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Article

Implementation of Validity and Reliability Tests on Service Satisfaction Levels of the Spotify Application Using SPSS Software

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Abstract

Spotify is a legal digital music application widely used for online streaming, especially popular among students. This popularity provides a solid foundation for conducting a case study on user satisfaction levels with Spotify in Indonesia. The research employs a questionnaire to collect data, which is subsequently tested for validity and reliability using SPSS software. The results indicate that several variables, such as improved user experience, user-friendly interface, useful features, and fast performance, have high validity values, with significance levels below 0.05. These variables exceed the r-table, with values ranging from 0.5 to 0.904. In cases where any variable is found invalid, retesting will be conducted to ensure the data is valid. Reliability testing produced a Cronbach's alpha coefficient of 0.772, demonstrating that the data used in this study is reliable, as it exceeds the acceptable threshold of 0.6. Therefore, this research provides valuable insights into user satisfaction levels regarding Spotify's services in Indonesia, making it a trustworthy resource for understanding user experiences and areas for improvement within the application. Overall, the findings contribute to a deeper understanding of user preferences and satisfaction in the digital music streaming landscape.

Keywords: Reliability, Spotify, SPSS, Validity

1. Introduction

Technological Advancements in Application Development and User Satisfaction Analysis of Spotify. The advancement of technology today is progressing rapidly, especially in application technology, which is becoming increasingly sophisticated. The development of information systems and computer technology has seen significant growth, aligning with the public's demand for timely and accurate information. The fast-paced nature of society in adapting to technological trends requires the availability of quick, precise, and reliable information [1]. This encourages individuals to keep up with technological advancements, avoiding being labeled as outdated.

The ease of internet access has led to changes in people's lifestyles. Music, as a medium of artistic expression, reflects the culture of a society and has become an integral part of daily life. People can now download music from the internet or access it via websites. A website is a collection of interrelated web pages that display various forms

of information, such as text, images, and audio, within a domain [2]. Music enthusiasts can conveniently use digital music applications, which can be downloaded on various smartphone devices [3].

The popularity of Spotify as a digital music application among university students provides a solid foundation for conducting a case study on user satisfaction levels in Indonesia. To gather relevant data, a survey was conducted using a questionnaire distributed to 50 respondents. The results of this survey will help evaluate the extent to which users in Indonesia are satisfied with Spotify's services and provide insights into potential improvements to enhance the user experience in the future. In addressing this issue, various analytical methods are necessary. This research draws from several journal references that address similar issues and apply SPSS software for analysis. For instance, the journal titled The Impact of Facilities and Visitor Experience on Visitor Loyalty Mediated by Visitor Satisfaction concluded that improvements are needed to increase visitor volume [4]. Similarly, another study on The Impact of Reward Systems and Work Culture on Job Satisfaction and Its Implications for Employee Performance in Indonesian workers in Busan, South Korea, using SPSS, showed that the labor satisfaction levels were relatively high [5]. Other related journals, such as one analyzing The KAI Access Interface as a Factor of User Satisfaction [6], and one on Customer Satisfaction with Shopee's E-Commerce Display [7], also used SPSS to identify the impact of interface design on user satisfaction. Additionally, studies on the ease of using e-wallets as a factor in customer satisfaction [8] and brand identification with products like Erigo [9] and Bearbrand [10] also employed SPSS for data processing. This demonstrates that SPSS is an appropriate software tool for research based on identifying customer satisfaction.

Spotify is one of the biggest music streaming channels in the world. The company is primarily responsible for the provision of legitimate music streaming services. The services are available to users on a variety of mobile devices for free or a fee, and they rely on specific advertising to make money. Gimlet Media and Anchor were purchased by Spotify in 2018. Gimlet Media concentrates on the narrative podcast industry and produces high-quality audio material [11]. The popularity of Spotify among students serves as a solid foundation for conducting a case study on user satisfaction analysis in Indonesia. Data collection was carried out through a survey involving 50 respondents. The results of this survey aim to evaluate the satisfaction level of Spotify users in Indonesia and provide insights for potential improvements to enhance the user experience in the future. Addressing this issue requires various analytical methods, including statistical analysis using SPSS software.

References to studies with similar objectives include a journal analyzing the impact of facilities and visitor experiences on visitor loyalty mediated by visitor satisfaction. This study concluded that specific improvements are necessary to boost visitor numbers [4]. Another study on the effects of reward systems and work culture on job satisfaction, with implications for performance among Indonesian workers in Busan, South Korea, also utilized SPSS software. The findings demonstrated that data collection and analysis with SPSS yielded reliable conclusions regarding Indonesian workers' performance levels [5].

