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User Satisfaction level of Self-lending Machine using the End User Computing Satisfaction (EUCS) Model at the National Library of the Republic of Indonesia

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Abstract

Libraries have undergone significant transformation from manual systems to automated services as part of advances in information technology. One innovation in circulation services is the implementation of self-lending machines to improve efficiency and user independence. This study aims to evaluate user satisfaction with self-lending machines at the National Library of the Republic of Indonesia using the End User Computing Satisfaction (EUCS) model, which consists of five dimensions: content, accuracy, format, ease of use, and timeliness. This research employes a quantitative approach with a descriptive method. Data were collected through questionnaires distributed to 86 respondents selected using purposive sampling. The results show that overall user satisfaction is categorized as "very satisfied", with an average score of 3.44. the content, accuracy, format, and ease of use dimensions obtained high mean scores, while timeliness recorded the lowest score and was categorized as "satisfied". These findings indicate that users generally have a positive perception of the system in supporting borrowing activities, although system responsiveness remains a key area for improvement. This study emhasizes the importance of continuous evaluation of self-service library system to enhance service quality and improve user-oriented digital library services.

Keywords—*self-lending machine, End User Computing Satisfaction model, user satisfaction, library automation, information systems*

1. Introduction

The development of information technology has brought significant changes across various sectors, including public service delivery. The utilization of information technology not only improves work efficiency but also transforms how institutions deliver services to society. Digital transformation has also influenced public information services, encouraging service providers to develop more efficient systems aligned with user needs (Natika, 2024). This development is reflected in digital-based services that enable users to access information more quickly, conveniently, and without spatial or temporal limitations.

These changes have also affected libraries as public information institutions. Libraries are no longer limited to repositories of pronted materials but have evolved into information service centers that integrate technology to meet user needs. In response to the growing development of dogotal information technology, library digitalization has become an essential effort to maintain relevance. Habib et al. (2025) stated that the transformation of library services based on information technology can improve service efficiency and provide better access to data and information for users.

In the digital transformation era, libraries are required to continously innovate their service in order to adapt to changing user behavior and increasingly complex information needs. The rapid advancement of technology encourages libraries to develop services and requires librarians to adapt and enhance their competencies in providing user-centered services (Abidin & Eriyadi, 2024). With the support of information technology, libraries are able to provide faster and more accesible services through library automation systems, digital services, and self-service facilities (Pane, 2023).

The National Library of the Republic of Indonesia, as the national-level library institution, has also implemented various technological innovations in its services. In additon to managing national collections, the National Library has developed technology-based service to improve service quality for users (Safitri et al., 2025). Also, Hazan and Ayub (2024) emphasized that the use information technology can improve accessibility, efficiency, and the quality of library services. This is also supported by Undang-Undang Nomor 43 Tahun 2007 Tentang Perpustakaan, which states that library development must be carried out in accordance with user and community meeds by utilizing information and communication technology.

Various technology-based innovations have been developed by the National Library of the Republic of Indonesia to optimize services in response to challenges in accessing information in digital era (Utami, 2022). One of these innovations is the self-service circulation system through self-lending machines, which allow users to borrow library collection independently without direct assistance from librarians (Ritonga, 2022). This system aims to improve circulation efficiency and provide greater flexibility for users in accessing library services.

In practice, the implementation of self-lending machines is not free from challenges. Technology availability does not automatically guarantee optimal utilization by users in practice. Usage data from self-lending machines at the National Library of the Republic of Indonesia indicate a fluctuation in the number of transactions, with a decline from 336 users in october 2025 to 140 users in November 2025, followed by an incrase to 152 users in December 2025. Some users still prefer borrowing through librarians instead of using the self-lending machines. Several users also experience difficulties during the operation process, particularly during membership card scanning or collection identification. These conditions indicate a gap between the intended purpose of self-lending machines and their actual use in practice, which may influence user satisfaction.

User satisfaction is an important indicator in evaluating the success of information systems, as it reflects the extent to which a system meets user needs and expectations (Aswidani, 2024). In the library context, information systems not only support collection management but also service delivery, including self-service circulation. Therefore, service success is determined not only by system availibility but also by the extent to which it meets user satisfaction in terms of convenience and effectiveness (Nur Fauzi et al., 2022).

Previous studies have shown that the quality of information systems significantly influences user satisfaction. Azizah and Wanastri (2024) reported that users still face difficulties understanding system procedures and access limitations. Furthermore, Jannatuzzahra et al. (2025), found that system quality, ease of use, and information accuracy significantly influence user satisfaction

Based on the above discussion, self-lending machine play an important role in supporting technology-based library services. However, the success of such systems is not only determined by tecnological availability but also by user satisfaction. Therefore, this study aims to measure the level of user satisfaction with self-lending machines at the National Library of the Republic of Indonesia using the End User Computing Satisfaction Model as an evaluation framework.

