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Usability Analysis of the PERKASA Application Using the System Usability Scale (SUS) Method

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Abstract

The advancement of digital library services requires applications to be not only feature-rich but also highly usable for effective user engagement. This study evaluates the usability of the PERKASA application using the System Usability Scale (SUS) method. Utilizing a quantitative approach, 62 PERKASA application users were selected as respondents via purposive sampling. Respondents interacted with the core features of the application prior to completing the 10-statement SUS questionnaire. The data were analyzed through SUS score calculations and interpreted using the Acceptability Range, Grade Scale, and Adjective Rating. The results revealed that the PERKASA application obtained a SUS score of 73.95, surpassing the standard benchmark average of 68. According to the SUS interpretation frameworks, the application is categorized as "Acceptable," achieves a "Grade B," and is rated as "Good," demonstrating a satisfactory level of usability and user acceptance. Consequently, the PERKASA application effectively satisfies user requirements regarding ease of use, efficiency, and interaction comfort within digital library services. These findings provide a solid foundation for developers and library administrators to further improve user-oriented digital service quality.

Keywords: System Usability Scale (SUS), usability, mobile application, digital library, PERKASA.

INTRODUCTION

Digital technology has fundamentally transformed library services from a conventional model toward more accessible, efficient, and user-centered services. This transformation enables patrons to acquire information without spatial and temporal constraints, thereby enhancing the effectiveness of information services (Atika & Sayekti, 2023). The utilization of information and communication technology (ICT) within the library ecosystem has also been proven to improve service quality and expand the reach of digital literacy to the community (Nurhayati & Wijayanti, 2023). In line with these developments, the widespread use of mobile devices (smartphones) as the primary medium for information access drives libraries to deliver mobile application-based services that are more flexible and adapted to the needs of modern users (Tjiptasari, 2022). The development of mobile applications is considered capable of increasing user convenience as they are specifically designed for the devices currently most widely used by the public (Ardina et al., 2024; Islamy, 2018).

As a form of implementing digital transformation, the Department of Library and Archives of Pamekasan Regency developed the PERKASA (Perpustakaan Kabupaten Pamekasan) application, which provides collection searching, popular book information, reading recommendations, and various library information within a single mobile-based platform. The development of this application serves as a solution to the various limitations of the web-based Online Public Access Catalog (OPAC), which still faces obstacles regarding flexibility of use through mobile devices, user experience, and barriers to rapid and efficient information retrieval. Furthermore, the optimization of digital library services is also influenced by other factors, such as users' limited understanding of information searching techniques, network instability, and technological infrastructure that is not yet fully adequate (Elsadantia, 2023; Jannah et al., 2022).

Although the PERKASA application has been implemented, the success of an application is determined not only by the comprehensiveness of its features but also by the level of ease with which users can utilize those features. Usability evaluation is a critical aspect of ensuring that applications can be used effectively, efficiently, and provide user satisfaction. Various studies indicate that the System Usability Scale (SUS) method is effective for measuring user perceptions regarding the ease of use of a system (P. Y. Pratiwi et al., 2023) This method is widely used because it is capable of providing a rapid, simple, and reliable overview of a system's usability level from the user's perspective. However, there remains a need to conduct usability evaluations across various digital services, including digital library applications, to ensure that developed systems truly align with user needs and expectations.

Based on these conditions, this study aims to evaluate the usability level of the PERKASA application using the System Usability Scale (SUS) method. The SUS method was chosen because it is a simple, reliable, and widely used evaluation instrument to measure user perceptions regarding the ease of use of a system (Hyzy et al., 2022) The use of SUS allows researchers to quantitatively obtain an overview of user acceptance levels, ease of use, and the quality of user interaction with the application. Various previous studies also demonstrate that SUS is effective for evaluating the usability of digital applications and generating development recommendations that can improve service quality for users (P. Y. Pratiwi et al., 2023; Rafid Pratama et al., 2024) Therefore, the results of this study are expected to provide an overview of the usability level of the PERKASA application and serve as a basis for formulating development

recommendations for digital library services in Pamekasan Regency.

