

## Usability Testing of the Metadata Management of Audio Archive

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### Abstract

*The aim of this research is to test the usability of the audio archive metadata management application. This application is used to record all song collection data in the form of cassettes and vinyl and is also used to search for collection data easily and quickly. This research used System Usage Scale (SUS) method to test the application usability. The SUS Testing was carried out by distributing a questionnaire which consists of 10 statements to 30 respondents to determine the assessment scale based on percentile rank, grade, adjective rating, acceptability, and net promoter score. The result of the system usage scale testing showed an average total score of 83. By detail, this result explained that the percentile range assessment scale is between 90-95%, grade is A, adjective rating is in the Excellent category, acceptability is in the acceptable category, and net promoter is in the promoter category. Thus, it can be concluded that the audio archive metadata management application is suitable for use as a search and retrieval tool for song collections in the form of cassettes and vinyl. However, in order to increase the application's usefulness, the application can be more developed in the future by adding additional features to meet the criteria as a better metadata management tool.*

**Keywords:** *Usability Testing, Metadata Management, Audio Archive*

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## INTRODUCTION

Metadata is structured information that describes, explains, finds, or at least makes information easy to find, use, or manage (Riley, 2017). Metadata is often referred to as data about data or information about information (Dashrath, 2014). For example, in book catalogues, metadata generally contains information such as book number, theme, title and author which can be used to search for specific books in the library (Wicesa, et al., 2017); for digital songs, it contains minimum information on the singer's name, genre, label, song title, album name, track number, release year (LANDR, 2022); and for analog songs stored on cassette or vinyl media, it contains at least the song title, singer's name, album name, genre, year of release and label.

Several previous studies have found out that good metadata management can speed up and/or make it easier to rediscover or group the required cultural heritage data collections. Metadata can help facilitate the rediscovery of cultural heritage in the form of audio archives in the form of pop songs (Anastasya, et al., 2023), more accurately classify cultural heritage in the form of music genres (Radhakrishna, et al., 2022), provide effective digital access to library resources to rediscover stored cultural heritage (Satija, et al., 2020), rediscover cultural heritage data in libraries (Akporthonor, 2020), generate metadata cultural heritage more quickly and easily (Wicesa, et al., 2017), and makes it easier to retrieve information about cultural heritage collections in the form of digital audio (Melvin, 2014). Thus, managing metadata as an archiving activity can be done by recording, collecting, processing and organizing existing information so that it can be found again easily and quickly. Retrieval is important because it ensures that information is well organized (Nikmah et al., 2022).

Metadata is information that can structurally explain, find, or make information easy to find, use, or manage (Riley, 2017). Metadata is often referred to as data about data or information about

information. This metadata contains information about the contents of data that is used for file/data management purposes later in a database.

According to Subli et al. (2017), metadata is information embedded in a file whose contents are an explanation of the file. This metadata contains information about the contents of data that is used for file or data management purposes later in a database. Sopiandi (2017) in his research explains that metadata is structured information that describes, explains, finds or at least makes information easy to find, use or manage. Metadata is often referred to as data about data or information about information. This metadata contains information about the contents of data that is used for file/data management purposes later in a database. Metadata is very necessary in the digital identification process related to a file, by digging up the metadata information in a file it will certainly make it easier to draw red threads in a digital forensics case. You can also see a series of events, when they were changed, whether they are original or whether the file has undergone a digital change process. Following are the types in metadata:

1. **Descriptive Metadata:** describes resources for purposes such as discovery and identification. This can include elements such as title, abstract, author, and keywords.
2. **Structural Metadata:** shows how compound objects are put together, for example, how pages are ordered to form sections/chapters.
3. **Administrative Metadata:** provides information to help manage resources, such as when and how the resource was created, file types and other technical information, and who can access it.
4. **Maintenance Metadata:** offers information that can strengthen the entire maintenance procedure of a particular digital object/file. This information can include important details that the system needs to communicate or interact with a particular file.
5. **Provenance metadata:** By provenance metadata, this means it is most relevant when something changes or is often duplicated. Now, for physical objects this is less important, because we don't duplicate them very often. However, in the digital world, this happens all the time.

SUS is a tool for measuring the effectiveness of an application in the form of a practical questionnaire that is used to obtain results for information system usability testing based on each user's personal point of view (Wahyuningrum, 2021). The SUS questionnaire makes it possible to carry out subjective usability testing at a high level, which after years of work carried out by other researchers shows that this questionnaire is a valid and reliable tool. In addition, this questionnaire allows it to be carried out on a relatively small sample of subjects. Based on developments carried out by previous researchers, the SUS value can be interpreted in 5 ways, namely percentile rank, grading score, adjective, acceptability, and net promoter score.

