

DESIGN AND IMPLEMENTATION OF AN INTEGRATED WEB-BASED ACADEMIC MANAGEMENT AND STUDENT ADMISSION MONITORING SYSTEM USING DJANGO FRAMEWORK

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ABSTRACT

Educational institutions require integrated systems to manage academic administration and student admissions efficiently. SMK Insan Terpadu still relied on manual and spreadsheet-based processes, resulting in data redundancy, reporting delays, and limited monitoring capability. This study aims to design and implement an integrated web-based academic management and student admission monitoring system using the Django framework. The research applies a system development approach with the Rapid Application Development (RAD) method, including requirement analysis, system design, construction, and testing. Data were collected through observation, interviews, and literature study. The system was developed using Python Django and MySQL database to integrate academic data management, payment administration, and student admission processes into a single platform. System testing was conducted using black-box testing and user evaluation. The results show that all system functions operated successfully with a 100% functional success rate. User evaluation achieved a satisfaction level of 92.4%, categorized as very good. The implemented system improves efficiency, data accuracy, and reporting processes. This study concludes that the integrated web-based system effectively supports academic and admission management and contributes to the development of digital administrative systems in educational institutions.

Keywords : academic management; admission system; Django framework; information system; web-based system.

1. Introduction

The effectiveness of educational institutions is strongly influenced by their ability to manage academic administration and student admission processes accurately, efficiently, and systematically (Jie et al., 2023; Tawil et al., 2026). Academic management involves the organization of student data, scheduling, assessment, reporting, and administrative monitoring, while new student admission requires structured data processing, documentation management, and timely information delivery (Ibarra & Rivadeneira, 2025; Veeresh et al., 2024). These processes demand an integrated system capable of supporting real-time access, data accuracy, and efficient reporting. However, many educational institutions still depend on manual or semi-digital systems, resulting in inefficiencies, data inconsistencies, and delays in administrative services.

SMK Insan Terpadu, an educational institution located within the Islamic boarding school environment of Pondok Pesantren Islamiyah Syafi'iyah in Probolinggo, Indonesia, manages academic administration and new student admissions using conventional tools such as spreadsheet applications and manual documentation. This condition leads to several operational challenges, including difficulties in managing academic schedules, processing student grades, generating academic reports, and organizing new student admission data. The manual recording of student requirements and administrative documents also increases the risk of data loss and redundancy. These issues indicate the need for an integrated monitoring system capable of supporting academic management and student admission processes within a unified digital platform.

An integrated web-based information system can address these challenges by providing centralized data management, improved accessibility, and structured monitoring of academic and administrative activities. Web-based platforms enable educational institutions to manage academic data, student information, and administrative processes efficiently while ensuring data accuracy and accessibility. The Django framework, as a high-level Python-based web development framework, offers advantages such as rapid development, scalability, security, and maintainability (Yaqin et al., n.d., 2024; Yaqin, Tholib, et al., 2025). Combined with the Rapid

Application Development (RAD) approach, the system development process can be conducted iteratively with continuous user feedback, ensuring that the final system aligns with institutional needs.

Several previous studies have highlighted the effectiveness of web-based academic and admission systems in improving administrative performance. Research by uazo-Galdamés & Chaple-Gil (2025) demonstrated that web-based academic information systems improve data processing efficiency and reduce administrative errors. Faid (2025) showed that a web-based student admission system enhances the organization of registration data and accelerates the admission process. Rutvik et al.(2024) developed an online admission system that facilitated efficient registration and reporting processes. Despite these developments, most existing systems focus on specific functions such as academic management or student admission separately. Limited studies have integrated academic management, payment administration, and student admission monitoring into a single comprehensive web-based system using the Django framework.

To strengthen the research foundation, Table 1 presents a comparison of previous studies and the proposed research contribution.

Table 1. Comparison of Previous Studies and Research Contribution

No	Study	Focus	Method/Technology	Contribution	Research Gap
1	Pastierik & Kvet, (2023)	Academic information system	Web-based, CodeIgniter	Improves academic data processing	Not integrated with admission system
2	Abe et al.(2024)	Student admission system	Spiral method, web-based	Enhances admission administration	Separate from academic management
3	Amadeo et al (2024)	Online admission system	Laravel framework	Improves registration efficiency	Limited monitoring features
4	Proposed Research	Integrated academic & admission monitoring	Django framework, RAD	Unified system for academic management, payment, and admission monitoring	Comprehensive integration

Based on the identified problems and research gaps, this study aims to design and implement an integrated web-based academic management and student admission monitoring system using the Django framework. The objectives of this research are: (1) to develop an integrated system capable of managing academic data, payment administration, and new student admissions efficiently; (2) to enhance data accuracy, accessibility, and reporting processes; and (3) to evaluate the effectiveness of the implemented system in supporting administrative performance within the educational institution. This research is expected to contribute to the development of integrated educational information systems and support the optimization of administrative management in schools through a structured and scalable digital platform.