The problem was addressed using statistical analysis with validity and reliability testing methods. Validity testing measures how well a tool evaluates what it is intended to evaluate. A questionnaire's validity determines whether it is appropriate or valid for the research. Meanwhile, reliability refers to the extent to which a measuring instrument can consistently produce stable results over repeated applications under the same conditions. For instance, a test is considered reliable if it yields consistent outcomes despite different testing conditions.

In this research, the survey data titled "Survey on User Satisfaction Levels of the Spotify Application" formed the basis for analysis. After collecting the data, the next step involved processing it with statistical software known as SPSS. SPSS enables advanced statistical analysis, both parametric and non-parametric. It simplifies calculations and allows for analyzing studies with multiple variables. Once the data is imported into SPSS, calculations such as Pearson correlations, Cronbach's alpha, significance values, and reliability coefficients are performed. Reliability reflects the extent to which data measurement provides consistent results, showcasing the consistency of repeated measures on the same data with the same tools [12].

This study highlights the critical role of validity and reliability testing in assessing Spotify users' satisfaction. By using SPSS software, researchers can accurately analyze and interpret survey data. The software provides detailed and clear statistical calculations, aiding in basic statistical education, particularly in descriptive statistics [2]. Different types of validity tests, such as construct validity, content validity, and criterion-related validity, further enhance the robustness of the analysis [13]. With validity and reliability testing, companies can measure user satisfaction levels more precisely. The more accurate and reliable the data, the more valid the results. Employing SPSS software also plays a significant role in ensuring efficient data processing and analysis. Thus, applying validity and reliability testing in industry settings delivers substantial benefits for improvement and strategic decision-making.

2. Material and Method

The method used is a survey, where data is collected through a questionnaire administered at a specific time, resulting in primary data based on the responses of the questionnaire participants. The data required for this study includes the following:

1. Respondent's name
2. Respondent's age
3. Respondent's gender
4. Data on improved experience
5. Data on user-friendly interface
6. Data on useful features
7. Data on fast performance
8. Data on encountered bugs
9. Data on design changes
10. Data on updates enhancing comfort
11. Data on beneficial open Spotify features
12. Data on efficient navigation
13. Data on useful playlists
14. Data on useful playlist editing
15. Data on improved sound quality
16. Data on new playlist appearance
17. Data on frequency of Spotify use
18. Data on satisfaction with updates

No	Name	Age	Gender	Improved Experience	User Friendly Interface	Useful Feature	Fast Performance	Encountered Bug	Design Change	Update Enhacing Comfort	Beneficial Open Spotify Feature	Efficient Navigation	Useful Playlist	*Useful Playlist Editing*	Improve Sound Quality	New Playlist Appearance	Frequency of Spotify Use	Satisfaction with Update
1	Santoso	18	L	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	Ihzha	21	L	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	Ryan	21	L	4	4	4	4	4	3	3	3	3	3	3	3	3	2	3
4	Habibur	19	L	2	2	3	4	4	4	5	1	4	5	3	3	4	2	3
5	Kemal	19	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	Widyatama	18	L	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
7	Ibnu	20	L	3	4	4	4	4	4	4	3	3	4	4	3	4	4	4
8	Taaj	19	P	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
9	Kalya	20	P	3	4	4	4	2	4	4	4	4	4	5	3	4	2	4
10	Lovia	19	P	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5
11	Nugraha	19	L	3	4	4	4	2	3	4	3	3	4	3	3	4	4	3
12	Febry	19	P	4	4	4	4	3	4	4	4	4	5	4	5	4	4	4
13	Nadia	19	P	3	3	3	3	2	3	3	3	3	4	4	3	3	3	3
14	Amelia	19	P	4	4	4	4	3	4	4	4	4	5	4	3	4	4	4
15	Elistia	19	P	3	4	3	4	3	5	5	3	3	4	4	3	4	2	3
16	Husin	18	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
17	Vania	20	P	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	Anas	18	P	3	4	4	3	3	3	3	4	4	4	4	3	3	3	3
19	Erlangga	19	L	4	4	4	5	2	4	4	3	2	4	5	2	3	4	4
20	Putri	19	P	4	4	5	5	2	4	5	4	4	4	4	3	4	4	4
21	Ivan	19	L	4	2	3	4	5	5	5	5	5	5	5	4	5	5	4
22	Delita	20	P	5	3	4	5	1	3	4	5	5	5	5	5	3	3	4
23	Risma	19	P	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
24	Azka	19	P	5	5	5	5	3	5	5	4	5	4	5	5	5	5	5
25	Natasha	19	P	4	3	4	4	5	5	3	4	3	4	4	4	4	4	3
26	Yani	19	P	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5
27	Rindhi	20	P	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28	Riski	20	L	2	2	3	4	2	3	2	2	2	3	2	2	2	3	2
29	Bahira	19	P	4	4	4	4	4	4	5	5	5	5	4	3	5	4	4
30	Wisnu	20	L	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
31	Vindya	20	P	4	4	4	3	3	4	4	4	4	4	4	3	4	4	4
32	Salwa	19	P	4	3	4	4	1	3	4	4	4	4	4	3	3	4	3
33	Qhintara	19	P	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
34	Ulfa	18	P	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5
35	Azizah	19	P	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
36	Ainur	18	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
37	Izza	19	P	3	3	3	4	3	3	4	3	3	3	3	3	3	4	3
38	Sadewa	19	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
39	Dinda	20	P	3	3	3	3	4	4	3	4	4	4	4	3	4	4	3
40	Maritza	19	P	4	4	5	5	2	4	4	4	4	4	4	4	4	4	4
41	Maura	19	P	5	4	5	5	2	5	5	5	5	5	5	3	3	3	4
42	Zico	19	L	4	3	3	4	2	4	4	4	4	4	4	4	4	4	4
43	Ommar	19	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
44	Nabila	21	P	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5
45	Trisnia	19	P	4	4	4	4	2	4	4	4	4	4	4	4	4	4	4
46	Putra	20	L	3	4	4	3	3	4	4	4	3	4	4	4	4	5	5
47	Budi	19	L	4	5	4	4	3	4	4	5	4	4	5	4	4	4	5
48	Maula	20	L	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
49	Silvi	18	P	4	4	3	4	3	4	3	4	5	4	4	3	4	5	5
50	Rayhan	19	L	4	5	5	5	5	5	5	4	5	5	4	4	4	5	4

