and titles, lacking excessive auxiliary information. Finnish and Swedish users generally stated that this approach of "directly pushing content without

interfering with choice" aligns more with their expectations, expressing that they are "willing to explore on their own" and "do not need extra prompts."

Therefore, NetEase Music reduces user anxiety during selection through rich prompts, meeting the psychological needs of high Uncertainty Avoidance cultures; while Spotify maintains a simple and ambiguous recommendation interface, better matching low Uncertainty Avoidance cultures' preference for freedom and openness in exploration.

4.3.4 High-context vs. Low-context Communication

According to Edward T. Hall's (1976) theory of cultural communication, the level of context determines the extent to which people rely on "explicit information" versus "implicit information" in communication.

Users from low-context cultures targeted by Spotify (such as Finland) prefer clear, concise, and emotion-free information expressions. Accordingly, its micro-interaction design emphasizes a minimalist interface and intuitive functionality, avoiding redundant guidance. For example, the lyrics interface is clean and restrained, social features are subtly hidden, and micro-interaction buttons use standard icons rather than emotionally suggestive prompts. This design logic respects users' independent decision-making rights, aligning with low-context cultures' communication preferences for "information minimization" and "self-paced interaction."

NetEase Music serves users from high-context cultures (such as China), with micro-interaction design focusing more on conveying information through emotional cues and community atmosphere. Elements such as lyric background, dynamic comments, and skeuomorphic feedback are used to construct implicit guidance and emotional resonance, encouraging users to engage actively. Chinese users also tend to derive emotional perception and usage motivation from others' comments, reflecting high-context cultures' reliance on "atmospheric perception" and "relationship-driven" communication.

Overall, the significant differences between Spotify and NetEase Music in context adaptation clearly demonstrate how design aligns with users' deep cultural expectations regarding "how information is received and understood."

5 Discussion

This chapter provides interpretation and in-depth discussion based on the data results presented in the Results & Findings. Cultural theories are used to analyze the cultural adaptability insights behind the micro-interaction differences.

5.1 Interpretation of the Results

The comparative analysis revealed clear differences in how Spotify and NetEase Music approach micro-interaction design. These differences can be understood not only as design choices, but as cultural adaptations shaped by the expectations and preferences of their primary user bases.

5.1.1 Micro-interaction Differences and Cultural Adaptation

Spotify's micro-interactions are characterized by functional minimalism, efficiency, and user autonomy. Features such as seamless song search, simple playback controls, and straightforward playlist management reflect a function-oriented approach. Users are given maximum freedom to explore and control their music experience without excessive system intervention. This aligns strongly with individualistic cultures (Hofstede, 2001), particularly the Western cultural sphere, where autonomy, personal choice, and goal-oriented behaviors are highly valued.

In contrast, NetEase Music emphasizes emotional engagement and community interaction. The app's micro-interactions often include rich visual feedback, layered options for interaction (such as likes, comments, and reposts on music tracks), and encouragement of user-generated content. These design choices reflect a relationship-oriented and emotion-driven approach, resonating with collectivist cultures such as China's, where social bonds, emotional expression, and group belonging are central cultural values.

This divergence is not merely theoretical but is reflected in user feedback collected during the testing phase. Spotify users appreciated the app's simplicity and speed, emphasizing the importance of "getting things done quickly without distractions." Several participants praised the intuitive search function and minimalistic playback interface, which allowed them to control their listening with little friction. In contrast, NetEase Music users valued features like the comment section and personalized recommendation notes, describing them as making the music experience "more alive" and "emotionally rich." One participant noted that reading comments was "almost as enjoyable as listening to the song itself," highlighting the depth of social interaction expected by the user base.

The interface strategy thus also reflects different assumptions about users' needs:

- Spotify trusts users to navigate independently, offering minimal guidance beyond what is necessary.
- NetEase Music anticipates a desire for more structured, emotionally resonant interactions, proactively guiding and inviting users to participate socially.