METHOD

1. Research Stages

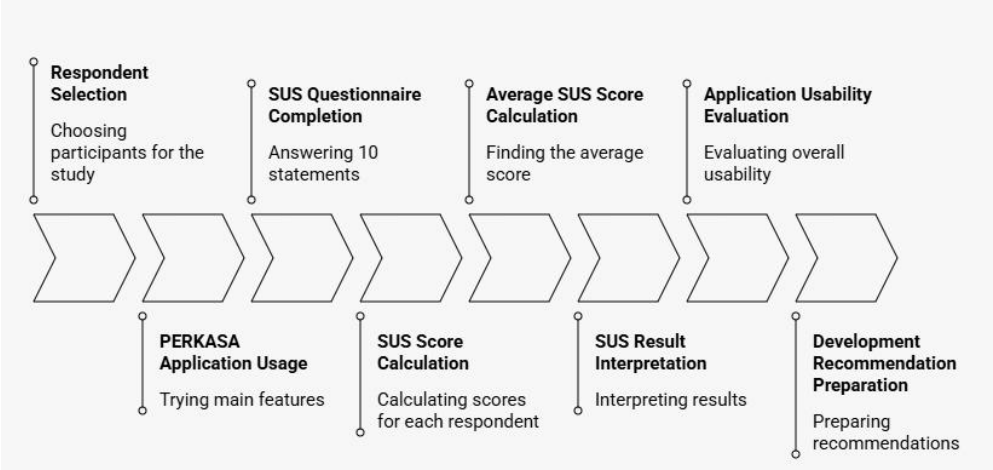


Fig. 1 Research Stages

This study initiated with the determination of respondents who are users of the PERKASA application. The selection of respondents was conducted using a purposive sampling technique, specifically choosing users who already had experience using the PERKASA application to ensure an objective assessment of the system's usability level. The criteria for respondents in this study were users who had accessed and used the application's core features, such as book searching, detailed book information, book recommendations, book borrowing, and user account management. A total of 62 respondents were involved in this study to provide an evaluation of the PERKASA application's usability.

Once the respondents were determined, each respondent was requested to use the PERKASA application by trying various available core features to ensure they gained adequate user experience before the evaluation process took place. Subsequently, respondents were asked to complete the System Usability Scale (SUS) questionnaire, which consists of 10 statements to measure their perceptions regarding the application's ease of use.

The data obtained from the questionnaires were then processed using the SUS calculation method to determine the usability score for each respondent. Following this, the average SUS score was calculated to ascertain the overall usability level of the application. The results obtained were then interpreted using the Acceptability Range, Grade Scale, and Adjective Rating frameworks to determine the user acceptance level of the PERKASA application. The final stage of the study involved formulating development recommendations based on the obtained usability evaluation results as an effort to improve the quality of digital library services

2. System Usability Scale (SUS)

The System Usability Scale (SUS) is a usability evaluation method developed by Brooke to measure user perceptions regarding the ease of use of a system. SUS is widely utilized because it features a simple, easy-to-administer instrument, and is capable of producing valid and reliable usability measurements across various types of information systems (Brooke, 1996). Furthermore, SUS can be used to obtain a general overview of the user acceptance level toward an application through a score ranging from 0 to 100 (Bangor et al., 2008).

In this study, the SUS method was employed to measure user perceptions of the usability of the PERKASA application. The SUS instrument consists of 10 standardized items using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Odd-numbered items are positively phrased, whereas even-numbered items are negatively phrased. The list of SUS items used in this study is shown in Table 1.

