

Choice of Social Music Systems in China: A Study of NetEase Cloud Music

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Figure 1: Interface and main features of NetEase Cloud Music: (a) mobile app open interface; (b) homepage, [1] daily recommendation; (c) music play interface, highlight box: the number of comments under this song; (d) details of comments: [1] number of replies to under this comment, [2] number of "like"; (e) account message center: [1] followers, [2] comments, [3] mention (@) me, [4] notification, [5] private chat.

ABSTRACT

Social music is gaining popularity, but there is still little understanding of why it is popular in China. In this study, we applied mixed methods and used NetEase Cloud Music (a popular social music app) as the research platform for a preliminary exploration of user's motives and their relationship with technology acceptance and social presence. The interview study (N=21) shows that users preferred NetEase Cloud Music rather than other services because of five reasons (recommended by acquaintance, good UI design, accurate recommendation and classification system, wonderful comments and a sense of community, and user relation activities). The survey study (N=246) shows that wonderful comment and a sense of community is strongly related to social presence; good UI design

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is strongly related to ease of use; accurate recommendation and classification system is strongly related to usefulness. We discuss the practical implications for designers and the platform.

CCS CONCEPTS

• Human-centered computing → Empirical studies in HCI.

KEYWORDS

Social Music; Social Presence; Technology Acceptance; NetEase Cloud Music

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1 INTRODUCTION

Music streaming services have become increasingly popular with the rapid development of internet and mobile networking technologies. They have changed the way consumers access music and have

had major effects on the music industry [3, 4]. Downloading or listening online is an entertaining and convenient way to access music [20]. Nielsen reported that more than 70,000 different music albums were released by mid-year 2018; how to maintain users' attention and to stand out amongst the numerous works and digital platforms is critical for success [2]. As an example of "hedonic" information systems (those used for pleasure rather than work), as well as the backbone of a major industry worldwide, the reasons for the choice of a specific music streaming platform are deserving of study.

Platforms such as Spotify and Apple Music can provide only limited social interaction such as sharing and viewing friends' history [13]. YouTube Music can allow comments on videos among users, but reports show that users mainly use YouTube for search, and the interaction often happens on other social media sites [6]. NetEase Cloud Music is one of the leading social music platforms in China with a hybrid of music streaming systems and social network sites. It provides a social network through which users can be connected by following others and can post and reply to comments under each song [36]. The number of comments that users post to individual songs indicates a high-level connectedness between the platform and its users, and this phenomenon has been viewed as a miracle within the Chinese music market [1]. Some interfaces and main features are shown in Figure 1. While most research focuses on music streaming services in Europe and North America, sparse literature about social music systems in China motivated us to conduct this exploratory research to understand users' preferences related to social music systems and gain some insight into how to improve current social music system design. In this study, we applied mixed methods and asked:

- Q1. What are the motives for users to prefer NetEase Cloud Music rather than other music services?
- Q2. How do these motives contribute to technology acceptance and social presence?

2 SOCIAL FUNCTIONS OF MUSIC, MUSIC AND SOCIAL MEDIA

Existing research about listening to music can be categorized into two different topics. Early research focused on the emotional aspect of listening to music [29, 31] such as motives related to tension release, loneliness alleviation, and passing the time [11]. Later research has considered the social functions of music [17, 27], such as management of self-identity and interpersonal relationships for individuals [14]. For example, Lonsdale and North [26] found that the main reasons for people to listen to music include positive and negative mood management, personal identity, and interpersonal relationships. Music can assist listeners in organizing the ongoing stream of events that constitute their personal, social, and cultural life [18].

The social function of music can result in the formation of online communities of fans in different social media platforms such as Facebook and YouTube [35]. Social media allows artists to communicate information about their activities and events with their fans [15] and increases music sales [8]. Social music platforms, such as SoundCloud and Spotify, are exceptional spaces for independent

musicians and listeners to share their musical interests [19]. Musicians can combine different social media platforms to promote their streams and views and to boost followers [30]. Factors such as self-expression, perceived ease of use, and social presence, are associated with music sharing intentions in the social network sites [23]. Users' motivations for using the music listening application on Facebook are entertainment, communication, and habitual diversion; this supports the idea that the use of music and social media is similar [22].