Fig 1. Data

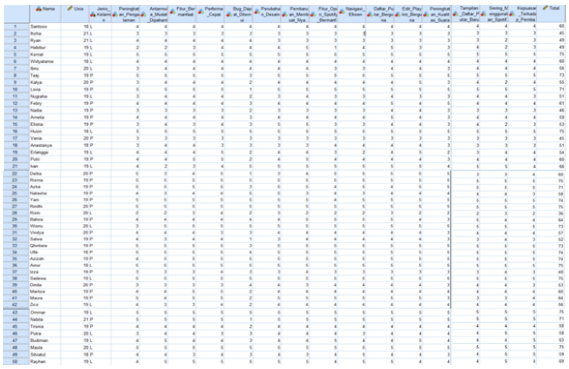

Fig 2. Input Data

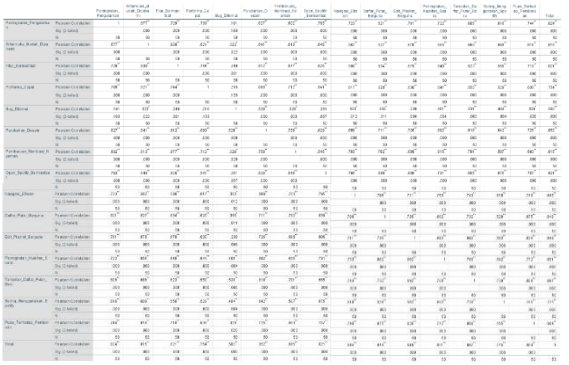

Fig 3. Output Data

This study used validity test to determine whether a questionnaire is valid. A questionnaire is considered valid if the questions are capable of revealing the aspects the questionnaire aims to measure. A test is said to have high validity if it performs its measurement function well or provides precise and accurate results in accordance with the purpose of the test. Conversely, a test producing irrelevant data to the intended purpose of measurement is said to have low validity.

The validity test can be performed using the SPSS program. A commonly used technique for validity testing is the Pearson Bivariate Correlation (Pearson Product-Moment Correlation). This technique correlates the score of each questionnaire item with the total score, where the total score is the sum of all items. Items that significantly correlate with the total score indicate that these items support revealing the measured construct (valid). An item is valid if the r-calculated value is greater than or equal to the r-table value (two-tailed test with a significance level of 0.05) [14]. Types of Validity in Research are Internal validity, External validity, Criterion validity, Content validity, Construct validity [15] [16].

These three types of validity are critical for ensuring that the measurement tools in a study accurately capture the data intended for the research objectives, enhancing both the credibility and applicability of the findings.