Table 1. System Usability Scale (SUS) Instrument

No	Item
1	I think that I would like to use this system frequently
2	I found the system unnecessarily complex
3	I thought the system was easy to use
4	I think that I would need the support of a technical person to be able to use this system
5	I found the various functions in this system were well integrated
6	I thought there was too much inconsistency in this system

7	I would imagine that most people would learn to use this system very quickly
8	I found the system very cumbersome to use
9	I felt very confident using the system
10	I needed to learn a lot of things before I could get going with this system

The calculation of the SUS score was performed by referring to the rules proposed by Brooke (1996). For odd-numbered items (1, 3, 5, 7, and 9), the score contribution is obtained by subtracting 1 from the user's response value. Meanwhile, for even-numbered items (2, 4, 6, 8, and 10), the score contribution is obtained by subtracting the user's response value from 5. All contribution scores are then summed and multiplied by a factor of 2.5, resulting in a total SUS score ranging from 0 to 100. The calculation of the SUS score is shown in Equation (1).

$$SUS = (\sum(X_i - 1) + \sum(5 - Y_i)) \times 2{,}5 \qquad (1)$$

X_i = The response scores for the odd-numbered items (Q1, Q3, Q5, Q7, and Q9).

Y_i= the response scores for the even-numbered items (Q2, Q4, Q6, Q8, and Q10).

The final SUS score ranges from 0 to 100, where a higher score indicates a better level of system usability.

The results of the SUS calculation are subsequently used to determine the usability level of the PERKASA application based on user perceptions. Score interpretation is conducted using the Acceptability Range, Grade Scale, and Adjective Rating categories to determine the user acceptance level and usability quality of the application.

3. SUS Data Analysis

The data obtained from the System Usability Scale (SUS) questionnaire were analyzed through several stages. The first stage involved calculating the SUS score for each respondent based on the rules proposed by Brooke (1996). For odd-numbered items (Q1, Q3, Q5, Q7, and Q9), the score contribution was obtained by subtracting 1 from the user's response score. Meanwhile, for even-numbered items (Q2, Q4, Q6, Q8, and Q10). the score contribution was calculated by subtracting the user's response score from 5. All score contributions were then summed and multiplied by a factor of 2.5 to yield a final SUS score ranging from 0 to 100.

The next stage was to calculate the average SUS score across all respondents to obtain an overview of the overall usability level of the application. In addition to the mean value, descriptive analysis was also utilized to identify trends in user perceptions regarding the ease of use of the PERKASA application.

The interpretation of the results was conducted using three approaches commonly employed in SUS evaluation: the Acceptability Range, Grade Scale, and Adjective Rating. The Acceptability Range was used to determine the level of system acceptance by users, the Grade Scale was applied to classify usability quality based on a letter-grade scale, while the Adjective Rating was utilized to describe usability perceptions in descriptive categories. The results of these interpretations were subsequently used as a foundation for formulating development recommendations for the PERKASA application.

RESULT

1. Description of the PERKASA Application

Based on Figure 2, the designed digital library application features several main functionalities that serve to assist users in searching, borrowing, saving, and managing book information digitally. Each feature has distinct functions and utilities tailored to meet user needs. The explanations for each feature are as follows:

a. Splash Screen

The Splash Screen is the initial interface displayed when the application is launched. This page functions as the application's identity by displaying the library logo, organization logo, and the name of the related institution. Additionally, this page serves as a transition interface before users are directed to the authentication page.

b. Login

The Login page is utilized for the user authentication process. Users can log into the system using their registered email address or Member Identification Number (Nomor Induk Anggota - NIA) along with their password. A Forgot Password feature is also available on this page to assist users who experience password loss.

c. Home

The Home page serves as the central hub for user activities within the digital library application. This page provides a search bar utilized to find books based on specific titles or keywords. Furthermore, users can view various book categories to facilitate the collection filtering process according to their needs. This page displays book recommendations and a list of popular books to help users discover engaging readings. At the bottom of the page, a main navigation menu is provided,

enabling users to easily switch to other features within the application. Through the Home page, users can search, browse, and select books they wish to read or borrow.

