Analysis Report: Performance Evaluation on Two Music Streaming Platforms

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ABSTRACT − This paper presents a report on the performance evaluation of music streaming applications. A test on performance was conducted using participants that frequent music streaming in their everyday lives. The study was conducted with 12 participants that were divided into two group based on application preference. Two applications; Spotify and Apple Music were used. The outcome of the evaluation suggests that these applications need improvement. Some issues were brought to light where if corrected, could possibly enhance the satisfaction of users. Each platform has parts where user dissatisfaction rises, and parts where user satisfaction increases. Therefore, the management team should consider these problems and continue improving their user experience to constantly provide competition towards the other platform.

Keywords − Performance Evaluation, Platform Performance, Music Streaming Performance, Music Streaming Platform Evaluation, Spotify and Apple Music Performance.

1. INTRODUCTION

The Music Streaming space has become even more prevalent than ever before. A large part of this growth is due to the growth of wireless technologies such as wearable wireless earbuds. A lot of our participants generally have a good experience when using music streaming services. [1] With that being said, a company's interface of their product is said to be the most crucial representation of said company and customer communication is done with the services provided through the interface of a give application. Thus, a bad interface will make consumers try to find an alternative provider because they aren't able to utilize the system with ease. Furthermore, Aydogan, Delice and Papajorgji [4] referred that, people increasingly expect more from the functionality of a website, therefore the usability of sites as an important topic, for the time being, has emerged.

The aim of this report is to measure the performance of the two major music streaming services. With the result obtained from the report, we can obtain the dissatisfaction of users using these platforms, and thus observe what needs to be improved in the platform. The motivation behind this report is to overall improve the user experience in the platform as a user and consumer. This is because, as the landscape of the entertainment industry changes, we move more towards the ease of access to worldwide music on demand, rather than the traditional radio way back when the radios was the only method to enjoy music. With the result obtained, we are able to provide a little bit of insight into what consumers prefer with their entertainment interface and performance. The key findings that were found during the research was the SUS score variation in the participants and also what the SUS scores say about the participants and their application opinions. Further details are explained in the Results and Discussion section.

2. METHODOLOGY

This section explains the methodology used to obtain and achieve the objectives of the study. Six (6) participants were utilized for the study and were divided into two group based on the Music Streaming platforms. Two Music Streaming Service platforms: Spotify and Apple Music were used. The usability of these platforms are a fundamental principle of the effectiveness, efficiency and degree of comfort of the interaction between users with the interfaces. Thus, this performance and usability study seeks to measure the usability of these two applications through the System Usability Scale (SUS).

To put simply, the research is done in order to learn or find out whether something works accordingly or not. Questionnaire was used for data collection during the performance test and the questionnaire used were adopted from the System Usability Scale (SUS) questionnaires. The first part of the experiment is browsing the applications based on several tasks that were conducted by the participants. We asked each participant to carry out certain tasks related to the music streaming process. This includes: 1) Finding a particular song (踊り子「Odoriko」- Vaundy); 2) Finding a certain album (狂言「Kyougen」- Ado); 3) Finding a specific artist (ヨルシカ「Yorushika」); 4) Creating a playlist consisting of 3 specific songs. During these tasks, we observed the student's performance and recorded the time taken to complete each task.

After finishing the first part, the System Usability Scale (SUS) questionnaire is brought out for the second part. The questionnaire measures the usability satisfaction level of each application. This process used a five-point Likert Scale ranging from "strongly disagree = 1" until 'strongly agree = 5". And these data were analysed and calculated using the SUS formula of computing usability. The formula used are as follows:

$$SUS = 2.5 \left(20 + \sum(SUS01, SUS03, SUS05, SUS07, SUS09) - \sum(SUS02, SUS04, SUS06, SUS08, SUS10) \right)$$

Source: "System usability scale," *Wikipedia*, Jan. 21, 2019

3. RESULTS AND DISCUSSION

3.1 User's Performance

Spotify: Based on the recorded performance collected and analysed, Table 1 below shows the tasks that have been done by the participants and the time taken for each task on the Spotify application.