This fits into broader high-context versus low-context communication theories (Hall, 1976). Spotify operates in a low-context manner, with clear, explicit functions requiring little social or contextual interpretation. NetEase Music embraces a high-context design, embedding social meaning and emotional nuance into even basic actions like liking or sharing music.

Furthermore, interaction depth and social needs show cultural contrast. Spotify treats music listening as a personal, somewhat private activity, consistent with cultures where individual achievement and privacy are emphasized. NetEase Music turns music consumption into a shared social experience, fitting a collectivist orientation where community belonging, and shared emotion are key drivers.

In summary, the observed micro-interaction differences — function-oriented autonomy versus emotion-driven socialization — are not random but are carefully attuned to the cultural profiles of the platforms' primary audiences. This cultural sensitivity is validated both through interface analysis and user feedback, demonstrating how micro-interactions can subtly but powerfully localize user experience.

5.2 Insights for UI/UX Design

The findings of this study offer important insights for designers working on music applications — or any digital product — in multicultural or globalized environments.

First, cultural adaptability at the micro-interaction level is crucial. Users from different cultural backgrounds perceive information expression, interaction guides, and emotional tones in significantly different ways. When designing international products, designers should adjust the density of information, prompt styles, and emotional expressions in the interface based on the communication style of the target culture (e.g., high-context vs. low-context), in order to avoid communication breakdown or a disjointed user experience.

Secondly, the balance between user autonomy and platform guidance should be flexibly adjusted based on cultural background. In cultures that emphasize individualism and low-context communication, design should respect users' decision-making autonomy and minimize excessive intervention or emotional manipulation. In contrast, in cultures with strong collectivist and high-context

characteristics, atmosphere-building, social cues, and implicit recommendations can be used to enhance users' sense of belonging and willingness to participate.

Thirdly, the design of social micro-interactions should be localized according to cultural cognitive differences. As this study shows, Western users prefer small-scale, controlled interactions, while Eastern users tend to favor open, emotionally resonant community participation. Therefore, when expanding social features in cross-cultural products, designers should fully consider cultural differences in social relationship density, openness, and privacy management.

Lastly, micro-interactions, as subtle emotional connectors, are key touchpoints in building user identification across cultures. Through refined animation design, thoughtful information guidance, and culturally resonant interaction models, products can form deeper emotional bonds with users beyond functionality, thereby enhancing user retention and brand loyalty.

5.3 Limitations and Suggestions for Future Research

This study has several limitations. First, the sample size for user testing was relatively small, which may limit the generalizability of the findings. Expanding the participant pool to include a more diverse range of users across different ages, professions, and geographic regions would strengthen the validity of future research. Second, the analysis focused exclusively on the iOS versions of the apps, without considering Android or web-based platforms. Different platforms may employ distinct micro-interaction patterns, potentially affecting user experience and cultural adaptation strategies.

For future research, it is recommended to:

- Broaden sample diversity, including users from varied cultural and demographic backgrounds.
- Expand the scope beyond micro-interactions to explore how visual design, information architecture, and content strategy also reflect cultural adaptation.
- Examine dynamic cultural shifts, such as the impact of globalization and digital convergence on local user preferences, especially among younger generations who may exhibit hybrid cultural traits.

Through these extensions, a more comprehensive understanding of cross-cultural UX design could be achieved, providing deeper guidance for global digital product development.

6 Conclusion

This study conducts a task-oriented interface analysis and collects user testing feedback on the micro-interaction design of Spotify and NetEase Music. By applying cross-cultural theories such as Hofstede's cultural dimensions and Hall's context model, it identifies notable differences in how the two applications adapt to cultural expectations. These differences are not only reflected in visual presentation and functional interaction, but also reveal deeper responses to varying cultural mindsets and behavioral patterns. The key differences can be summarized in the following five areas:

First, in terms of information delivery, Spotify tends to adopt a direct and explicit communication path, whereas NetEase Music places more emphasis on contextual rendering and emotional atmosphere.