d. My Borrowings

The My Borrowings page is used to display a list of books currently borrowed by the user. The information presented includes the book title, borrowing date, return due date, and borrowing status. Additionally, this page provides a loan extension feature that allows users to extend the borrowing duration in accordance with applicable regulations. With this feature, users can monitor their book loan periods and avoid late returns.

e. User Profile

The User Profile page functions as a digital membership card that displays user account information. The available information includes the member's name, member identification number, membership type, registration date, and membership validity period. This page also provides a Logout button to exit the application, ensuring that user account security is maintained.

f. Book Details

The Book Details page is used to display comprehensive information regarding the book selected by the user. The displayed information comprises the book cover, title, rating or assessment, number of readers, and book synopsis. Moreover, a bookmark or favorite button is available, enabling users to save the book into their marked book list. This page helps users obtain more detailed information about a book before deciding to read or borrow it.

g. Forgot Password

The Forgot Password page is utilized to initiate the account recovery process when users cannot recall their passwords. On this page, users are prompted to enter their registered email address. Once the email is submitted, the system will send a verification code used to proceed with the account recovery process.

h. OTP Verification

After the verification code is sent to the user's email address, the system will direct the user to the OTP Verification page. On this page, users must enter the OTP (One-Time Password) code received via email as an identity verification step. This process aims to ensure that the account recovery request is made by the legitimate account owner.

i. Reset Password

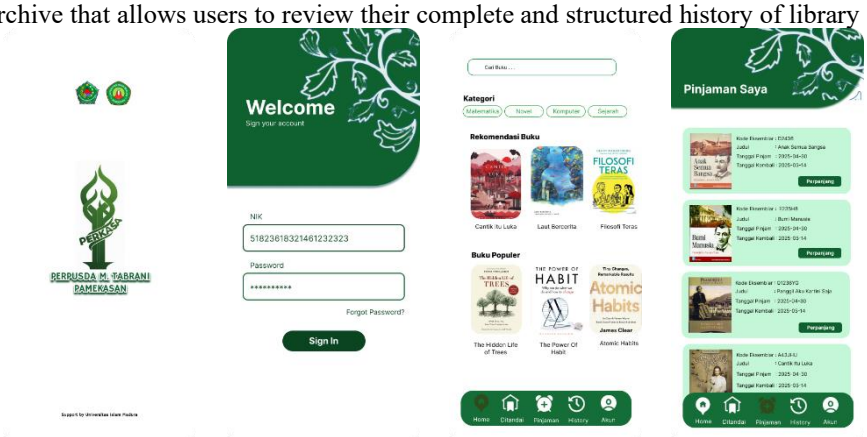
The Reset Password page is used to create a new password after the user successfully passes the OTP verification process. Users can enter and confirm the new password to be used for subsequent login processes. This feature helps users regain secure access to their accounts.

j. Bookmark

The Bookmark page functions to store a list of books that have been marked or bookmarked by the user. This feature makes it easier for users to relocate books they find interesting or wish to read and borrow in the future without having to perform a repetitive search.

k. Borrowing History

The Borrowing History page is used to display the complete record of borrowing activities previously conducted by the user. The available information includes the book title, borrowing date, return date, and borrowing status. This feature serves as a digital archive that allows users to review their complete and structured history of library service utilization.