Time on Task:

Participants	Task 1 Song Search	Task 2 Album Search	Task 3 Artist Search	Task 4 Playlist Creation
1	6.7s	7.9s	5.6s	28.2s
2	7.1s	8.0s	5.7s	32.1s
3	6.3s	7.9s	5.2s	26.4s
Avg.	6.7s	7.9s	5.5s	28.9s

Table 1. Time taken on task (Spotify)

Task 1 shows an average time of 6.7s to complete a song search. Task 2 shows the most consistent time taken of an average of 7.9s to search for a particular album. Task 3 shows the least amount of time taken between each task of an average of 5.5s to search for a particular artist. Task 4 required participants to create a playlist consisting of 3 specific songs, and also took the longest time to complete with a mean of 28.9s.

Apple Music: Based on the recorded performance collected and analysed, Table 2 below shows the tasks that have been done by the participants and the time taken for each task on the Apple Music application.

Time on Task:

Participants	Task 1 Song Search	Task 2 Album Search	Task 3 Artist Search	Task 4 Playlist Creation
1	6.3s	5.3s	5.7s	30.3s
2	6.6s	5.1s	5.5s	35.8s
3	7.0s	5.4s	5.8s	33.9s
Avg.	6.6s	5.3s	5.7s	33.3s

Table 2. Time taken on task (Apple Music)

Task 1 shows an average time of 6.6s to complete. While task 2 shows the lowest average time of 5.3s to complete and task 3 shows an average time of 5.7 to complete an artist search. Task 4 in the Apple Music also required participants to create a playlist consisting of 3 specific songs, which also has the longest average time of 33.3s.

3.2 Application Usability Evaluation

After the participants completed the first part of the research, the System Usability Scale (SUS) questionnaire was used for the second part to the participants. This process used a five-point Likert Scale ranging from "strongly disagree = 1" until 'strongly agree = 5". And these data were analysed and calculated using the SUS formula of computing usability. The previously stated equation was used in order to obtain the SUS Score.

Spotify: Based on the questionnaire that was distributed towards the participants, Table 3 below shows the answers that the participants chose for each of the SUS questions based on the Spotify application. The number indicates the five-point Likert Scale.

Question No.	Participants		
	1	2	3
1	5	5	5
2	1	1	1
3	5	5	4
4	1	1	1
5	4	5	5
6	1	1	1
7	5	5	4
8	1	1	1
9	4	5	4
10	2	1	1
SUS Score	**92.5**	**100**	**92.5**

Table 3. Spotify SUS Evaluation Table

Table 3 shows the Spotify participants answers on the SUS survey for the Spotify application. Participant number 1 and 3 shows a SUS score of 92.5. According to N. Thomas [8], any SUS score above 80.3 is an A and means that generally, people love the application and will recommend it to others. The SUS score for participant number 2 shows a perfect score of 100, thus meaning that the participant loves the Spotify application as a music streaming service and chooses it as their main platform.

Apple Music: Based on the questionnaire that was distributed towards the participants, Table 4 below shows the answers that the participants chose for each of the SUS questions based on the Spotify application. The number indicates the five-point Likert Scale.

Question No.	Participants		
	1	2	3
1	5	5	5
2	2	1	1
3	4	4	4
4	1	1	1
5	4	5	4
6	1	1	1
7	4	5	5
8	1	1	1
9	5	4	4
10	1	1	1
SUS Score	**90**	**95**	**92.5**

Table 4. Apple Music SUS Evaluation Table

Table 4 shows the Apple Music participants answers on the SUS survey for the Apple Music application. Participant number 1 shows a SUS score of 90. Participant number 2 shows a SUS score of 95. While participant number 3 shows a SUS score of 92.5. All of the participants showed a SUS score above 80.3, which equates to an A and means that people generally love the application and would recommend it to others [8]. Based on the participants' SUS scores, this shows that they all would choose Apple Music as their main music streaming platform.

