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Evaluation of Environmental Fee Management Information System Using User Acceptance Test

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ABSTRACT

The management of environmental fees in residential areas requires an information system that is capable of supporting accurate transaction recording and transparent information delivery. Previously, Sunderland Jambi Housing Estate managed environmental fee administration using a manual system, which potentially caused recording errors, data inconsistency, and delays in information dissemination to residents. These limitations reduced the effectiveness and transparency of financial management processes. This study aims to evaluate the implementation of a web-based Environmental Fee Management Information System (SIM-IPL) at Sunderland Jambi Housing Estate. The research method applied is descriptive with a case study approach. Data were collected through observation, interviews, and questionnaires distributed to 20 active system users. System testing was conducted using Black Box Testing and User Acceptance Test (UAT) methods. The results of Black Box Testing indicate that all main system functionalities, including user authentication, transaction processing, data management, and financial reporting, operate according to the specified functional requirements. Furthermore, the UAT results show an overall average score of 4.88 or 97.6%, which is categorized as excellent. These results demonstrate that SIM-IPL is easy to use, improves financial information transparency, and provides a high level of user satisfaction. Therefore, it can be concluded that the web-based SIM-IPL is feasible and effective for supporting environmental fee management at Sunderland Jambi Housing Estate and can serve as a reference for similar residential financial management systems.

INTRODUCTION

The rapid development of information technology has encouraged organizations to utilize information systems to support operational activities and decision-making processes. The use of information systems has become increasingly important as it can enhance effectiveness, efficiency, and accuracy in data management. One application of information systems can be found in the management of environmental fees in residential areas.

In practice, environmental fee management in residential areas is still often conducted manually. This condition has the potential to cause various problems, such as delays in payment recording, data processing errors, and a lack of transparency in the information received by residents. These issues may lead to a decrease in residents' trust in environmental fee management. Therefore, the implementation of information systems that align with organizational needs is expected to improve the effectiveness and efficiency of data management while providing better information transparency for both administrators and residents (Azizah et al., 2024).

Management Information Systems (MIS) are systems designed to collect, store, process, and present information required to support decision-making and organizational control. MIS integrates human resources, technology, data, and work procedures to achieve organizational goals more effectively and efficiently (Albadri et al., 2024). In the context of environmental fee management, the implementation of MIS is expected to improve data accuracy, simplify fee management processes, and provide clear and structured information to residents (Purnama et al., 2024). Conversely, when environmental fee management is not supported by an adequate information system, the information available to residents tends to be unclear and difficult to access, thereby reducing transparency and diminishing residents' trust. Previous studies have shown that transparency and accountability in information management significantly influence public trust, as users can more easily understand and verify available information when information systems are effectively implemented(Azizah et al., 2024).

Sunderland Jambi Housing Estate has implemented a Web-based Environmental Fee Management Information System (SIM-IPL) to improve the environmental fee management process. However, the implementation of an information system should not only be assessed from a functional perspective but also evaluated based on user perceptions and acceptance. System evaluation is essential to determine whether the system is easy to use, acceptable, and provides tangible benefits to users. Studies by (Andriani, 2020)and (Feishal Azriel Arya Putra et al., 2025) indicate

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that system evaluation based on user perceptions provides a clear overview of system acceptance and usability levels. Furthermore, (Aziz & Prayoga, 2025) emphasize that usability plays a crucial role in determining the success of information system implementation.

Based on the above background, this study aims to analyze the implementation of the Environmental Fee Management Information System (SIM-IPL) at Sunderland Jambi Housing Estate based on user perceptions using the User Acceptance Test (UAT) method. The research focuses on the level of system usability, information transparency, and user satisfaction in supporting environmental fee management.

This study is expected to contribute academically to the field of information systems, particularly regarding the evaluation of information system implementation using the User Acceptance Test (UAT) method. Practically, the results are expected to serve as evaluation material for the management of Sunderland Jambi Housing Estate to improve the quality of SIM-IPL. For system users, this study is expected to enhance comfort and satisfaction in using the system. Additionally, this research may serve as a reference or comparative study for future researchers conducting similar research.

To ensure the research remains focused, the scope of this study is limited to evaluating the implementation of SIM-IPL at Sunderland Jambi Housing Estate. The evaluation emphasizes user acceptance using the User Acceptance Test (UAT) method based on user perceptions. The assessment aspects include usability, information transparency, and user satisfaction. The respondents in this study are limited to 20 active SIM-IPL users.

LITERATURE REVIEW

A system is defined as a network of interrelated procedures that work together in an integrated manner to perform specific activities and achieve predetermined objectives (Susanti, 2021). The existence of a system enables an organization to operate in a structured and coordinated way in order to accomplish its goals efficiently.