Since music and social media can reciprocally influence each other [28], much research explores the social music system by separating the music streaming system and social networks sites—listening on music streaming platforms and interacting (e.g., sharing, discussing) on social media. There is less attention to listening while interacting in the same system. The relationship between social features and social connectedness across three music platforms (SoundCloud, Spotify Paid, iTunes) shows that among the features of the interaction between artists-and-user, user-and-website, and user-and-user, features related to user-to-user interaction can significantly predict social connectedness [21]. On Spotify and Tidal, users incorporate social awareness in non-sharing, selective-sharing, and all-sharing approaches with strong, weak, and absent ties [13].

3 STUDY 1

3.1 Methods

This work was approved by our institutional review board (IRB). We used semi-structured interviews to explore users' motives to use NetEase Cloud Music other than other services. We used a snowballing method to recruit participants who have used or are using this app. Four researchers (three from the United States and one from mainland China) used their social networks to send messages to Chinese contacts and asked whether they used NetEase Cloud Music. After locating four to five experienced participants, we started the interview process and asked them to refer us to their friends who were experienced users. We interviewed 21 participants (13 females and 8 males) in about three months. The interviews were about 15–30 minutes long and were conducted in Chinese through a WeChat (main social media platform in China) voice call. The interview was conducted in Chinese to facilitate communication.

We first grouped interview questions related to our first research question and analyzed the content thematically [7]. Then, we coded participants' descriptions as key concepts one by one to ensure the consistency of the coding criteria. Two researchers coded one interview question separately and compared the results to discuss any differences until they obtained consistency. Then, a single researcher performed an initial analysis by coding all the transcriptions, and another researcher reviewed the results to reach an agreement. Finally, the emergence of concepts suggested high-level themes. The qualitative analysis was completed in Chinese. Quotes in our results are presented in English and translated by one researcher and reviewed by another to ensure accuracy.

3.2 Results

3.2.1 Wonderful Comments and A Sense of Community. NetEase Cloud Music is known for the users' comments under each song.

Almost every participant in our study mentioned the comment feature. Comments functioned as a carrier of self-expression and experience sharing. Most users found the comments interesting and often followed “stories” on them. P5 told us: *“I was initially attracted to NetEase by the music comments. I remember the first comment I read; it was hilarious. Different users commented under the song, and their comments can make up a complete story.”* Comments can generate emotional resonance among users. By reading these comments, users feel like they are in a community with people like themselves. P18 knew NetEase very well and had his unique opinion towards it: *“NetEase is not only a music product but also a platform to share feelings. When I read the comments, I will have sympathy, feeling like this song is about my story. Technology may be easy to copycat, but the feelings of the comments are difficult [to copycat].”*

The Comments increased the connection and interaction, to some extent, and built a sense of community among users. P15 said that he felt like, not random people or primary school students but a group of people who understand music are using this app. In the community, users can identify people that share the same taste for music, add friends, post their comments for music, and interact with others through “likes” and comments. Both P5 and P15 gave us an example of this. For example, P15 said, *“People would feel a strong connection and interaction on NetEase. For example, you may find a good comment that was written years ago, but because his comment has a strong connection to this song or the story is impressive, people reply to it until today.”*

3.2.2 Good UI Design. Many participants reported that once they started to use it, they were attracted by the UI design and decided to continue using this application. P10 stated: *“in the beginning, I downloaded several music apps, I felt like the UI design, I mean, the interface of NetEase Cloud Music is good.”* Later, using it became a “habit,” explained P19. The clean and attractive interface makes the users feel comfortable using it, and the user-friendly interface helps the users search and save songs easily. P12 had used several music apps before, but he decided to stick with NetEase Cloud Music mostly because of the UI design: *“The interface is beautiful and clean when I use it, I will not feel uncomfortable. Moreover, when I want to search for a song, or look at the playlist, or go to my account, I can easily find where to go.”* UI design helps users to organize and share music flexibly. P11 elaborated it as: *“You can randomly create or name a playlist, just like naming a folder on a computer, one folder with many other subfolders. However, you cannot do this on Kugou Music.”*