#### 1. Percentile Rank

SUS scores are fed into a percentile rank curve obtained from a large database containing a set of normalized SUS scores. The results of this conversion illustrate how good the SUS value of the system we are studying is when compared to other systems in the database that has been compiled.

#### 2. Grades

Interpretation in this way is closely related to the use of percentile rank because the grouping of letter grades is based on normalization of the distribution of values from the percentile curve.

#### 3. Adjective Ratings

The adjective range is used to observe the relationship between the SUS score and the user's rating answers from the system and product they are evaluating by connecting it to a scale of characteristics containing, among others, Best Imaginable, Excellent, Good, OK, Poor, and Worst Imaginable to describe the user's impression of the system.

#### 4. Acceptability

Bangor et al. in Sauro (2018) sets the requirements for entering the acceptable criteria with a score of more than 70, not acceptable less than 50, and a score of 50-70 including marginally acceptable.

#### 5. Net Promoter Score

Promoters is a term for respondents who have a high probability of promoting a system or product to other people, whereas detractors are people who are likely to prevent other people from using the system or product. Sauro (2018) consistently sees that there is a strong correlation between SUS and Net Promoter Score. According to him, to achieve the promoter classification, at least the SUS score must reach 81 or more, while for detractors it is associated with an SUS score of 53 or less, and the passive category is a score in between (with an average score of 70).

According to Soegaard (2023), SUS testing can be applied on many applications resulted from the development of technology, healthcare, e-commerce, finance, education, and automotive, including a web-based application (HN, et al., 2015). Previous researches that used SUS testing for the web-based application could be found out on the researches of Welda et al. (2020), Kaban et al. (2020), Kesuma (2021), Kurniawan et al. (2022), Susila & Arsa (2023), and Gusmaliza & Aminah (2024).

The Indonesian Music Museum (MMI) as an institution for storage, care, security, and utilization of intangible cultural heritage related to music has a collection of 45 thousand consisting of cassettes, compact disks, vinyl records, magazines, clothing and a number of fine musical instruments from famous musicians in Indonesia to abroad (Ibrahim, 2023). The use of technologies and initiatives that involve diverse, rapidly changing and extensive data sets, which challenge the effectiveness of conventional technologies, skills and infrastructure in handling them (Sukma et al., 2023). Management of metadata for song collections, especially in the form of cassettes and vinyl, is carried out by MMI using the Web-Based Audio Archive Metadata Management Application. This application can be used as a tool to ease and speed up the retrieval of song collections on MMI.

## RESEARCH METHODS

This research uses SUS and descriptive data analysis methods. According to Brooke (1996), SUS is a global assessment of usability aspects that are subjectively felt by users. It is also a reliable and low-cost usability scale. As a choice of usability testing, SUS has some other advantages. They are simple, versatile, and benchmarked. SUS has 10 Likert-scale statement items as follows:

1. I like to use this system frequently.
2. I find this system to be more complicated than it should be.
3. I think the system is simple and easy to use.
4. I need technical support to use this system.
5. I find the system functions smoothly and is well-integrated.
6. I think there are a lot of irregularities in the system.
7. I think most people can learn this system quickly.
8. I find this system to be time-consuming.
9. I feel confident while using this system.
10. I think there are a lot of things to learn before I can start using this system.”

Source: Sharfina & Santoso (2016)

The SUS questionnaire uses a 5 points Likert scale. Respondents were asked to provide ratings of "Strongly disagree", "Disagree", "Neutral", "Agree", and "Strongly agree" on the 10 items of the SUS statement according to their subjective assessment. If the respondent feels they have not found the right response scale, the respondent must fill in the midpoint of the scale. Each statement item has a contribution score. Each item's contribution score will range from 0 to 4. For items 1,3,5,7, and 9 the contribution score is the scale position minus 1. For items 2,4,6,8, and 10, the contribution score is 5 minus the position scale. Multiply the total contribution scores by 2.5 to get the overall system usability score. SUS scores range from 0 to 100. The following is the formula for calculating the SUS score:

$$\text{SUS score} = ((S1-1)+(5-S2)+(S3-1)+(5-S4)+(S5-1)+(5-S6)+(S7-1)+(5-S8)+(S9-1)+(5-S10))*2.5$$

$$\text{Final SUS score} = \Sigma (\text{SUS Score})/N$$

The overall SUS score is obtained from the average of individual SUS scores. The SUS questionnaire was distributed to 30 respondents (MMI's employees and visitors). According to Roscoe (1975) the appropriate number of samples for research is between 30 and 500.