2. Method

This study employes a quantitative approach with a descriptive method. Quantitative research is a structured approach that processes numerical data to describe phenomena and enable generalization (Kurniawan & Puspitaningtyas, 2023). The descriptive method is used to provide

a systematic and accurate description of the research data obtained (Aziza, 2023). This study aims to analyze the level of user satisfaction with the self-lending machine using the End User Computing Satisfaction (EUCS) model at the National Library of the Republic of Indonesia.

The object of this research is the self-lending machine service at the National Library of the Republic of Indonesia, while the research subjects are library users who have utilized the self-lending machine. The research was conducted at the National Library of the Republic of Indonesia from October 2025 to Desember 2025.

Table 1. Users Self-lending Machine.

No.	Month	Number of Users
1.	October 2025	336
2.	November 2025	140
3.	Desember 2025	152
	Total	628

Based on Table 1, the population in this study consists of all users who utilized the self lending machine service during the research period, totaling 628 users based on the INLISlite database of the National Library of the Republic of Indonesia.

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{628}{1 + 628\ (0{,}1)^2}$$

$$n = \frac{628}{1 + 6{,}28}$$

$$n = \frac{628}{7{,}28}$$

$n = 86{,}2$ = 86 Sample

The sample was determined using the Slovin formula with margin of error of 10% respondents, resulting in a sample size of 86 respondents. The sampling technique used in this study is purposive sampling, where respondents are selected based on specific criteria (Syamsul et al., 2023). The selection of this sampling technique was selected because not all users of the National Library of the Republic of Indonesia utilize the self-lending machine, whereas this study specifically focuses on measuring the satisfaction level of users who have experienced the service.

2.1 Variable and Instrument

The research instrument used in this study was a questionnaire designed based on the End User Computing Satisfaction (EUCS) model developed by Doll & Torkzadeh (1988).

Table 2. Questionnaire Indicators for the Utilization of the Self-lending Machine Using the EUCS Model.

Dimensions	Indicators	Number of items
Content	Completeness of information	1-4
Accuracy	Information accuracy	5-8
Format	System display/interface	9-12
Ease of Use	Ease of system operation	13-16
Timeliness	Speed and timeliness of information	17-20

Table 2 shows the EUCS consists of five dimensions: content, accuracy, format, ease of use, and timeliness. The questionnaire contained 20 statement items measured using a four-point Likerts scale consisting of strongly agree, agree, disagree, and strongly disagree.

This study empoyes two types of data, namely primary data and secondary data. Primary data in this study are obrained directly from respondents through the distribution of questionnaires to library users who utilized the self-lending machine at the National Library of the Republic of Indonesia. Meanwhile, secondary data are collected through a literature review by examining books, scientific journals, articles, and other reference sources relevant to the research topic.

2.1.1 Validation Test

The validity and reliability of the research instrument were tested prior to data analysis. The validity data test was conducted using the Pearson Product Moment correlation by correlating each item score with the total score. An item is considered valid if the value of r count is greater than r table at a significantly level of 0.05.

Table 3. The Validity Test of the Questionnaire.

No.	r count	r table	Validity
1.	0.643	0.212	Valid
2.	0.632	0.212	Valid
3.	0.674	0.212	Valid
4.	0.590	0.212	Valid
5.	0.446	0.212	Valid
6.	0.467	0.212	Valid
7.	0.462	0.212	Valid
8.	0.525	0.212	Valid
9.	0.676	0.212	Valid
10.	0.620	0.212	Valid
11.	0.705	0.212	Valid
12.	0.663	0.212	Valid
13.	0.702	0.212	Valid
14.	0.663	0.212	Valid
15.	0.609	0.212	Valid
16.	0.318	0.212	Valid
17.	0.457	0.212	Valid
18.	0.243	0.212	Valid
19.	0.362	0.212	Valid
20.	0.413	0.212	Valid

The validity test in Table 3 shows that all items have positive correlation coefficients with significance values below 0.05. the correlation coefficients range from 0.243 to 0.705, indicating that all questionnaire items are valid. Therefore, all items are considered appropiate and suitable for further data analysis in this study.

2.1.2 Reliability Test

The reliability test was conducted using Cronbach's Alpha. A variable is considered reliable if the Cronbach's Alpha value is greater than 0.60.

Table 4. Reliability Test Results.

Variabel	Alpha Cronbach	Status
End User Computing Satisfaction Model	0.832	Reliable

The realibility test in Table 4 shows a value of 0.832 for 20 items. The results of the validity and reliability tests indicate that all questionnaire items are valid and reliabel, thus suitable for use in this study.