3.2.3 Accurate Recommendation and Classification System. NetEase’s recommendation system can usually recommend their preferred music more accurately than recommendation systems of other apps (13 out of 20 participants said so). The recommendation playlist is *“based on my saving lists and what I have listened to before,”* and people are *“satisfied most of the time.”* The recommendation system can save time and energy for users and help them figure out their interests. P7 explained: *“The biggest attraction of it is that it will recommend songs that you possibly like so that you do not have to spend time and energy looking for something that you might be interested in. It is more efficient.”* P21 said: *“Searching for songs is troublesome for me. To be honest, sometimes I do not even know what my taste*

is. After listening to the recommendation list, I just found that it is a good fit for my taste.”

A music community can facilitate recommendations among users. Users can follow each other, and view others’ recommendation lists on their homepages. It is a good way for users to have common topics to discuss with friends. P6 stated: *“The difference between NetEase Cloud Music and other platforms is that it is more like a music community, it would recommend the playlists of your friends, then you can discuss and reply, kind of having more interaction.”* Similarly, P13 was a frequent user of NetEase Cloud Music and said: *“All my friends are using NetEase, it makes it very easy to share songs with them. [...] I can also go to their homepage to look at what songs my friends are listening to.”*

A good classification system helps people to find songs more easily. P11 *“felt like its classification works well.”* P3 elaborated: *“It has a lot of interesting playlists that are organized and shared by others. It is very convenient to search and find songs of a similar type.”* Similarly, P9 stated: *“If you search country music, it will show some classified playlists that, you feel, are real and connotative country music. Kugou Music has lots of songs, but the classification is bad.”*

3.2.4 Recommended by Acquaintance. NetEase Cloud Music has gained a certain reputation among users; some users prefer to use it mainly because people around them are using it. Many participants reported that they started to use NetEase because of friends’ recommendations, and they saw people around them are using it. P10 explicitly told us that he used NetEase because it is the mainstream among his friends: *“I found that NetEase is the mainstream music app now, and so I am getting used to it.”* P6 explained that it was recommended by friends, and she was also getting used to it after she saw many people were using it: *“My friend recommended me NetEase. Because people can share favorite playlists on it, and most of the lists are very good, I found many people will tend to use it more.”*

3.2.5 User Relation Activities. A customized feature of NetEase is that it can generate an annual music report for users. The report is based on users’ music preferences and listening habits. Users like it because they think the report is innovative and can help them discover facts that sometimes are hidden to themselves. P11 elaborated on this: *“The report is very interesting, it is about how many times you have listened to a song, and what was the time you used to listen to music, things like that. Moreover, I also saw my friends post their annual report on social media apps, which is very interesting.”* Similarly, P18 also pointed out the impressive activities showing how the platform cared about its users: *“It will draw an ‘image’ for you based on your listening history and ask you to share with your friends on social media.”*

4 STUDY 2

The Technology Acceptance Model (TAM) is widely used in information technology. It proposes that the intention to use a particular system is due to two factors: perceived ease of use (free of effort) and perceived usefulness (enhanced performance) [10]. The TAM model has been extensively applied in social media to evaluate users’ acceptance of technology. For example, Sim et al. [34] extend TAM to understand user’s motivation of mobile music acceptance. Social presence is defined as the degree to which users perceive

others as being present via a mediated interface [25] and communicate in a style similar to face-to-face communication [9]. More social cues (photos and text) on social media would increase perceived social presence. In this work, we intended to explore the relationship between the motives and the technology acceptance and social presence.

4.1 Methods

We used a survey to reach an extensive group of users. The English survey was developed and reviewed by four researchers. One bilingual researcher translated the survey into Chinese and another bilingual researcher, who was not familiar with the English survey, translated the Chinese survey back into English. Two researchers compared the translation differences and revised the Chinese survey to ensure the accuracy of the translation.