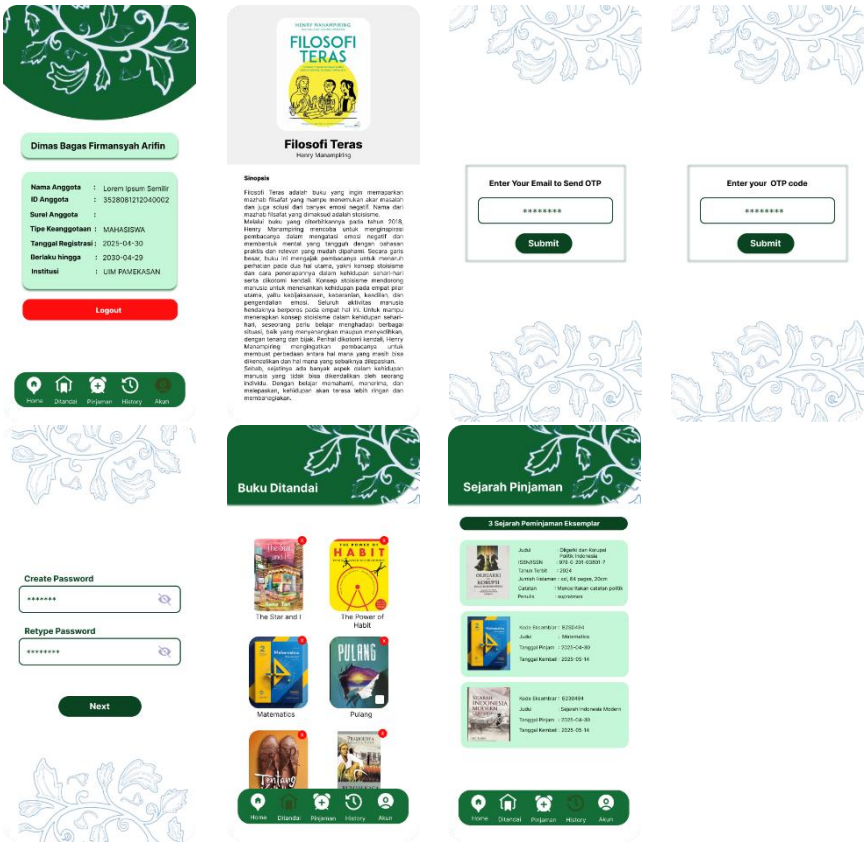


Fig. 2 The User Interface of the PERKASA Application

2. Usability Testing Results Using SUS

Usability testing was conducted with 62 respondents using the System Usability Scale (SUS) method. Each respondent was asked to evaluate the 10 SUS statements using a 1–5 Likert scale. Based on Table 2, the evaluation data from the 62 respondents for the 10 SUS statements were obtained. These data were subsequently converted according to the SUS calculation rules, which involved subtracting 1 from the scores of the odd-numbered statements (Q1, Q3, Q5, Q7, and Q9) and subtracting the response scores from 5 for the even-numbered statements (Q2, Q4, Q6, Q8, and Q10). The converted scores were then summed and multiplied by a factor of 2.5 to determine the individual SUS score for each respondent.

Table 2
SUS Calculation Results

Calculated Score										Total	Score (Total x 2.5)
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
0	4	0	4	2	2	4	4	2	0	22	55
3	2	3	3	3	3	3	3	3	3	29	73
3	4	3	3	3	2	3	3	3	3	30	75
4	4	4	4	4	4	4	4	4	4	40	100
2	3	3	3	3	3	3	4	3	2	29	73
2	1	3	1	2	2	3	3	3	0	20	50
4	0	2	2	2	2	2	1	3	1	19	48
3	4	4	3	3	1	4	3	3	0	28	70
3	3	3	3	3	4	3	3	3	3	31	78
3	4	3	3	4	4	3	4	3	3	34	85
4	0	4	0	4	0	4	0	4	0	20	50
4	0	4	0	4	0	4	0	4	0	20	50
3	2	2	1	3	3	2	2	2	0	20	50
3	2	3	2	1	3	2	3	2	1	22	55
3	3	1	4	4	1	3	3	2	4	28	70
3	1	4	4	1	3	4	4	1	0	25	63
2	3	2	1	2	2	2	1	3	2	20	50
3	3	4	4	0	4	3	3	4	4	32	80