Second, in user interaction approaches, Spotify highlights user autonomy and control, while NetEase users are more accustomed to context-based participation guided by platform cues.

Third, regarding social interaction, Spotify users prefer small-scale, private collaboration, while NetEase users are more likely to seek emotional resonance and group identity through public comment sections.

Fourth, in guidance and feedback strategies, Spotify supports a more open-ended exploration experience, while NetEase relies more heavily on explicit prompts and visual cues to direct user behavior.

Finally, the two platforms differ in how they construct their relationship with users: Spotify acts more like a "tool-providing companion," whereas NetEase Cloud takes on the role of an "actively engaging server."

In summary, micro-interaction design is not merely a matter of interface presentation, but a way of interactive expression deeply embedded within cultural contexts. Spotify, through a minimalistic, individually, and emotionally neutral style of micro-interactions, caters to the needs for freedom, efficiency, and direct communication found in cultures characterized by low uncertainty avoidance, short-term orientation, individualism, and low-context communication. NetEase Music, on the other hand, aligns with users' preferences for guidance, group belonging, and emotional resonance in Chinese cultures marked by high uncertainty avoidance, long-term orientation, collectivism, and high-context communication, through rich visual, highly guided, and emotionally expressive micro-interactions.

6.1 Practical Implications

While Chapter 5.2 detailed the design insights for UI/UX, this chapter summaraizes the overall practical implications. This study shows that micro-interaction design in cross-cultural digital products not only serves a functional role but also acts as a crucial medium for cultural adaptation. Designers should flexibly adjust interface information hierarchy, guidance methods, and emotional rendering strategies based on cultural differences in how people perceive information delivery, user autonomy, and social relationships. By carefully refining the details of micro-interactions, products can better achieve cultural resonance and enhance both user experience and emotional identification across global audiences.

Moreover, while this study focuses on the relationship between micro-interaction design and cultural adaptation, the findings may also offer broader implications for sustainable product strategies. When digital platforms effectively align with the cultural expectations and interaction preferences of their target users, they not only enhance immediate usability but also foster long-term user loyalty and engagement. In this sense, cultural adaptation serves not merely as a localized optimization, but as a strategic approach to sustainable growth. Platforms that respect cultural diversity in design and demonstrate social responsibility in values are more likely to achieve a balance between commercial success and long-term impact in an increasingly globalized digital environment.

6.2 Scientific Implications

This study not only validates the cultural adaptation trends in micro-interaction design between Chinese and Western music applications but also proposes an analytical framework: starting from concrete interface design, progressing through user perception and preference feedback, and finally leading to generalizable cultural adaptation principles. These findings offer practical implications for future interface design of music platforms and digital products in multicultural contexts, while providing UX research with a novel "micro-interaction–culture" nexus perspective.

6.3 Personal Reflections

This thesis, conducted from February to May 2025, deepened my understanding of cultural adaptation in digital interface design. While I initially assumed cultural differences mainly affected visual styles, the comparison of micro-interactions between Spotify and NetEase Music revealed how deeply cultural values shape subtle interaction logic.

The literature review phase proved most challenging (occupying 40% of total time), as it required integrating two distinct domains: Nielsen's classic UX principles with several cultural studies.

Though some theories date back to the 1990s, their foundation in unchanging human behavior patterns ensured relevance.

Through systematic comparison, I learned three key lessons: First, cultural adaptation in design requires understanding both explicit preferences and implicit behavioural logic. Second, widely accepted theories can effectively guide new research contexts if their core premises remain valid. Third, minor interaction details collectively create culturally resonant experiences, even when individual differences seem negligible.

These insights will inform my future work as a digital service designer, particularly in balancing universal usability standards with localized cultural needs.