2.2 Data collections

Data collections was carried out using an online questionnaire distributed through Google Forms. The questionnaire link was shared with respondents via Gmail and WhatsApp to facilitate participation and accelerate the data collection process.

The collected data view analyzed using descriptive statistical analysis. The analysis process includes data checking, tabulation, and calculation of the mean score for each statement item. The mean score was calculated using a Likert scale with scores ranging from 1 to 4. The results were then categorized infto four levels of satisfaction: very satisfied (3.25-4.00), satisfied (2.50-3.24), dissatisfied (1.75-2.49), and very dissatisfied (1.00-1.74).

3. Results And Discussion

3.1 Results

This study analyzed user satisfaction toward the self-lending machine using the End User Computing Satisfaction (EUCS) model. User satisfaction is used as an indicator to evaluate how well the system meets user needs and expectations.

The indicators in this study were analyzed using descriptive statistical analysis. The frequency of each response was multiplied by the corresponding Likert scale score to obtain the total score. The results are presented based in the five EUCS dimensions: content, accuracy, format, ease of use, and timeliness.

3.1.1 Content

The content dimension relates to the quality to the information produced by an information system. High-quality information is able to provide a comprehensive overview and assist users in understanding the data or conditions presented by the system (Srimulyo et al., 2024). This aspect measures the extent to which the information presented is complete, relevant, and aligned with user needs (Wulandari et al., 2025). The more complete and relevant the information provided, the higher the perceived information quality from the user's perspective.

Table 6. The Results of Content Dimension.

No.	Question	Scores
1.	The self-lending machine provides complete information regarding the borrowing process	3.64
2.	The information displayed meets my needs during the borrowing transaction	3.74
3.	The instructions provided on the self-lending machine screen are easy to understand	3.67
4.	The information provided helps me ensure that the borrowing process has been carried out correctly	3.63
	Total	14.09
	Score	14.09/4 = 3.67 (Very Satisfied)

In the content dimension, the mean scores range from 3.63 to 3.74, with an overall average of 3.67, which falls into the "very satisfied" category. These reults indicate that the information provided by the system is perceived as complete, relevant, and aligned with user needs. This suggest that quality plays a significant role in shaping user satisfaction toward the system.

3.1.2 Accuracy

The accuracy dimension refers to the level correctness and reliability of the information generated by the system. It evaluates the extent to which the system's output is free from errors and can be trusted by users (Wang et al., 2023). Innacurate data may lead to misunderstanding and reduce users trust in the system. Therefore, accuracy is a crucial element in assessing the quality of information produced by an information system (Aini & Nasution, 2025).

Table 7. The Results of Accuracy Dimension.

No.	Question	Scores
5.	The title and collection details displayed correspond to the book while scanned	3.79
6.	The system accurately records the number of items borrow without errors	3.76
7.	During use, the system rarely encounters errors in processing transactions	3.33
8.	Information regarding the due date for returning borrowed items is displayed accurately	3.80
	Total	14.67
	Score	14.67/4 = 3.66 (Very Satisfied)

In the accuracy dimension, the mean scores range from 3.33 to 3.80, with an overall average of 3.66, categorized as "very satisfied." This indicates that users generally perceive the system as reliable and capable of producing accurate transaction information.

3.1.3 Format

The format dimension concerns the visual appearance and layout of the information presented by the system (Maulana et al., 2025). According to Soedirdjo et al. (2025), this aspect includes screen layout organization, text readability, the use of clear symbols or icons, and an easily understandable menu structure. A well-designed, simple, and intuitive format enables users to quickly comprehend information without confusion, thereby enhancing user comfort (Oktaroza & Setiawan, 2025).

Table 8. The Results of Format Dimension.

No.	Question	Scores
9.	Visual elements on the screen (text and icons) are displayed clearly and are not confusing	3.56
10.	The screen display has sufficient contrast, making it easier to read information on self-lending machine	3.55
11.	The interface design gelps me understand the borrowing process flow	3.57
12.	The menu structure on self-lending machine is well organized, making it easier to carry out borrowing transactions	3.58
	Total	14.26
	Score	14.26/4 = 3.56 (Very Satisfied)

The format dimension shows mean scores range from 3.55 to 3.58, with an overall average of 3.56, indicating a "very satisfied" category. This demonstrates that users perceive the system interface as visually clear and easy to understand. These finding indicate that a well-designed interface supports user engagement and reduces cognitive effort when interacting with the system.

3.1.4 Ease of Use

The ease of use dimension measures how easily the system can be operated by isers. It encompasses the clarity of instructions, ease of navigation, and simplicity of procedures in using system features (Lambe et al., 2025). A higher level of ease of use has a positive impact on improving user comfort and overall user experience (Azhar et al., 2025).