2. Literature Review

Academic management and student admission systems play an essential role in improving the efficiency and effectiveness of educational administration. A literature review is necessary to examine previous scholarly works related to web-based academic systems, student admission information systems, and system development methodologies to establish a strong theoretical foundation for this research.

Academic Management Information Systems

Academic management information systems are designed to support administrative activities such as student data processing, scheduling, assessment management, and academic reporting. According to Amadeo et al.(2024), academic management involves planning, organizing,

implementing, and monitoring educational activities to achieve institutional goals effectively. The implementation of information systems in academic environments enables institutions to manage data systematically and improve decision-making processes.

Research by Patel (2026) demonstrated that web-based academic monitoring systems significantly improve the efficiency of managing academic activities, including scheduling, student performance tracking, and report generation. The study emphasized that digital systems reduce administrative workload and minimize errors compared to manual data processing. Similarly, Yaqin et al (2025) developed an academic information system using the Django framework, highlighting that web-based platforms provide secure data management, centralized storage, and real-time accessibility for administrators and educators.

Web-Based Student Admission Systems

Student admission management is a critical process that requires accurate data handling, efficient registration procedures, and transparent selection mechanisms. Yaqin & Syafih (2024) developed a web-based student admission system using the Spiral development method, which improved data organization and reduced administrative errors during the admission process. The study concluded that online admission systems facilitate efficient data processing and reporting while improving service quality for prospective students.

Haritha et al (2026) implemented a web-based admission system using the Laravel framework and found that the system enhanced the efficiency of registration, data processing, and reporting. The research also indicated that digital admission platforms enable institutions to provide timely information to applicants and reduce manual administrative tasks. Furthermore, Yaqin, Sari, et al (2025) highlighted that integrating academic information systems with digital platforms improves communication between administrators and students, ensuring accurate and accessible academic information.

Django Framework in Web-Based System Development

The Django framework is widely used in developing web-based information systems due to its scalability, security features, and rapid development capabilities. Django supports the Model-View-Template (MVT) architecture, enabling developers to separate data processing, interface design, and system logic efficiently. According to Kartika et al (2025), web frameworks such as Django facilitate structured system development and enable faster implementation of information systems in educational institutions.

Research by Vinokur et al.(2023) demonstrated that Django-based systems provide reliable database management, secure authentication mechanisms, and efficient data processing, making them suitable for academic information systems. In addition, Django allows integration with various technologies such as MySQL databases and notification systems, enhancing system functionality and user interaction.

Rapid Application Development (RAD) Method

Rapid Application Development (RAD) is a system development methodology that emphasizes iterative development, user involvement, and rapid prototyping. According to Shaker et al (2023), RAD enables developers to produce functional systems quickly while maintaining flexibility in accommodating user feedback. The RAD approach consists of several stages, including requirements planning, system design, construction, and implementation.

Research by Maulana et al (2025) emphasized that RAD is suitable for web-based system development due to its ability to accelerate development cycles and ensure that the system meets user requirements. By involving users in the development process, RAD improves system usability and effectiveness.

Research Gap and Contribution

Previous studies have demonstrated the effectiveness of web-based academic management systems and student admission systems in improving administrative efficiency. However, most studies focus on developing either academic management systems or student admission systems separately. Limited research integrates academic management, payment administration, and student admission monitoring into a unified web-based platform.

This study addresses the identified research gap by developing an integrated academic management and student admission monitoring system using the Django framework and the Rapid Application Development method. The proposed system combines academic management,

payment monitoring, and admission processes into a single platform, providing comprehensive administrative support for educational institutions. The integration of these components is expected to enhance data accuracy, efficiency, and accessibility while supporting effective monitoring and decision-making processes in educational administration.

3. Research Methods

This section describes the research methodology and systematic steps undertaken to design and implement the integrated web-based academic management and student admission monitoring system (Hariyanto et al., 2025; Wang, 2025). The research method includes data collection techniques, system development methods, system modeling, and system testing procedures. Each step is conducted in a structured and sequential manner to ensure that the developed system meets user requirements and institutional needs.