An information system is a component of an organizational system consisting of interacting elements that function to manage data and produce useful information. Information systems play an important role in accelerating data processing activities and improving the efficiency and accuracy of information outputs (Purnama et al., 2022). According to Pujiastuti et al. (2021), an information system is a system within an organization that supports daily transaction processing, operational activities, managerial functions, and strategic decision-making, while also providing necessary reports for internal and external stakeholders. In general, an information system is designed to collect, process, store, and present information to support organizational operations and decision-making processes (Azis, 2022).

A Management Information System (MIS) is a specialized form of an information system that is developed to support managerial activities. MIS provides relevant, accurate, and timely information to assist management in planning, controlling, and decision-making processes (Rozaq, 2020).

In information system development, testing is a critical phase to ensure that the system meets user requirements. User Acceptance Test (UAT) is a testing method used to evaluate the extent to which a system is accepted by users based on their direct experience during system usage (Wulandari Putri Bahmin et al., 2025). UAT assesses factors such as system usability, functional suitability, and user satisfaction (Aliyah et al., 2024). A high level of user acceptance indicates that the system has successfully met user needs and expectations (Wulandari Putri Bahmin et al., 2025).

In addition to UAT, functional testing is required to verify that all system features operate according to predefined specifications. Black Box Testing is a software testing method that focuses on evaluating system functionality based on inputs and outputs without considering the internal structure of the program (Pratama et al., 2023). This testing method is widely applied to ensure the reliability and stability of information systems prior to full-scale implementation (Setiana et al., 2024).

METHOD

This study employs a descriptive research method with a case study approach. The descriptive method is used to describe the actual conditions of the research object, while the case study approach aims to obtain an in-depth understanding of the implementation of SIM-IPL in a real-world context at Sunderland Jambi Housing Estate.

The research object is the Environmental Fee Management Information System (SIM-IPL), which is utilized to support environmental fee data management, financial report generation, and transparent information dissemination to residents.

Data collection techniques include observation, interviews, and questionnaires. Observation is conducted through direct examination of system usage to identify workflows, utilized features, and potential issues. Interviews are conducted with housing management and system administrators to obtain information regarding fee management processes, system requirements, and system evaluation. Questionnaires are distributed to 20 active SIM-IPL users to measure user acceptance and satisfaction.

System testing is conducted using Black Box Testing and User Acceptance Test (UAT) methods. Black Box Testing is used to ensure that each system function operates according to user requirements by focusing on input-output conformity. Meanwhile, UAT is conducted by distributing questionnaires using a five-point Likert scale ranging from

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strongly disagree to strongly agree.

The assessment aspects in the User Acceptance Test include usability, information transparency, and user satisfaction. Data analysis is performed by calculating the percentage of user acceptance by comparing the total actual score obtained from respondents' answers with the maximum possible score and multiplying it by one hundred percent. The evaluation categories are determined based on the average score of respondents' answers, as presented in Table 1.

Table 1. User Acceptance Test Assessment Criteria

Average Score	Category
4,21 – 5,00	Excellent
3,41 – 4,20	Good
2,61 – 3,40	Fair
1,81 – 2,60	Poor
1,00 – 1,80	Very Poor

RESULT

The Environmental Fee Management Information System (SIM-IPL) is an application-based system implemented to support the management of environmental fees at Sunderland Jambi Housing Estate. The system is designed to assist administrators in recording income and expenditure transactions, managing data, and presenting financial reports in a structured and transparent manner. The implementation of SIM-IPL aims to replace the previously used manual fee management process, which had the potential to cause recording errors and delays in information delivery.