## RESULT AND DISCUSSION

Responses were obtained from 30 respondents. Based on status, respondents consisted of 5 MMI employees and 15 MMI visitors. Based on gender, respondents consisted of 19 males and 11 females. The questionnaire results are then calculated using the SUS formula to get the Total Average of SUS Score. The results of the SUS score assessment is shown in the following Table 1.

**Table 1. SUS Score Calculation Results**

No	Respondent	SUS Statement										Total	SUS Score
		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10		
1	R1	4	1	4	2	4	2	5	1	4	1	34	85
2	R2	5	2	5	2	5	2	5	2	4	2	34	85
3	R3	3	1	4	1	5	2	4	1	4	2	33	83
4	R4	5	3	5	3	5	2	5	3	5	3	31	78
5	R5	4	2	5	1	5	2	4	1	4	1	35	88
6	R6	4	1	4	2	5	1	5	2	4	1	35	88
7	R7	5	2	4	1	5	1	5	1	4	1	37	93
8	R8	4	1	4	1	5	1	5	2	4	2	35	88
9	R9	5	1	5	1	5	2	5	1	5	2	38	95
10	R10	4	2	4	2	4	2	4	2	4	2	30	75
11	R11	4	1	4	2	5	1	5	1	4	1	36	90
12	R12	5	3	5	3	5	2	5	3	3	3	29	73
13	R13	4	2	5	2	4	2	5	2	4	2	32	80
14	R14	4	3	5	3	5	1	5	3	5	3	31	78
15	R15	4	2	4	2	4	2	4	2	4	2	30	75
16	R16	4	2	4	2	5	1	5	2	5	2	34	85
17	R17	4	2	4	2	4	2	4	2	3	2	29	73
18	R18	5	2	5	2	5	1	5	2	4	2	35	88
19	R19	4	2	4	2	5	3	5	2	4	2	31	78

No	Respondent	SUS Statement										Total	SUS Score
		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10		
20	R20	5	2	5	1	5	2	5	1	3	3	34	85
21	R21	4	1	4	1	4	1	4	2	4	2	33	83
22	R22	4	1	5	2	5	2	4	2	5	2	34	85
23	R23	5	1	5	1	4	1	5	1	4	1	38	95
24	R24	4	2	4	2	5	3	5	2	4	2	31	78
25	R25	4	2	4	2	4	2	4	2	3	2	29	73
26	R26	5	1	5	1	4	1	4	1	3	1	36	90
27	R27	4	2	4	2	5	3	5	2	4	2	31	78
28	R28	4	2	5	2	5	2	5	2	5	2	34	85
29	R29	3	1	3	1	5	1	3	1	4	2	32	80
30	R30	5	2	5	2	4	2	4	2	4	2	32	80
Average SUS Score (Final Result)												83	

**Source: Data processed (2024)**

The results show an average SUS score of 83.

**Validity Test**

The validity test of the statement items was based on the answers of 30 respondents. The results of the validity test are shown in Table 2 below.

**Table 2. Validity Test Results**

Statement	Rcount	Ttable	Information
Statement 1	0.414156	0.361	Valid
Statement 2	0.796547	0.361	Valid
Statement 3	0.559016	0.361	Valid
Statement 4	0.750648	0.361	Valid
Statement 5	0.381057	0.361	Valid
Statement 6	0.383993	0.361	Valid
Statement 7	0.573067	0.361	Valid
Statement 8	0.750648	0.361	Valid
Statement 9	0.364777	0.361	Valid
Statement 10	0.680103	0.361	Valid

**Source: Data processed (2024)**

Validity test uses Correlation (2 tail) with a significance level of 5%. Results are considered valid if  $R_{count} > R_{table}$ . Table 3 shows that the Rcount for the 10 questionnaire items is greater than the Rtable, so the 10 questionnaire items are valid.

**Reliability Test**

Reliability test using Cronbach's Alpha, will be considered reliable if the value is greater than 0.7. Reliability test results are as shown in Table 3 below:

**Table 3. Reliability Test Results**

Cronbach's Alpha	Number of Items	Information
0.768405095	10	Reliable

**Source: Data processed (2024)**

The results of the reliability test show that the Cronbach's Alpha value for the 10 questionnaire items is 0.768, greater than 0.7 so the questionnaire is considered reliable.