We used a snowballing method to recruit survey participants. Four researchers used their social networks and posted the survey on WeChat to ask their network contacts who were NetEase Cloud Music users to fill out the survey and to share the invitation with their networks. The survey took 3–5 minutes and received 292 responses in total in about two weeks. In the beginning, we asked, “Have you ever used the NetEase Cloud App?” If the participant answered “No,” that ended the survey. We removed 30 respondents’ results based on this question. We also removed incomplete responses with missing data and surveys that were completed in less than 100 seconds total because the answering time was too short to consider them valid responses. We retained 246 valid responses for further analysis.

4.1.1 Survey Measures. We adopted from Davis’s TAM to measure usefulness ($M = 3.67$, $SD = .81$, $\alpha = .91$) and ease of use ($M = 3.90$, $SD = .76$, $\alpha = .92$) [10]. We measured social presence with three items from prior work ($M = 3.21$, $SD = 1.01$, $\alpha = .93$) [12, 25]. We used single item to describe each motive: recommended by acquaintance ($M = 3.54$, $SD = 1.16$), good UI design ($M = 3.78$, $SD = .91$), accurate recommendation and classification system ($M = 3.75$, $SD = .97$), wonderful comments and a sense of community ($M = 3.72$, $SD = 1.07$), user relation activities ($M = 3.74$, $SD = .94$). All measures used 5-point-likert scale from strongly disagree to strongly agree. Items are listed in [Appendix A](#).

4.1.2 Participants Description. We had 108 males (43.9%) and 138 females (56.1%). Most participants had a bachelor’s or master’s degree (91.9%). Students accounted for 39.8%, and full-time employed participants were 52.8%. The age of participants was mainly between 18 and 34 (95.1%). Most participants have used NetEase Cloud Music for more than one year (66.6%) and listened to music for less than two hours every day (82.1%). The mobile app (93.1%) was the most popular platform to listen to. They often used multiple apps such as NetEase Cloud Music (80.1%), QQ Music (55.3%), Kugou Music (27.2%), and Xiami Music (19.5%).

4.2 Results

The regression models in [Table 1](#) show that recommended by acquaintance and accurate recommendation and classification system are positively associated with usefulness ($adjust R^2 = .25$, $F(5, 240) =$

17.41, $p < .001$); good UI design and user relation activities are positively associated with ease of use ($adjust R^2 = .30$, $F(5, 240) = 22.18$, $p < .001$); and recommended by acquaintance and wonderful comments and a sense of community are positively associated with social presence ($adjust R^2 = .29$, $F(5, 240) = 21.31$, $p < .001$).

5 DISCUSSION

Compared with the research of [16], which focused on selective sharing of music on Facebook based on different motives of self-presentation, our work started with general motives of using social music services and focused on the platform in China. The five reasons suggest the successful social music system is a good combination of socio-technical factors related to the system and platform-user relationship. The quantitative study shows how these motives are related to factors (usefulness and ease of use) of technological acceptance and social presence.

The positive relationship between motives (recommended by acquaintance and wonderful comments and a sense of community) and social presence suggests that features to improve social presence and facilitate interaction among users can be fruitfully applied to social music systems. Research shows that social engagement (e.g., retweeting and sharing of text) could increase the sense of personal presence and foster a community [25], and facilitating communication is a key element for mobile social media use intention [24]. From our qualitative results, NetEase Cloud Music users enjoyed reading the comments on songs and felt a sense of unique community there. Some features or mechanisms (e.g., customized emojis or keywords based on the song genre to enable a quick reply) to encourage these listeners to engage actively can increase social interaction and perceived social presence.