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Appendices

Appendix 1. Micro-interaction Comparison Table – Search & Result Interface

1. Search interface and Result Display		
Dimension	Spotify	NetEase Music
Trigger	On the homepage, tap the “Search” icon in the bottom navigation bar to enter the search interface. Tap the search bar at the top, the keyboard pops up automatically, and recent searches are displayed. After entering the query, tap “Search” on the keyboard to view results.	On the “Recommendation” page (accessed via bottom navigation), tap the search bar at the top to enter the search interface. Search can also be triggered from multiple other scenarios such as the “Discovery” page or user profile page, typically via tapping a magnifying glass icon. Similarly, enter song information in the search field and tap the search key on the keyboard or the icon on the right side of the bar to initiate search.
Rules	Real-time suggestions are updated based on input keywords, covering categories such as songs, artists, albums, and podcasts. English spelling corrections are supported. For free-tier users, certain songs may appear in results but are not playable.	Real-time search suggestions and content categories (e.g., Singles / Artists / Albums / Videos) are displayed simultaneously. Mixed-language input (e.g., Simplified & Traditional Chinese) is supported. Most results can be directly played or accessed in detail pages (except in cases of copyright or regional restrictions).

Feedback	Upon entering the search interface, only recent search history is shown. During search, the background darkens to highlight the input area, and character input triggers real-time predictive suggestions. No loading animation is shown while waiting for results. Search results are displayed in modular card layouts, showing album covers or artist images by default. If a song has already been added to a playlist or liked, a green check mark appears on the right of the track. After tapping a result, the song title turns green, and the song is played immediately.	Entering the search interface brings up search history, personalized recommendations, and trending search charts. During input, predictive suggestions appear in real time. While loading results, an animation is displayed showing “Loading” text with red waveform visual effects. Each suggestion highlights keywords in bold. Results are categorized by type, with “Singles” shown by default. No images are shown. Track entries include artist name, album title, and sometimes labels such as “Recently Played,” “Highly Commented,” or “Most Liked.” If the track has been added to a playlist or liked, a heart icon appears next to it.
Loop & Modes	Search behavior influences future personalized recommendation algorithms.	Search actions are also used to train the recommendation model. Search habits can influence trending searches and the generation of personalized playlists.

Appendix 2. Micro-interaction Comparison Table – Personalized Recommendation

2. Personalized Recommendation System & Interface		
Dimension	Spotify	NetEase Music

Trigger	On the Home page, personalized recommendations are automatically displayed based on the user's listening history. Examples include: "Your Favorite Artists" (artists of interest) "Your Top Mixes" (recommended music style mixes) Album suggestions related to liked songs. Personalized playlists such as "Daily Mix" and "Discover Weekly" under the "Made for You" section.	Upon entering the Recommendation page, personalized content is also presented by default. Examples include modules such as: "Daily Recommendations," "Private Roaming," "Personal Radar," etc. These modules can be swiped horizontally to explore more content or tapped to enter. There are also single-track recommendation lists like "You Might Like," "Recommended Based on Songs You Love," and "Recently Listened." Tapping a song starts playback instantly.
Rules	Recommendations are based on multiple indicators, including listening history, favorites, search activity, artist and genre similarity, and even geographic location. Recommendations are refreshed weekly, following a preset update cycle without requiring users to manually set preferences.	User behavior triggers background algorithm updates. The recommendation system learns from browsing history, listening habits, device data, social following, order history, etc. Users can optimize recommendations through feedback actions, such as "Recommend more like this" or long pressing to mark "Not Interested." Additionally, users can turn off "Personalized Services" in settings, which reduces the amount of relevant content shown.
Feedback	The Recommendation page contains clearly labeled sections, mostly categorized by playlist. Each playlist has	Recommendations are also categorized and marked with their source. Most recommendations are

	an “About Recommendation” section showing more specific reasons for recommendation. Visual layout remains image-driven, using large thumbnails and album covers.	in the form of individual tracks, displaying the song cover, title, and artist name. Tapping a recommended track triggers instant playback, with a visual waveform animation next to the currently playing item. If the user gives positive or negative feedback on a song, the system updates the recommendation in real time and switches to a new track, displaying feedback like: “Thanks for your input. This song will no longer be recommended.”
Loop & Modes	The recommendation mechanism forms a closed feedback loop with user behavior: the more users listen, the more accurate the recommendations become. Spotify does not offer recommendation mode switching; the recommendation area is a distinct and stable interface with consistent interaction logic.	Users can enter “Private FM” mode to enable continuous recommended playback (a specific recommendation mode). The system also allows switching between recommendation styles such as “Heartbeat Mode” or “Cloud Hot Songs,” with more explicit interactive guidance and control.