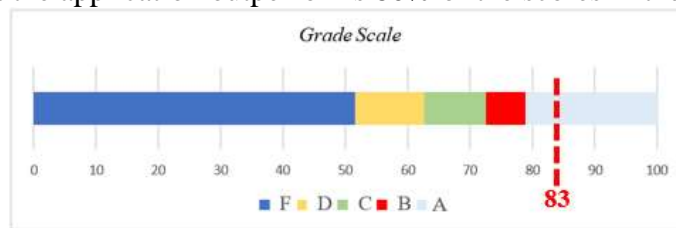
From the result of validity and reliability tests, it could be concluded that the SUS questionnaire instrument used in this research are consistent and accurate to test the usability of audio archive metadata management application that is implemented by MMI. When the questionnaire instrument is valid and reliable, further research process can be carried out and analyzed.

The following is the interpreting result of SUS usability test based on Percentile Scale, Grades Scale, Adjective Rating Scale, Acceptability Scale, dan Net Promotor Scale.



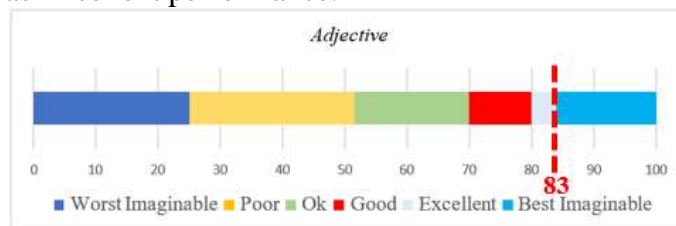
Picture 1 The Percentile Rank of SUS Score

Based on Picture 1, the SUS Score of 83 is above average (68) and in the Percentile Rank between 80-90. It implies that the application outperforms 80% of the scores in the database.



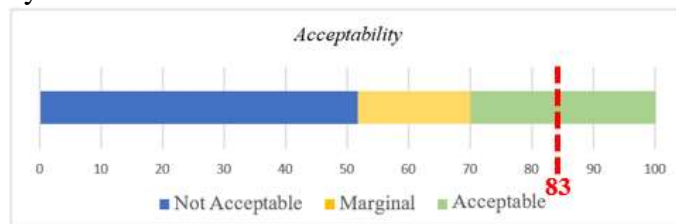
Picture 2 The Grade Scale of SUS Score

Based on Picture 2, the SUS Score of 83 is between 80.8-84.0 or categorized as A. It indicates that the application has Excellent performance.



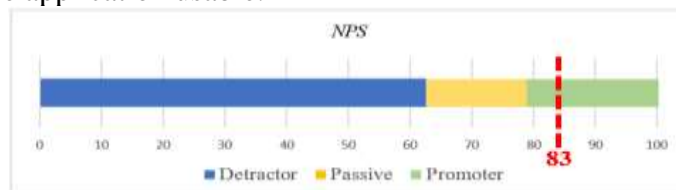
Picture 3 The Adjective Rating Scale of SUS Score

Based on Picture 3, the SUS Score of 83 is in the Excellent position. It means that the application has significant usability.



Picture 4 The Acceptability Scale of SUS Score

Based on Picture 4, the SUS Score of 83 is in the area of Acceptable. It means that the users (respondents) find the application usable.



Picture 5 The Net Promoter Scale of SUS Score

Based on Picture 5, the SUS Score of 83 is in the area of Promoter. It means that the users (respondents) are highly likely to recommend the application to use as a metadata retrieval tool.

## CONCLUSION

The audio archive metadata management application managed by MMI is an application that has some features to retrieve the metadata of song collections in the form of cassette and vinyl. The search criteria (album filters) are based on the name of singer, album in alphabetical order, genre, album media, and released year. Whereas the detail metadata displayed by the application covers the information about the album title, released year, album description, genre, production media, producer, number of Intellectual Property Right (if available), and the collection list of Side A and B songs in the album. This application uses two roles of user i.e., administrator and guest. An administrator has fully accessed to the application and can manage all the metadata of the song collection, but a guest can only trace the collection based on the provided search criteria or album filters. During the implementation, the application needs usability testing to get to know whether the application has met the desired needs of the user. SUS is a global assessment of usability aspects that are subjectively felt by users. The SUS score can indicate the level of user acceptance of the Audio Archive Metadata Management application in MMI. The SUS score obtained from this research are as follows: the percentile range is between 80-90%, the grade is A, the adjective rating is in the Excellent category, the acceptability is in the acceptable category, and the net promoter is in the Promoter category. Thus, the overall SUS score indicates that this application is acceptable.

Even though, the usability measurement results show that the metadata management application is usable. The application should be further developed so that its usefulness can be maximized. Adding additional features to meet the criteria as a better metadata management tool can be taken into consideration.

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