

Web-Based Information System for Transparency in Campus Facility Management

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ABSTRACT

The management of campus facilities plays an important role in supporting academic and non-academic activities in higher education institutions. However, facility management processes are often conducted separately and are not fully integrated, resulting in delays in data processing, limited transparency, and difficulties in generating usage reports. This study aims to design and implement a web-based information system to improve transparency and efficiency in campus facility management. The system was developed using the waterfall method, which consists of requirement analysis, system design, implementation, testing, and maintenance stage. Data collection was carried out through interviews, observation, and document analysis related to facility management processes. The resulting system is capable of managing facility data, borrowing and returning processes, maintenance records, reporting features, and master data with role-based access control for administrators. Functional testing was conducted using black-box testing to ensure that all system features operate according to predefined requirements. The results show that the system functions properly and support more structured, transparent, and well-documented facility management processes. The implementation of this system is expected to enhance efficiency, reduce miscommunication, and support decision-making in campus facility management

Keywords: Information System; Campus Facilities; Transparency; Web-Based System; Waterfall Method.

INTRODUCTION

Campus facilities and infrastructure are essential components in supporting the continuity of academic and non-academic activities within higher education institutions. Proper management of these facilities is required to ensure their availability, usability, and accountability in daily operations. Facilities such as classrooms, meeting rooms, and supporting equipment must be managed in an organized manner to avoid scheduling conflicts, misuse, or data inconsistencies.

In practice, facility management processes are often conducted using non-integrated systems or manual documentation. Data related to facility usage, borrowing schedules, and maintenance activities are frequently recorded separately, which may result in data redundancy, delays in reporting, and limited monitoring capabilities. These conditions can lead to miscommunication between administrators and reduce the effectiveness of facility utilization.

To address these issues, the development of an integrated information system is necessary to manage facility borrowing, returning, maintenance records, and reporting in a transparent and structured manner. A web-based system provides flexibility in access and enables centralized data management, allowing administrators to manage and monitor facility usage more efficiently.

This study focuses on the development of a web-based information system for transparency in campus facility management, specifically designed for internal administrators. The system aims to support the management of facility data, borrowing and returning processes, maintenance documentation, and report generation. Through the implementation of this system, it is expected that efficiency, data accuracy, and transparency in managing campus facilities can be improved.

METHOD

This study employed a Research and Development (R&D) approach focusing on the development of an information system to support transparency in campus facility management. The research was conducted through systematic stages to ensure that the developed system met the defined requirements and functioned properly within the intended scope.

Data Collection

Data collection was carried out to understand existing facility management processes and identify system requirements. The techniques used in this study included interviews, observation, and document analysis. Interviews were conducted with parties involved in campus facility management to obtain information regarding current workflows, problems encountered, and expected system features. Observation was performed to examine the actual process of managing facility borrowing, returning, and documentation in daily operations. In addition, document analysis was conducted to review records related to facility usage, maintenance activities, and reporting procedures.

System Development Method

The system was developed using the waterfall method, which consists of sequential stages including requirement analysis, system design, implementation, testing, and maintenance. In the requirement analysis stage, functional requirements and system boundaries were identified based on the collected data. The system design stage involved designing the system architecture, database structure, and user roles to support facility management activities. The implementation stage focused on translating the system design into a web-based application using PHP with the CodeIgniter 4 framework and MySQL as the database. The maintenance stage was intended to support system stability and allow future improvements as needed.

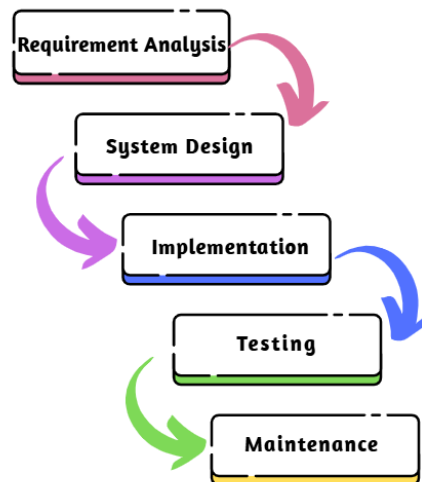


Figure 1. Stages of the Waterfall Method

System Testing

System testing was conducted using the black-box testing method. This testing approach focused on validating system functionality based on input and output behavior without examining internal code structure. The testing process aimed to ensure that each system function operated according to predefined requirements. Functional testing covered key modules such as facility data management, borrowing and returning processes, maintenance records, and report generation. The results of the testing indicated that all tested functions performed as expected and supported the intended system operations.

RESULT AND DISCUSSION

This section presents the results of system development and discusses the implementation of the web-based information system for transparency in campus facility management based on the developed system features.

Result

The result of this study is a web-based information system designed to support transparency in campus facility management. The system is intended for internal use and provides role-based access for

administrators, namely Admin Sarpras and Admin Master, with different access right according to their responsibilities.

The system was designed to manage facility data, borrowing and returning processes, maintenance records, and reporting features in an integrated manner.



Figure 2. System Design Diagram

Figure 2 shows the system design that describes user roles and the interaction between users and the system in managing campus facilities.

The implementation of the system provides an interface that supports operational activities related to facility management.