Appendix 3. Micro-interaction Comparison Table – Play/Pause

3. Play/Pause		
Dimension	Spotify	NetEase Music

Trigger	Tapping the “Play” or “Pause” button in the playback bar or playback screen triggers the action. On other pages, tapping anywhere on the target song triggers playback. It also supports multiple input methods such as headphone controls and the control center widget.	Similarly, on both the playback bar and playback screen, tapping the button triggers the action. On other pages (such as the recommendation or discovery pages), tapping the target song will also trigger playback. Multi-device sync, widgets, and wired headphone controls are also supported.
Rules	After the user taps, playback or pause takes effect immediately. However, the playback screen does not automatically expand; it needs to be entered manually.	Also offers instant response. If not triggered from the playback page, users must manually tap the playback bar to enter the playback screen. However, if the song is selected from a playlist, the playback screen will automatically expand. If the song is restricted due to copyright, a pop-up message will indicate it cannot be played, and the play button will be disabled.
Feedback	The playback icon updates immediately with no additional visual effects. When paused, the music stops instantly. By default, the playback interface displays a static square album cover, but for some songs, a dynamic video visual (typically a looped MV clip) is shown. However, this MV animation continues playing even when the music is paused—it is not synchronized with the playback status. (This feature can be toggled in settings.) Additionally, when using headphone controls to	Feedback is similarly shown via icon change, but the primary visual feedback involves animation effects. The main playback screen features a vinyl record design: a circular disc displays the album cover and spins while music plays. When paused, the record stops spinning and the tonearm lifts. When pausing, the music fades out slightly, with a ~0.5-second delay before complete silence.

	play/pause, an audio feedback sound is triggered.	
Loop & Modes	If the app is minimized, playback continues in the background. However, switching to a video playback app will pause the music.	Background playback is also supported, but it is similarly interrupted by video playback apps. Additionally, if the network connection is unstable, playback will automatically stop.

Appendix 4. Micro-interaction Comparison Table – Song Switching

4. Song Switching (Next/Previous Song)		
Dimension	Spotify	NetEase Music
Trigger	- Option 1: Tap the “previous/next” buttons on playback page. - Option 2: Use gestures – swipe horizontally across album cover (left swipe to the next one, right swipe to the previous). - Also supports headset buttons, car controls, and multi-device linkage.	- Option 1: Tap the “previous/next” buttons on playback page. - Option 2: Same gesture support – horizontal swipe. - Also supports Bluetooth devices, voice control, etc.
Rules	- Supports skipping forward/back, the track for the switched song picking depends on playback mode. For instance, in shuffle mode, skipping randomly jumps. - Non-Premium users are limited to the times of skip, and are only allowed to switch to the next song	- In normal playback mode, the logic for switching songs is clear. - If it is “Daily Recommendation” or “Private FM”, clicking “next” will jump to algorithm-recommended content.

	- Skipping resumes playback automatically (even in pause mode).	- Similarly, after switching songs, the new song plays automatically, regardless of the current playback mode.
Feedback	- After switching, the progress bar slides, and the track information is updated smoothly. - There is a slight animation on the page – the whole screen slides horizontally – and the switching speed can follow the user's finger movement speed (when the screen is held down without releasing). Meanwhile, during the transition state, the cover of the next track can be seen. - Response speed: The next song starts playing immediately after switching, with no delay.	- The interface information also updates smoothly. - The page animation consists of the tonearm moving to the right (meaning lifted), then the record cover sliding horizontally to the next track. The switching speed can also follow the user's finger movement speed, and during the transitional state (sliding the screen while holding it down), the cover of the next track can be observed. - Response speed: After switching, playback is slightly slower than on Spotify, giving a sense of "fade in and fade out" in hearing.
Loop & Modes	This interaction is an immediate, one-time triggered feedback behavior, which does not involve changes to system status or continuous running mechanisms. Therefore, this dimension is not included in the analysis.	