Table 9. The Results of Ease of Use Dimension.

No.	Question	Scores
13.	The self-lending machine is easy to learn to use	3.67
14.	I can use the self-lending machine without assistance from a librarian	3.57
15.	The stepps in the borrowing transaction displayed on the screen are clear and not confusing to follow	3.59
16.	I still experience difficulties when using the self-lending machine	2.37
	Total	13.21
	Score	13.21/4 = 3.30 (Very Satisfied)

However, in the ease of use dimension, the mean scores vary significantly from 2.37 to 3.67, with an overall average of 3.30, categorized as “very satisfied.” This variation indicates that user experiences are not entirely uniform. This discrepancy implies that ease of use is not fully optimized for all users, particularly new or less experienced users. Therefore, although the system is perceived as generally usable, certain aspects still require improvement to ensure consistent usability and maximize system utilization to influence user satisfaction.

3.1.5 Timeliness

The timeliness dimension evaluates the system’s ability to process and deliver information promptly. It assesses both the speed of data processing and the timeliness of information presentation (Aziz et al., 2024). A responsive system that operates without delays enhances service efficiency and increases user satisfaction (Aprilia et al., 2023).

Table 10. The Result of Timeliness Dimension.

No.	Question	Scores
17.	The self-lending machine responds quickly to commands	3.55
18.	The borrowing process through the self-lending machine often takes a long time	2.27
19.	The self-lending machine experiences disruptions that slow down the borrowing process	2.95
20.	Using the self-lending machine makes the borrowing process faster compared to using a librarian	3.41
	Total	11.98
	Score	11.98/4 = 2.99 (Satisfied)

The timeliness dimension shows mean scores ranging from 2.27 to 3.41, with an overall average of 2.99, categorized as “satisfied.” Compared to other dimensions, this is the lowest scoring aspect. These findings suggest that system speed and responsiveness remain key limitations. Even though users are generally satisfied with other aspects, delays and technical interruptions are still the main limitations affecting user satisfaction. Improving system

performance, particularly in terms of speed and stability, is therefore essential to enhance user satisfaction.

3.2 Discussion

The results of this study indicate that the utilization of the self-lending machine, as assessed using the End User Computing Satisfaction (EUCS) model, falls into the "very satisfied" category, with an average score of 3.44. This finding suggests that, overall, users have a positive perception of the system in the borrowing process.

When anlyzed by dimension, the highest scores are found in the content, accuracy, and format dimensions, indicating that the information provided by the system is considered complete, clear, and accurate according to users needs. Additionally, the ease of use dimension also shows a high score, suggesting that the system is relatively easy to understand and operate. This reflects that, from a user experience perspective, the system has succesfully supported users in conducting borrowing activities.

However, the timeliness dimension shows a compratively lower score, categorized as "satisfied". This indicates that users still experience certain issues related to system responsiveness and processing time. Although the system performs well in terms of information quality and usability, the efficiency aspect still requires improvement.

This finding is further supported by user's feedback, which highlights several technical and operational issues, such as system errors, slow responses times, the requirement to enter passwords that slows down the process, and the limited number of machines leading to queues. Additionally, some users reported system inconsistencies, such as security alarms being triggered even after completing the borrowing process. These issues suggest that although the system performs well in terms of information quality and usability, technical performance still needs improvement to enhance overall user satisfaction.

4. Conclusions

This study concludes that user satisfaction with the self-lending machine, as measured using the End User Computing Satisfaction (EUCS) model, is categorized as very satisfactory. This indicates that the system has been effectively implemented in supporting library service and is able to meet user needs in general. Among the five EUCS dimensions, content, accuracy, format, and ease of use contribute positively to user satisfaction, as users perceive the system as informative, reliable, and relatively easy to use. However, the timeliness dimension shows the lowest performance, indicating limitations in system responsiveness and processing speed that may affect overall user satisfaction.

Despite the overall positive results, this study has limitations, as it focuses solely on user satisfaction without incorporating actual system usage data or other influencing factors. Therefore, the findings represent users perceived evaluation rather than objective usage behavior.

Based on the results and user feedback, several improvements are recommended, including enhancing system responsiveness, reducing technical errors, simplifying access procedures, and increasing the availability of self-lending machines to reduce queues. Additionally, clearer usage instructions and system notifications are suggested to improve user experience.

In conclusion, this study confirms that user satisfaction can serve as an indicator of system effectiveness from a perceptual perspective, although it does not fully represent actual system utilization. Future research is recommended to integrate EUCS-based satisfaction measures with objective usage data to provide a more comprehensive evaluation of self-service library systems.

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