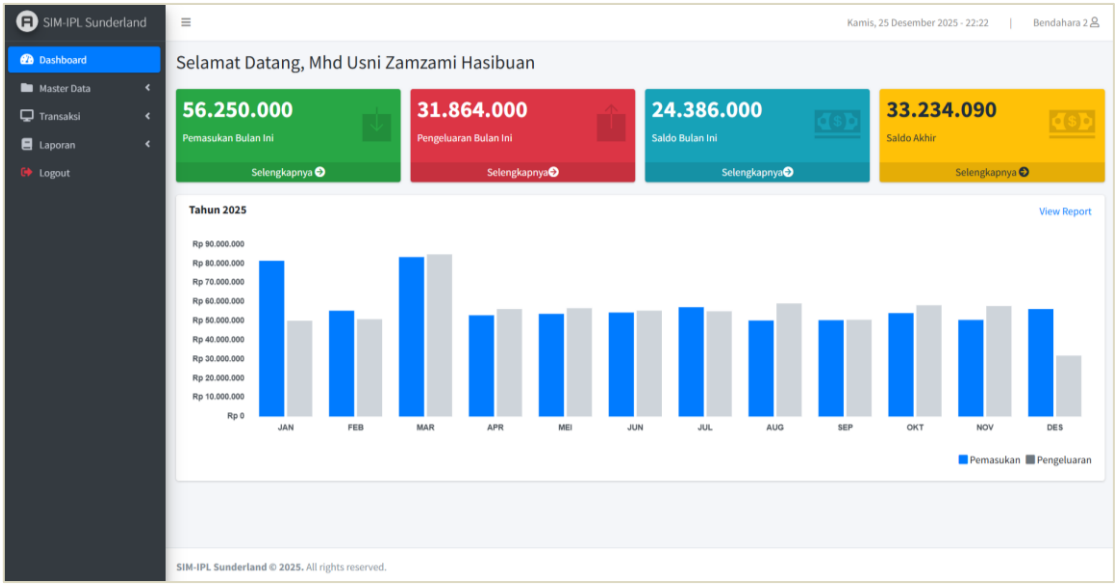

Figure 1. SIM-IPL Dashboard Interface of Sunderland Jambi Housing Estate

The main system interface is displayed through the SIM-IPL dashboard, which functions as the central information hub for environmental fee management. The dashboard presents real-time financial summaries, including total monthly income, total monthly expenditure, current monthly balance, and the final balance accumulated from recorded transactions. In addition to numerical information, the system also provides graphical visualizations of monthly income and expenditure over a one-year period to facilitate financial monitoring.

Functional system testing was conducted using the Black Box Testing method to ensure that all SIM-IPL functions operate in accordance with the defined functional requirements. The testing covered user authentication, dashboard functionality, master data management, income transactions, expenditure transactions, and financial reporting features. The results indicate that all primary system features functioned successfully and met system specifications, as presented in Table 2.

Table 2. Black Box Testing Results

No	Tested Feature	Test Scenario	Result	Description
1	Login & Logout	User logs in and logs out of the system	Successful	Valid
2	Dashboard	Displays summary information	Successful	Valid
3	Master Data	Master data management	Successful	Valid
4	Income Transaction	Input of environmental fee income	Successful	Valid
5	Expenditure Transaction	Input of expenditure data	Successful	Valid
6	Reports	Display and print financial reports	Successful	Valid

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Based on the results presented in Table 2, all tested features of the SIM-IPL system successfully met the expected functional requirements. The login and logout feature functioned properly, ensuring secure user authentication and session management. The dashboard feature was able to display financial summary information accurately, providing users with real-time insights into environmental fee management.

Furthermore, the master data management feature operated as intended, allowing administrators to manage system data efficiently. The income and expenditure transaction features successfully recorded financial transactions without errors, supporting accurate and transparent financial data processing. In addition, the reporting feature was able to display and print financial reports correctly, enabling effective financial evaluation and documentation.

Overall, the Black Box Testing results confirm that the SIM-IPL system functions reliably and in accordance with its design specifications. This indicates that the system is technically feasible and ready to be used to support environmental fee management activities at Sunderland Jambi Housing Estate.

In addition to functional testing, user acceptance evaluation was conducted using the User Acceptance Test (UAT) method. This evaluation involved 20 respondents who are active SIM-IPL users. The assessment was carried out using a five-point Likert scale and focused on three main aspects: ease of use, information transparency, and user satisfaction. The research instrument consisted of ten questionnaire items designed to capture user perceptions of the system, as shown in Tables 3 and 4.

Table 3. User Acceptance Test Questionnaire Items

Code	Statement
P1	The SIM-IPL application is easy to understand when first used
P2	The menus and navigation of the SIM-IPL application are easy to use
P3	The application interface is neat and comfortable
P4	The login process and feature access run smoothly
P5	The income and expenditure recording features function properly
P6	The displayed financial data and reports are accurate
P7	The SIM-IPL application improves financial management transparency
P8	The application runs quickly and rarely experiences errors
P9	The SIM-IPL application is useful for administrators and residents
P10	I am satisfied and willing to continue using the SIM-IPL application

Table 4. User Acceptance Test Assessment Aspects

Assessment Aspect	Question Codes	Number of Items
Ease Of Use	P1, P2, P3, P4, P5	5
Information Transparency	P6, P7, P8	3
User Satisfaction	P9, P10	2

The questionnaire data processing results indicate that SIM-IPL achieved excellent average scores across all assessment aspects. The ease-of-use aspect obtained an average score of 4.86 (97.2%), information transparency scored 4.90 (98.0%), and user satisfaction scored 4.88 (97.5%). The overall UAT average score was 4.88 (97.6%), which falls into the excellent category, as presented in Table 5.

Table 5. User Acceptance Test Recapitulation Results

Assessment Aspect	Average Score	%	Category
Ease Of Use	4.86	97.2	Excellent
Information Transparency	4.90	98.0	Excellent
User Satisfaction	4.88	97.5	Excellent
Overall Average	4.88	97.6	Excellent

Based on the questionnaire data analysis, the average scores for each assessment aspect were classified into evaluation categories. The recapitulation results show that the ease-of-use aspect achieved an average score of 4.86 (97.2%), categorized as excellent. The information transparency aspect obtained the highest average score of 4.90 (98.0%), also categorized as excellent, while the user satisfaction aspect achieved an average score of 4.88 (97.5%), categorized as excellent. The overall UAT average score of 4.88 (97.6%) indicates a very high level of user acceptance.