4.0 CONCLUSION

Music streaming services have gotten more and more popular as technology advances due to the wireless connectivity that is available. Thus, evaluating these services are crucial in ensuring the growth of our music entertainment is relatively on par with our

technological advancements. Based on our findings, the time taken for each participant in each application various slightly different. Among the Spotify participants, it is shown that the playlist creation consisting of 3 songs took the longest to complete with the average time of 28.9s. However, when comparing it with the Apple Music participants where the time taken to complete the exact same task in the Apple Music application was 33.3s, the 28.9s in Spotify shows a considerable amount of time saved. This highlights that the interface, layout and ease of understanding of the Spotify application in terms of creating playlists was more user friendly, and performed better. On the other hand, comparing the time taken for an album search in Apple Music, which is 5.3s, with the time taken in Spotify, which is 7.9s, for the exact same task shows a considerable amount of time difference. This highlights that Apple Music is much easier in terms of searching for songs in albums that are already set by the platform or by the artists.

In the second part of the study, the SUS score for the Spotify participants shows a consistent 92.5 for two participants and even a perfect score of 100 for one participant. Comparing these SUS scores with the Apple Music participants, which shows a 90, 95 and 92.5 across each participant respectively. This shows that the Apple Music participants are more critical in their evaluation and judges very harshly regarding their preferences in the music streaming services. However, this also highlights that the participants are consistent and shows an average between 90 – 95. The Spotify participants, shows one perfect score. This highlights that the Spotify participants are more likely to have a dedicated fan which will continue to use Spotify as their main music streaming service application.

In conclusion, this study has shown the various performances of both the application; Spotify and Apple Music. This can help other striving competitors in the music streaming space to improve their application and products in order to compete effectively. The more competition there is in a certain space, the better the quality of each product us consumers will get for a certain field.

References

[1] A. Hussain, and E.O.C. Mkpojiogu, "The effect of responsive web design on the user experience with laptop and smartphone devices". Jurnal Teknologi. 77, 2015, pp. 41-47.

[2] Brooke, John (1996). "SUS: a "quick and dirty" usability scale". In P. W. Jordan; B. Thomas; B. A. Weerdmeester; A. L. McClelland (eds.). Usability Evaluation in Industry. London: Taylor and Francis.

[3] C. Sanders, "I Tested Apple Music vs. Spotify, and I Have Thoughts on Which Is *Actually* Better," Cosmopolitan, Sep. 04, 2024. https://www.cosmopolitan.com/about/a61947850/apple-music-vs-spotify/

[4] E. K. Aydogan, E. K. Delice, and P. Papajorgji, "An Effective Approach for Evaluating Usability of Web Sites," Enterprise Business Modeling, Optimization Techniques, and Flexible Information Systems, (2013)97.Weekly

[5] J. R. Lewis, "The System Usability Scale: Past, Present, and Future," *International Journal of Human–Computer Interaction*, vol. 34, no. 7, pp. 577–590, 2018, doi: https://doi.org/10.1080/10447318.2018.1455307.

[6] L. Savvides and V. Orellana, "Spotify vs. Apple Music: The best music streaming service is...," CNET, Apr. 16, 2024. https://www.cnet.com/tech/services-and-software/apple-music-vs-spotify-whats-the-best-music-streaming-service-for-you

[7] L. Dunkley, "Apple Music vs. Spotify: Which is the best music app?," Tom's Guide, Aug. 09, 2021. https://www.tomsguide.com/face-off/apple-music-vs-spotify-which-is-the-best-music-app

[8] N. Thomas, "How to use the system usability scale (SUS) to evaluate the usability of your website," *Usability Geek*, Jan. 15, 2019. https://usabilitygeek.com/how-to-use-the-system-usability-scale-sus-to-evaluate-the-usability-of-your-website/

[9] T. Baker, "Spotify vs. Apple Music: Which is better?," Medium, Aug. 04, 2023. https://medium.com/@iamtimbaker/spotify-vs-apple-music-which-is-better-7b1aecb23039

[10] Wikipedia Contributors, "System usability scale," *Wikipedia*, Jan. 21, 2019. https://en.wikipedia.org/wiki/System_usability_scale