Appendix 5. Micro-interaction Comparison Table – Lyrics & Progress bar

5. Lyrics interface and Progress bar dragging		
Dimension	Spotify	NetEase Music
Trigger	Lyrics interface: Pull down (slide finger upwards) on the playback interface to find the lyrics section, click the “enlarge” icon to trigger the lyrics interface. Progress bar: Drag the slider on the progress bar in the playback or lyrics interface to adjust the song progress; clicking on any lyric line can also trigger progress jump.	Lyrics interface: Tap any area of the playback interface to trigger the lyrics interface; tap again to switch back to the default vinyl record playback interface. Progress bar: Users can drag or click anywhere on the progress bar to trigger a progress jump. When users scroll through the lyrics and click the tiny “play” button next to the target lyric line, it also triggers playback jump.
Rules	Lyrics interaction: The playback interface and “full-screen lyrics interface” are separate sections. The full-screen lyrics interface cannot perform operations such as switching playback modes or songs; it is only related to lyrics. It is also possible not to trigger the full-screen lyrics; the mini lyrics box can be viewed by scrolling down (this app’s playback interface is not fixed based on the device used). Note: The provision of lyrics is limited and depends on whether the	Lyrics interaction: The playback interface and lyrics interface belong to the same section; a single tap is enough to “switch” between them, and all other control buttons on the playback interface are fully retained. (This app’s playback interface is fixed, and the size ratio is based on the device used.) Additionally, if the song is in a foreign language (non-Chinese), the lyrics are usually localized, meaning translated into Chinese and displayed together with the original lyrics. (Users can trigger this display via a button icon.)

	user is a member, or the song has copyright authorization. The provided lyrics are in the song's original language, with no translation processing. Progress bar: Dragging the slider or clicking on any lyric line can locate to the specific timestamp. Audibly, the music does not have a "cut-off" feeling, and the audio track transitions naturally. The start and end times of the progress bar both change as the song plays: the start begins from 0:00 and increases with playback, while the end shows a negative sign in front of the song's full length and decreases during playback.	Progress bar: Dragging the slider or clicking anywhere on the progress bar allows for automatic jump to the corresponding timestamp. The track jump has a slightly choppy auditory effect. Only the beginning of the time axis increases with playback, while the end always displays a fixed time (i.e., the total duration of the song). Also, besides the "progress slider" circular point, there is another circular point on the progress bar, which is non-draggable and used to mark the chorus section of the song. When the user drags the slider past this marker point, a haptic vibration feedback is triggered.
Feedback	Lyrics: After clicking the "enlarge" icon on the mini lyrics interface, the full-screen lyrics float up and expand. The lyrics scroll line by line in sync and highlight as they go. Progress bar: During dragging, the current and target timestamps appear. The slider moves smoothly, with only the slider itself having a slight dynamic zoom feedback. While dragging, the lyrics scroll simultaneously (the mini lyrics interface doesn't do this; it jumps directly to the target lyrics only after dragging	Lyrics: During playback, the lyrics scroll word by word in sync, with visual feedback being word-by-word highlight fading. If interactive lyrics trigger a jump, the highlight locates accordingly, and playback catches up instantly. If the song is not in Chinese and the "translation" feature is triggered, the lyrics are displayed bilingually. Progress bar: When dragging the slider, both current and target time are shown. The

	stops). After dragging, the playback progress updates instantly.	progress bar and slider present dynamic zoom feedback as a whole. The lyrics do not scroll in sync during dragging; they only jump and reposition after dragging stops, and the lyrics jumping animation is smooth. For progress adjustment through lyrics, when the user scrolls up and down through lyrics, a horizontal line gradually appears in the middle of the screen. On the left of the line is the timestamp of that lyric line, and on the right is a "play" icon. When the target lyric line is slid to this line, a rectangular animation appears around it. At this point, clicking the play icon will randomly jump the playback.
Loop & Modes	Both lyrics and progress bar interactions are immediate actions and do not involve this dimension of analysis.	