User Acceptance Test (UAT) is used to measure the level of user acceptance of the developed system based on direct usage experience. The test results demonstrate that SIM-IPL achieved an overall average score of 4.88 (97.6%), which falls into the excellent category. This indicates that the system has successfully met user needs optimally. The ease-of-use aspect, with an average score of 4.86, indicates that the system is easy to understand and operate. Clear menu navigation and simple core feature usage assist users in managing environmental fees efficiently. The information transparency aspect achieved the highest score of 4.90, indicating that the system is capable of presenting financial information clearly, accurately, and accessibly. Meanwhile, the user satisfaction aspect achieved an average score of

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4.88, indicating that users are satisfied with the system's overall benefits and performance.

These findings are consistent with previous studies stating that information systems developed in accordance with user needs tend to achieve high levels of user acceptance (Andriani, 2023; Fajaria & Tania, 2023). Based on these results, it can be concluded that SIM-IPL meets user requirements and is feasible to be implemented in supporting environmental fee management at Sunderland Jambi Housing Estate. The implementation of this system is considered to provide improvements compared to the previously used manual system, particularly in terms of ease of access and information transparency (Aziz & Prayoga, 2025).

DISCUSSION

The results of functional testing using the Black Box Testing method indicate that all main features of SIM-IPL operate in accordance with system requirements. The successful completion of this testing confirms that the system is capable of supporting computerized environmental fee management processes, ranging from transaction recording to financial report generation. Therefore, SIM-IPL is considered feasible for operational use in managing environmental fees at Sunderland Jambi Housing Estate.

The evaluation of user acceptance through the User Acceptance Test (UAT) shows a very high level of acceptance. The overall average score of 4.88 or 97.6% indicates that the system has optimally met user needs. In terms of ease of use, the average score of 4.86 demonstrates that the system is easy to understand and operate. Clear menu navigation and simple feature workflows enable users to efficiently perform environmental fee management activities.

The information transparency aspect achieved the highest score, with an average value of 4.90. This result indicates that SIM-IPL is capable of presenting financial information in a clear, accurate, and easily accessible manner. Transparent information availability has a positive impact on user trust in environmental fee management. Meanwhile, the user satisfaction aspect obtained an average score of 4.88, indicating that users are satisfied with the overall benefits and performance of the system.

These findings are consistent with previous studies which state that information systems developed in accordance with user needs tend to achieve high levels of user acceptance (Andriani, 2020) dan (Feishal Azriel Arya Putra et al., 2025). Furthermore, the implementation of SIM-IPL is considered to improve transparency and ease of access to information compared to manual systems, as reported by (Aziz & Prayoga, 2025). Thus, SIM-IPL functions not only as a transaction recording tool but also as a supporting medium for transparency and accountability in environmental fee management.

This study has several limitations, including the relatively small number of respondents and the involvement of only one research object, namely Sunderland Jambi Housing Estate. In addition, system evaluation focused solely on user perceptions using the User Acceptance Test (UAT) method without incorporating other evaluation models for comparison. Therefore, the results of this study cannot be generalized broadly and may be further developed in future research.

CONCLUSION

Based on the results and discussion, it can be concluded that the Environmental Fee Management Information System (SIM-IPL) has been successfully implemented as a computerized and integrated system for managing environmental fees at Sunderland Jambi Housing Estate. The system effectively supports the recording of income and expenditure transactions, user data management, and the presentation of financial reports in a more effective and transparent manner compared to the previously used manual system.

Functional testing using the Black Box Testing method demonstrates that all main features of SIM-IPL operate in accordance with the designed functional requirements and system specifications. In addition, the evaluation using the User Acceptance Test shows a very high level of user acceptance, with an average score of 4.88 or 97.6%. These results indicate that the system is easy to use, capable of presenting financial information transparently, and provides a high level of user satisfaction.

Overall, the implementation of SIM-IPL has proven to enhance the effectiveness of environmental fee management, improve financial information transparency, and support the performance of administrators as well as the convenience of residents in accessing environmental fee information. Therefore, SIM-IPL is considered feasible to be used and implemented as a supporting system for environmental fee management at Sunderland Jambi Housing Estate.

As recommendations for future development, SIM-IPL may be enhanced by adding an online payment feature to facilitate residents in conducting fee payment transactions. In addition, the development of a mobile-based platform may be considered to improve accessibility and user convenience. Regular system maintenance and development are also necessary to ensure data security, enhance system performance, and adapt the system to future user needs.

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