Otherwise reliability can be specifically defined as the consistency observed in a series of methods, conditions, and results. This concept emphasizes reliability as the consistency of research outcomes across different conditions (time and place). Generally, reliability reflects the extent to which an instrument is trustworthy and dependable in representing what is being observed and studied.

Reliability shares similarities with validity, particularly in their shared focus on enhancing the quality of instruments and research outcomes. Both techniques contribute significantly to improving the integrity of data and the overall research process. The reliability of an instrument is measured using its reliability coefficient, which ranges from 0 to 1 [17]. This coefficient is denoted as rxr_xrx, where xxx represents the specific case being evaluated. The reliability test is commonly conducted using Cronbach's Alpha formula. The value of Cronbach's Alpha determines the level of reliability as follows:

- Alpha < 0.50: Low reliability
- 0.50 < Alpha < 0.70: Moderate reliability
- Alpha > 0.70: Sufficient reliability
- Alpha > 0.80: Strong reliability
- Alpha > 0.90: Perfect reliability

A lower alpha value indicates a higher number of unreliable items. A research instrument is considered reliable if the Cronbach's Alpha value exceeds 0.60.

- Cronbach's Alpha > 0.60: The questionnaire items are considered reliable.
- Cronbach's Alpha < 0.60: The questionnaire items are considered not reliable [18].

This approach ensures that the research instrument consistently produces accurate and dependable data across different conditions, supporting the overall validity and reliability of the study. This study also used SPSS as a software application with advanced statistical analysis capabilities and a data management system within a graphical environment, utilizing descriptive menus and simple dialog boxes for ease of use. Most educational and non-educational institutes

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use SPSS due to its user-friendly features [19]. Various tasks can be executed effortlessly using pointing and clicking features with a mouse. SPSS is widely applied in marketing research, quality improvement, and scientific studies. SPSS has since expanded its capabilities to serve diverse user needs, such as manufacturing processes and scientific research. Reflecting this evolution, SPSS now stands for *Statistical Product and Service Solutions*. The software can handle various data formats or directly input data via the SPSS Data Editor [20].

3. Results and Discussion

3.1 Invalid Variables

In this study, all variables are valid because all data or calculated r values show values greater than the r table value, with a significance level of < 0.05.

3.2 Valid Variables

3.2.1 Improved Experience

The Pearson correlation value for the improved experience variable is 0.824, which is the calculated r value. This variable is considered valid for the validity test because the calculated r is greater than the r table, specifically 0.824 > 0.2787. The significance level is also less than 0.05, at 0.00 < 0.05.

3.2.2 User-Friendly Interface

The Pearson correlation value for the user-friendly interface variable is 0.815. This variable is valid for the validity test because 0.815 > 0.2787. The significance level is less than 0.05, at 0.00 < 0.05.

3.2.3 Useful Features

The Pearson correlation value for the useful features variable is 0.821. This variable is valid as 0.821 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.4 Fast Performance

The Pearson correlation value for fast performance is 0.754, which is valid as 0.754 > 0.2787, and the significance is 0.00 < 0.05.

3.2.5 Bugs Encountered

The Pearson correlation value for encountered bugs is 0.5, which is valid since 0.5 > 0.2787, and the significance level is 0.00 < 0.05.

3.2.6 Design Changes

The Pearson correlation for design changes is 0.852, making it valid as 0.852 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.7 Comfortable Updates

The Pearson correlation value for updates enhancing comfort is 0.815, valid since 0.815 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.8 Beneficial Open Spotify Features

The correlation for beneficial open Spotify features is 0.821, valid as 0.821 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.9 Efficient Navigation

The Pearson correlation for efficient navigation is 0.845, valid since 0.845 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.10 Useful Playlists

The Pearson correlation value for useful playlists is 0.818, valid as 0.818 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.11 Useful Playlist Editing

The correlation for useful playlist editing is 0.849, valid since 0.849 > 0.2787, and the significance level is 0.00 < 0.05.

3.2.12 Improved Sound Quality

The Pearson correlation value for improved sound quality is 0.851, making it valid as 0.851 > 0.2787, with a significance level of 0.00 < 0.05.

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3.2.13 New Playlist Appearance

The Pearson correlation for new playlist appearance is 0.887, valid since 0.887 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.14 Frequent Use of Spotify

The Pearson correlation for frequent use of Spotify is 0.775, valid as 0.775 > 0.2787, with a significance level of 0.00 < 0.05.

3.2.15 Satisfaction with Updates

The Pearson correlation value for satisfaction with updates is 0.904, making it valid since 0.904 > 0.2787, with a significance level of 0.00 < 0.05.2.