Appendix 6. Micro-interaction Comparison Table – Playback Mode

6. Playback mode switching – Loop / Repeat / Shuffle		
Dimension	Spotify	NetEase Music
Trigger	By tapping the "loop" icon on the playback screen, the user triggers loop all	Similarly, tapping the icon on the playback screen switches

	mode; tapping it again switches to repeat one. The shuffle icon is located on the other side of the screen and is triggered separately.	between the three modes. The three icons are located at the same position and change in a fixed sequence with each tap.
Rules	“Loop all” and “repeat one” modes toggle in a fixed sequence at the same icon location. The shuffle mode is activated via a separate icon located on the other side of the play button. If no mode is manually selected, the default is loop all. However, when playing a song from the “Recommended Track” list, the playback mode switch becomes inactive. Additionally, non-premium users face restrictions — shuffle mode becomes the default and cannot be changed; other modes are inaccessible.	The three modes switch in a fixed sequence (Loop All – Repeat One – Shuffle). Users can freely switch between modes without subscription restrictions. Moreover, NetEase Cloud Music offers unique modes such as “Heart Mode” and “Personal FM,” which are algorithm-based and dynamically change playback rules.
Feedback	Icon shape changes (loop arrow, number one, crisscrossed arrows) indicate the current playback mode. The icon color shifts from white to green, and a small green dot appears below to further signify the active mode.	The icon changes in the same order (loop arrow, number one, crisscrossed arrows) to indicate the current mode. Unlike the previous case, each mode switch also triggers a text feedback — a brief mode label appears in the center of the screen for about 1 second to notify the user of the change.
Loop & Modes	Each mode represents a continuously running playback logic that directly affects the queue behavior. Switching modes takes effect immediately and influences all subsequent microinteractions like “play” and “skip.”	More diverse playback options are available, including “Heart Mode” and “Personal FM,” which are triggered through specific pathways. Loop all and shuffle in these special modes are deeply

	However, since the shuffle icon is not located in the same place as loop all and repeat one, users may accidentally activate multiple modes. In Spotify, shuffle mode takes precedence over the others by default.	integrated with the app's recommendation algorithms. Switching to these special modes can also change the overall layout of the playback interface.

Appendix 7. Micro-interaction Comparison Table – Song Liking

7. Like a song / undo		
Dimension	Spotify	NetEase Music
Trigger	- On the playback or list page, tap the "+" icon to like. - On list page, swipe left to trigger like. - To undo "unlike": tap the changed icon twice → enter the pop-up info box → tap "Done" to finish.	- Option 1: Tap the "heart" icon on playback page. - Option 2: Double tap anywhere on the playback page (except other icon areas) to like. - To unlike: tap the heart icon again.
Rules	- The liked song will add to "liked songs" playlist automatically. - If undo the operation, the song will be removed from "liked songs" playlist. The undo process involves a longer interaction path.	- After liking, the target song is added to the "Liked Musics" playlist automatically. Same, the operation "undo" will delete the target song from the playlist. - Whether liked or not, the upper-right of the heart icon always shows like count from other users (e.g. 10w+ means over 100k user likes).