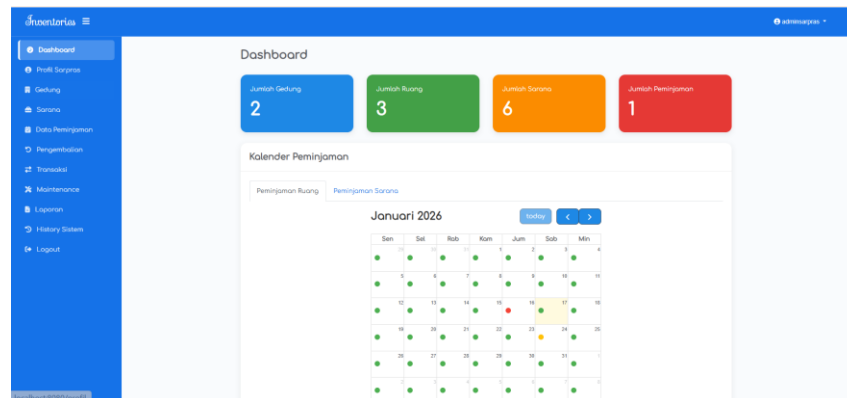


Figure 3. Admin Sarpras Dashboard Interface

Figure 3 presents the dashboard interface used by Admin Sarpras to monitor facility availability, borrowing status, and summary information. The core functionality of the system lies in the management of facility borrowing and documentation.

No	Nama	Instansi	Tanggal	Status	Aksi
1	dozai	organisasi rahasia	2026-01-24	Pending	Detail, Surat, Terima, Tolak
2	Chuuya	HMP	2026-01-23	Ditolak	Detail, Alasan Penolakan
3	dozai	organisasi rahasia	2026-01-16	Diterima	Detail, Surat, Pengembalian
4	dozai	organisasi rahasia	2025-12-17	Dembalkan	Detail, Surat
5	Chuuya	organisasi rahasia	2025-12-17	Dembalkan	Detail, Surat
6	dozai	organisasi rahasia	2025-12-16	Dembalkan	Detail, Surat

Figure 4. Facility Borrowing Management Page

Figure 4 shows the facility borrowing management interface, where administrators process borrowing data and manage facility availability.

No	Nama Sarana	Tipe	Tahun Beli	Gudang	Jumlah	Status	Aksi
1	kursi	ght78	2020	Warehouse A	80	Aktif	Edit, Hapus
2	sound system	cc21	2020	Warehouse A	4	Aktif	Edit, Hapus
3	Proyektor	zzz213	2022	Warehouse A	20	Aktif	Edit, Hapus
4	karpet	fdgget54	2019	Warehouse A	12	Aktif	Edit, Hapus
5	Meja Kayu Besar	Meja Ukir Jepara	2025	Warehouse A	10	Aktif	Edit, Hapus
6	Sofa Raja Namrud	ukiran asli jepara	2025	Warehouse A	12	Aktif	Edit, Hapus

Figure 5. Facility Data management Page

Figure 5 shows the facility data management interface used to manage facilities that are available for borrowing by the administrator.

No	Nama Gedung	Penanggung Jawab	Lokasi	Jumlah Ruang	Aksi
1	Gedung A	pak A	belakang gedung lobby	2 ruang	Lihat, Edit, Hapus
2	Gedung D	Pak D	pajak paling belakang	1 ruang	Lihat, Edit, Hapus

Figure 6. Building and Room Management Page

Figure 6 illustrates the building management interface that displays building data along with the associated rooms and facility information.

No	Nama	Instansi	Tanggal	Waktu	Prasarana	Sarana
1	dozai	organisasi rahasia	2026-01-24	17:17:00 - 10:17:00	Ruang D1	kursi (50)
2	Chuuya	HMP	2026-01-23	12:16:00 - 18:16:00	Ruang A2	sound system (1)
3	dozai	organisasi rahasia	2026-01-16	07:59:00 - 13:59:00	Ruang A2	kursi (20)
4	dozai	organisasi rahasia	2025-12-25	13:57:00 - 18:57:00	Ruang D1	-
5	Chuuya	organisasi rahasia	2025-12-25	17:58:00 - 04:58:00	Ruang D1	-
6	dozai	organisasi rahasia	2025-12-24	05:03:00 - 10:03:00	Ruang A2	-

Figure 7. Facility Usage Report Page

Figure 7 presents the reporting interface that allows administrators to view and print facility usage reports for documentation and monitoring purpose.

Functional testing using the balck-box testing method shows that the system functions operate according to the defined requirements, including data input, processing, and output.

Discussion

The results of system implementation indicate that the developed web-based information system is able to address several issues found in previous campus facility management practice. Prior to the implementation of this system, facility management relied on manual documentation and non-integrated processes, wich often led to data inconsistency, delays in reporting, and difficulties in monitoring facility usage.

The integration between facility data management, borrowing, returning, and maintenance modules enables the system to manage facility information in a structured annd centralized manner. Automatic updates to facility availability during borrowing and returning processes reduce the risk of human error and improve data accuracy. This integration also supports better coordination among administrators in managing campus facilities.

In addition, the availability of reporting features allows administrators ro generate facility usage reports efficiently. These reports support monitoring activities and provide documented information that can be used for evaluation and decision-making. Compared to the previous approach, the system improves transparency by ensuring that facility usage data is recorded, updated, and accessed in a consistent manner.

Overall, the implementation of this system demonstrates its potential to improve efficiency, accountability, and transparency in campus facility management. Although the system is currently designed for internal administrative use, it provides a solid foundation for further development according to institutional needs.

CONCLUSIONS

Based on the results of system development, implementation, and testing, this study concludes that the proposed web-based information system is capable of supporting transparency in campus facility management. The system successfully integrates facility data management, borrowing and returning processes, maintenance records, and reporting features within a single platform.

Functional testing using the black-box testing method confirms that all core system functionalities operate according to the defined requirements. The system is able to process data input, perform automatic updates, and generate output in the form of reports and documentation. These capabilities contribute to more efficient and structured facility management processes.

The implementation of this system reduces reliance on manual documentation and non-integrated processes, thereby improving data accuracy and administrative efficiency. As a result, the system can support better monitoring and documentation of campus facility usage. Future enhancements may focus on expanding system features and scalability to further optimize campus facility management.

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