The positive relationships between motives (recommended by acquaintance and accurate recommendation and classification system) and usefulness suggest that both social and technical factors increase the perceived usefulness of the system; similarly, the positive relationships between motives (good UI design, and user relation activities) and ease of use also involve both social and technical factors. Such relationships indicate that improving both the social and technical experiences of users are critical to the acceptance of a social music system. Streaming music services lower the threshold to publish music products so that many indie artists and even music lovers can easily access and share music online, but a great deal of newly released music every day increases information overload for users to choose the music they prefer. Apparently, every streaming music service has a recommendation system. However, our qualitative work showed that many users specifically mentioned that the personalized recommendation was better on NetEase Cloud Music than on other services. Instead of mining activities of social media to better understand users’ preferences [5, 32], maybe the user-generated content (comments/reviews of songs) within the platform provided more insightful information and unique advantages to its algorithm. Prior study has gained much insight into recommendation systems but rarely explored the UI design issue for social music systems. Further research can also investigate the interface design to improve user acceptance.

Table 1: Regression Analysis

Variables	Usefulness	Ease of Use	Social Presence
Recommended by Acquaintance	.21 **	.08	.15*
Good UI Design	.00	.40***	-.01
Accurate Recommendation and Classification System	.25***	.04	.06
Wonderful Comments and A Sense of Community	.10	.01	.46***
User Relation Activities	.12	.15*	.01
<i>Adjust R²</i>	.25	.30	.29
<i>F</i>	17.41***	22.18***	21.31***

[*] $p < .05$; [**] $p < .01$; [***] $p < .001$; all β values are standardized coefficients

Prior work shows that music consumption can increase social interaction such as building friendships [33] and initiating conversation topics [20]. We found that social motives also played significant roles in the acceptance of the system, such as interaction with acquaintances and sharing personalized user reports on social media. The platform created ways to facilitate such interaction. These findings indicate that a well-designed social music system should better embody the socialization features of the platform. For example, because the user-and-user interaction can significantly predict social connectedness [21], the platform might consider applying user-generated content (e.g., comments) to form the bond among users and the tie to the platform.

There are several limitations caused by our sampling method and the mixed research method. First, the snowball sampling method may introduce sampling bias. However, since NetEase Cloud Music is not the most popular music app in the market, snowball sampling may be the best method to target active users. To minimize the sampling bias, we tried our best to ensure the representativeness of our participants during the recruitment. Second, we drew the population only from China. However, we are not sure if people in other regions would have similar preferences, so our research instruments and findings need to be replicated for a variety of systems and populations outside of China in the future.

6 CONCLUSION

In this research, we applied a mixed-method approach to explore a growing popular topic, social music. The qualitative and quantitative results show that the reasons that people prefer NetEase Cloud music and their relationship with technology acceptance and social presence: the highly useful personalized recommendation system, the interesting comments/ reviews under each song, and the community formed around these comments (giving a feeling of social presence of those who made the comments, even if they are “old”), recommendations among acquaintance (enabling social interaction with those friends on the platform), the “cool” and ease-of-use UI design, and platform-user relation activities show that it “cares about” its users. The findings indicate that a well-designed social music system involves both social and technical factors to develop the ecosystem on the platform, fostering user engagement and improving social presence and technology acceptance.

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A MAIN VARIABLES OF SURVEY MEASURES

Main Motives (1=strongly disagree, 5= strongly agree)

People around are using it and recommended it

The UI design looks pretty and easy to use

It has accurately personalized recommendation of playlist

It has wonderful comments

It provides the annual report of your preference and listening activities

Perceived Usefulness(1=strongly disagree, 5= strongly agree)

NetEase Cloud Music makes me find songs more quickly

NetEase Cloud Music makes the search of songs easier

NetEase Cloud Music is very useful

NetEase Cloud Music enhances the effectiveness of searching songs

Perceived Ease of Use(1=strongly disagree, 5= strongly agree)

The use of NetEase Cloud Music is easy to learn

I find It is easy to become skillful to use NetEase Cloud Music

NetEase Cloud Music is very controllable

Social Presence(1=strongly disagree, 5= strongly agree)

When listening to music on NetEase Cloud Music, I have a sense of sociability

When reading comments, I feel like I am physically communicating with others

When listening to music on NetEase Cloud Music, I feel like I am listening to the same songs with friends