Feedback	- The “+” icon becomes a “checkmark” and turns green from white; a “congratulations” animation appears (0.5s) around the icon. Simultaneously, a text prompt “added to liked songs” shows at bottom. - In list page, a green “checkmark” tag also shows on the right side of the targeted song bar. - Unlike feedback: Tapping green “checkmark” will trigger the playlist Info box pop-up → tap the “checkmark” icon again and tap “Done” in the pop-up page → a text prompt“removed from liked songs” appears at bottom.	- Heart turns full-filled red color, accompanied by a flashing effect. 2 seconds later, top banner shows “added to liked music.” - Double tap shows an animated big heart and flashing on screen center. - After unlike: icon returns to default (white hollow heart), immediately, text feedback "Like Cancelled" pops up at the top.
Loop & Modes	“Liked” behavior affects recommendation algorithm.	“Liked” behavior has strong influence on personalized recommendations; system interprets as input for preference learning.

Appendix 8. Micro-interaction Comparison Table – Add/Remove to Playlist

8. Add and remove songs to the playlist		
Dimension	Spotify	NetEase Music
Trigger	On the playback screen, tap the three-dot icon in the upper right corner to open the extended menu. Tap “Add to playlist,” select the	Similarly, on the playback screen, tap the three-dot icon at the bottom right to open the extended menu. Tap the “Favorite” icon, then select

	target playlist, then tap “Done” to complete the action. Alternatively, this can also be triggered from the list page via the same three-dot icon. To remove: On the playback screen or playlist page, tap the three-dot icon and choose “Remove from this playlist,” or go to the playlist page, tap “Edit,” then tap the minus (“-”) icon next to the song, and finally tap “Save” to confirm.	the desired playlist to add the song. This can also be done by tapping the three-dot icon next to the song in the list page. To remove: On the playlist list page, tap the three-dot icon next to the song, scroll to the bottom of the pop-up menu, tap the “Delete” icon, and confirm by tapping “Delete” again. Alternatively, tap the “Manage Playlist” button, select the song, tap the trash bin icon at the bottom right, then choose “Remove from playlist,” and finally tap “Done.”
Rules	Once triggered, the song is immediately added to the selected playlist. Users are allowed to add a song to multiple playlists and can also remove songs from the playback screen.	Similarly, users can select multiple playlists. If the song already exists in a playlist, a message like “Already added” will appear to avoid duplicate additions. However, at present, songs can only be removed via the playlist page, not from the playback screen.
Feedback	After selecting “Add,” a playlist selection window pops up. Clicking on a playlist will display a green checkmark next to it. Once the user taps the “Done” button, the window closes and a bottom banner appears saying “Added to playlist,” displaying the specific playlist name. To remove: After selecting “Remove from playlist” in the song	After tapping the “Favorite” icon, the playlist selection window pops up. Tapping a playlist immediately completes the action, and a loading icon appears briefly, followed by a top banner saying, “Added to playlist,” along with a red checkmark. However, the playlist name is not shown. If the user wants to add the song to multiple playlists, they can tap the “multi-select” icon in the playlist window. After selecting multiple

	management pop-up menu, a banner appears at the bottom saying "Removed (song-name) from playlist," showing both the song and playlist name.	playlists, a red circular checkmark appears next to each one. The bottom "Add to playlist" button will display the number of selected playlists. After tapping this button, a 1-second loading animation appears in the center of the screen, followed by a top banner saying, "Added to (2) playlists." To delete: After tapping the delete icon, a confirmation dialog appears — "Are you sure you want to remove this song from the playlist?" with "Cancel" and "Delete" options. Only after confirming will the song be removed. No feedback banner is shown afterward.
Loop & Modes	User behavior of adding songs to playlists will influence the recommendation algorithm. The songs added will affect the content of recommended playlists.	Adding songs is closely tied to the "Favorites" logic. Songs that users mark as favorites or similar tracks will continuously appear in the "You might like" section. Playlists and personalized recommendations are highly interconnected.

Appendix 9. User Testing & Interview Plan

The complete user testing and interview setting can be accessed via the following link:

https://drive.google.com/file/d/1rWjdEXZVTadaGbu3NSGsci275lCIyUwf/view?usp=sharing