3.3 Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.772	16

Fig 4. Reliability Statistics

Parameters:

- Cronbach's alpha value > 0.6 = the item is reliable.
- Cronbach's alpha value < 0.6 = the item is not reliable.

Analysis:

The results of the analysis using the Cronbach's alpha technique yielded a reliability coefficient of 0.772. This indicates that the data used in this study is reliable and trustworthy, as the Cronbach's alpha value is greater than 0.6 (0.772 > 0.6).

Validity refers to the test used to indicate the extent to which a measurement tool accurately measures what it intends to measure. Reliability, on the other hand, refers to the consistency observed across a series of methods, conditions, and results obtained. Based on the output above, there are two stages. The first stage is the output correlations, which yields the Pearson correlation value— the calculated r value obtained from running the program in SPSS. Significance refers to the truth value of a hypothesis that is accepted or rejected. The second stage is reliability statistics, which results in the Cronbach's alpha value or reliability coefficient and the number of variables. Based on the validity testing analysis, no invalid variables were found, as the values for each variable are greater than the r table value. If the obtained data has a calculated r value less than the r table, the data will be considered invalid and will require reprocessing. The valid variables include experience improvement, an easily understood interface, useful features, fast performance, encountered bugs, design changes, updates that enhance comfort, useful open Spotify features, efficient navigation, useful playlists, useful playlist editing, improved sound quality, new playlist appearance, frequent Spotify use, and satisfaction with updates. All of these variables are considered valid because their values exceed the r table value of > 0.2787. Therefore, the data can be directly processed, and reliability testing can be performed.

The analysis results from the validity test show that the Pearson correlation value for the experience improvement variable is 0.824, with a significance level of 0.00. For the easily understood interface variable, the Pearson correlation is 0.815, also with a significance level of 0.00. The useful features variable has a Pearson correlation of 0.821 with a significance level of 0.00. The fast performance variable has a Pearson correlation of 0.754, with a significance level of 0.00. The encountered bugs variable has a Pearson correlation of 0.5, with a significance level of 0.00. The design changes variable has a Pearson correlation of 0.852, with a significance level of 0.00. The comfort-enhancing changes variable has a Pearson correlation of 0.815, with a significance level of 0.00. The useful open Spotify features variable has a Pearson correlation of 0.821, with a significance level of 0.00. The efficient navigation variable has a Pearson correlation of 0.845, with a significance level of 0.00. The useful playlists variable has a Pearson correlation of 0.818, with a significance level of 0.00. The useful playlist editing variable has a Pearson correlation of 0.849, with a significance level of 0.00. The improved sound quality variable has a Pearson correlation of 0.851, with a significance level of 0.00. The new playlist appearance variable has a Pearson correlation of 0.887, with a significance level of 0.00. The frequently using Spotify variable has a Pearson correlation of 0.775, with a significance

level of 0.00. Finally, the satisfaction with updates variable has a Pearson correlation of 0.904, with a significance level of 0.00.

Based on the analysis from the reliability testing using Cronbach's alpha, a reliability coefficient of 0.772 was obtained. This indicates that the data used in the study is reliable and trustworthy, as the Cronbach's alpha value is greater than 0.6 (0.772 > 0.6). A high reliability level suggests that the instruments or measurements used are consistent and dependable. Additionally, this high level of reliability indicates that the research results can be relied upon to draw strong and valid conclusions. Reliable research findings will strengthen the study's outcomes, provide confidence in data interpretation, and enhance the overall quality of the research.

4. Conclusions

This research was conducted through an online survey, with data collected via a questionnaire analyzed using SPSS software. Based on the data processing results, it is evident that the theories of validity and reliability can address the issues related to user satisfaction with the Spotify application. Validity theory is crucial in measuring how well the questionnaire accurately assesses the intended concept, ensuring that the questions reflect relevant aspects of user satisfaction with Spotify. Valid data analysis will yield more reliable and relevant results. Additionally, reliability is also an important factor in this research. Consistent measurement outcomes will enhance confidence in the study. Using reliable measurement tools, such as previously tested and validated questionnaires, will help ensure that the research findings can be trusted. After analysis, it can be concluded that the obtained data is both valid and reliable. Recommendations for future research include deepening the understanding of factors influencing Spotify user satisfaction by exploring specific aspects that contribute to satisfaction levels, such as certain features, offered content, or social interactions within the app. Furthermore, combining this research with qualitative methods, such as interviews, could provide deeper insights into the Spotify user experience.

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