3	3	3	3	3	3	3	3	3	3	30	75
2	3	2	3	1	3	1	2	1	2	20	50
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	2	3	3	3	3	3	2	28	70
3	3	3	3	4	4	3	3	3	2	31	78
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	3	3	3	3	3	2	29	73
3	3	3	3	3	4	3	3	3	2	30	75
3	3	3	3	3	4	2	3	3	2	29	73
3	3	3	3	4	4	3	3	3	2	31	78
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	4	4	3	3	3	2	31	78
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	4	4	3	3	3	2	31	78
3	3	3	3	4	4	3	3	3	2	31	78
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
4	0	3	0	3	1	4	0	4	0	19	48
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	3	4	3	3	3	2	30	75
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	4	4	3	3	3	2	31	78
3	3	3	3	3	4	3	3	3	2	30	75
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	3	3	3	3	3	2	29	73
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	4	4	3	3	3	2	31	78
3	3	3	3	4	4	3	3	3	2	31	78
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	4	4	3	3	4	4	3	2	33	83
3	3	3	3	4	4	3	3	3	2	31	78
2	2	2	2	2	2	2	2	2	2	20	50
Total											**4585**
Mean Score											**73,95**

Based on Table 2, the average score or the final System Usability Scale (SUS) result obtained is 73.95. After obtaining the SUS score, the next step is to determine the level of user acceptance toward the system based on the SUS score frameworks, which consist of the Acceptability Ranges, Grade Scale, and Adjective Rating.

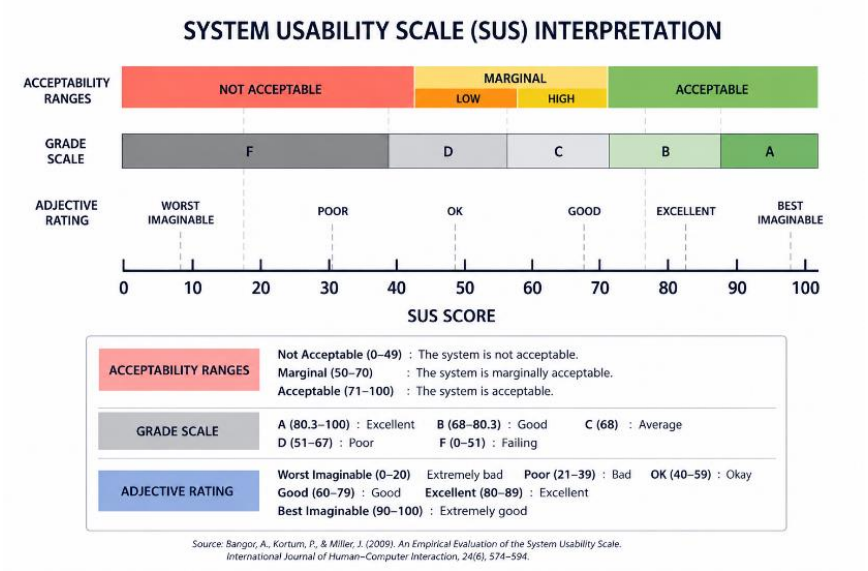


Fig. 3 System Usability Scale (SUS) Score Ranges

Based on Figure 2, the interpretation results of the System Usability Scale (SUS) score for the developed application are as follows:

a. Acceptability Ranges: Indicates that the application falls into the "Acceptable" category, meaning that the system is well-received and effectively utilized by users.
b. Grade Scale: Shows that the application achieved a "Grade B," signifying a good level of usability that stands above the standard SUS average.
c. Adjective Rating: Demonstrates that the application is categorized as "Good," implying that users provided positive assessments regarding the system's ease of use, efficiency, and interaction comfort.

Based on these interpretation results, it can be concluded that the developed application possesses a good level of usability and successfully fulfills user requirements. This is evidenced by the SUS score of 73.95, which surpasses the standard benchmark average of 68, thereby declaring the system feasible and acceptable for deployment.

DISCUSSION

The evaluation results using the System Usability Scale (SUS) indicated that the PERKASA application achieved an average score of 73.95. Based on the SUS interpretation frameworks, this score falls within the "Acceptable" category, obtains a "Grade B," and is positioned in the "Good" rating. These findings demonstrate that the PERKASA application possesses a solid level of usability and is well-accepted by users in supporting information retrieval, book borrowing, and digital library service management activities. According to Hyzy, SUS is a well-established instrument used to measure user perceptions regarding the ease of use of a system through scores ranging from 0 to 100, remaining one of the most widely applied usability evaluation methods due to its validity and ease of application. Based on a meta-analysis conducted by Hyzy, a SUS score of 68 continues to serve as the standard benchmark average in various usability evaluations of digital systems (Hyzy et al., 2022). Furthermore, a systematic mapping study by Yani revealed that SUS remains a highly preferred usability evaluation method due to its simple, reliable nature and its ability to provide a comprehensive overview of user acceptance toward a system (Yani et al., 2025).

The SUS score of 73.95 obtained in this study surpasses the standard SUS average, thereby indicating that the PERKASA application has successfully met user expectations regarding ease of use and interaction comfort. This finding aligns with a study by Pratiwi on digital library systems, which suggested that a SUS score above 70 indicates a good usability level and user acceptance (P. Y. Pratiwi et al., 2023). Similar results were also reported by Romadoni, who achieved a SUS score of 78 on a library information system, categorizing it as both "Good" and "Acceptable." Consequently, the results of this study indicate that the usability level of the PERKASA application is comparable to various digital library systems previously evaluated using the SUS method (Romadoni et al., n.d.).

This high level of usability indicates that the majority of users can comprehend and utilize the core features of the application without significant difficulties. Features such as book searching, book details, bookmarks, borrowing history, and account management provide convenience for users in accessing library services digitally. This finding is consistent with research by Weichbroth, which states that usability perception in mobile applications is heavily influenced by navigation ease, feature efficiency, and interface interaction quality. Additionally, a study by Galavi demonstrated that ease of use, effectiveness, efficiency, and user satisfaction are critical factors determining the successful implementation

of digital applications from the user's perspective (Galavi et al., 2024; Weichbroth, 2024).

Nevertheless, the obtained SUS score has not yet reached the "Excellent" category, which typically requires a score above 80. This condition implies that opportunities for refinement still exist to further enhance the user experience. Several aspects that warrant developers' attention include improving the accuracy of the book search feature, refining user interface consistency, developing more personalized recommendation features, and implementing return reminder notifications. Recent research on mobile application usability highlights that information architecture quality, interface design, system performance, and user interaction patterns are the most influential factors driving an application's usability perception (Weichbroth, 2024). Therefore, continuous development focusing on these dimensions has the potential to elevate user experience quality and boost the application's usability score in future evaluations.

Overall, the findings of this study show that the PERKASA application has established a strong usability foundation and effectively fulfills user needs in accessing digital library services. Nonetheless, continuous improvement through feature refinement, interface enhancements, and personalized services remains essential to deliver a more optimal user experience and drive long-term user satisfaction. These findings reinforce the importance of periodic usability evaluations as an integral part of a user-centered design (UCD) development process, ensuring that digital service quality continuously evolves alongside growing user needs.

CONCLUSION

This study aimed to evaluate the usability level of the PERKASA application using the System Usability Scale (SUS) method. The evaluation results from 62 respondents indicated that the PERKASA application achieved a SUS score of 73.95. Based on the SUS interpretation frameworks, this score falls into the "Acceptable" category, obtains a "Grade B," and is positioned in the "Good" rating, demonstrating that the application is well-accepted and effectively utilized by users. The score, which surpasses the standard benchmark average of 68, indicates that the application successfully satisfies the aspects of ease of use, efficiency, and user interaction comfort. These findings reveal that the features available in the PERKASA application are capable of effectively supporting user needs in accessing digital library services.

The results of this study provide practical contributions for developers and digital library managers as a baseline for evaluating and enhancing the quality of mobile application-based services. Future work could combine the SUS method with other usability evaluation methods, such as Heuristic Evaluation or the User Experience Questionnaire (UEQ), to obtain a more comprehensive analysis of user experience quality.

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