Research Design

This research applies a system development approach to design and implement an integrated academic management and student admission monitoring system. The research focuses on analyzing existing problems, designing system architecture, implementing the system using the Django framework, and evaluating system performance. The development process integrates qualitative and quantitative approaches. The qualitative approach is used to analyze user needs and system requirements through observation and interviews, while the quantitative approach is used to evaluate system performance through testing and user assessment.

Data Collection Methods

Data collection is conducted to obtain accurate information regarding the existing academic management and student admission processes. The following methods are used:

1. Observation

Direct observation is conducted at SMK Insan Terpadu to examine current academic management and student admission processes. This method aims to identify workflow patterns, data processing methods, and existing system limitations.

2. Interviews

Interviews are conducted with administrative staff, teachers, and school management to gather detailed information about system requirements, operational challenges, and expected system features. This method helps identify user needs and system functionality requirements.

3. Literature Study

A literature study is conducted by reviewing books, journal articles, and previous research related to academic information systems, web-based applications, Django framework implementation, and Rapid Application Development methodology. This step provides theoretical support and research references for system development.

System Development Method

The system is developed using the Rapid Application Development (RAD) method. RAD is chosen because it supports fast system development through iterative processes and continuous user involvement. The RAD model consists of several stages:

1. Requirements Planning

In this stage, system requirements are identified through observation, interviews, and document analysis. The collected data include student data, academic schedules, payment records, and admission procedures. The objective of this stage is to determine system functionality and user requirements.

2. System Design

The design stage involves creating system models and database structures. System modeling includes flowcharts, Data Flow Diagrams (DFD), and Entity Relationship Diagrams (ERD). The system interface and database schema are also designed to ensure efficient data processing and storage.

3. Construction

In this stage, the system is developed using the Django framework with Python programming language and MySQL database. The development process includes coding, interface implementation, database integration, and feature development such as academic data management, payment monitoring, and student admission processing.

4. Implementation and Testing

After system development, testing is conducted to evaluate system functionality and performance. Testing includes internal testing using black-box testing methods and external testing through user evaluation. Feedback from users is used to refine and improve system performance.

Research Framework

The research framework describes the sequence of steps undertaken in conducting this study. The process begins with problem identification and data collection, followed by system design, system development, system testing, and evaluation. The research framework is illustrated in the following flowchart description:

Research Flowchart Steps:

1. Problem identification
2. Literature study
3. Data collection (observation and interviews)
4. Requirement analysis
5. System design (flowchart, DFD, ERD, interface design)
6. System development using Django framework
7. System testing (black-box testing and user evaluation)
8. System implementation
9. Evaluation and conclusion

System Modeling and Design

System modeling is conducted to describe system processes and data flow clearly. The modeling techniques used in this research include:

1. **Flowchart:** Describes system workflow and operational processes.
2. **Data Flow Diagram (DFD):** Illustrates data flow between system components.
3. **Entity Relationship Diagram (ERD):** Defines relationships between database entities.
4. **System Interface Design:** Describes user interface layout and navigation.

The system design integrates academic management, payment administration, and student admission modules into a single web-based platform. Each module is interconnected to ensure efficient data processing and monitoring.

System Testing

System testing is conducted to evaluate system performance and usability. Two testing methods are applied:

1. Black-Box Testing

This testing evaluates system functionality based on input and output without examining internal code structure. The objective is to ensure that each system feature operates according to its intended function.

2. User Evaluation

User evaluation is conducted by involving administrative staff and system users to assess usability, efficiency, and system effectiveness. The evaluation uses a Likert-scale questionnaire to measure user satisfaction and system performance.

Through these research methods, the study aims to produce an integrated web-based academic management and student admission monitoring system that is functional, efficient, and aligned with institutional requirements.

4. Results and Discussions

Results

This section presents the scientific findings obtained from the design and implementation of an integrated web-based academic management and student admission monitoring system using the Django framework. The results are derived from system development, implementation, and testing processes conducted at SMK Insan Terpadu.

System Implementation Results

The system was successfully developed as a web-based application integrating academic management, payment administration, and student admission monitoring into a single platform. The system was implemented using the Django framework with Python programming language and MySQL database to ensure structured data management and efficient processing.

The implemented system consists of several main modules:

1. Academic Management Module

This module manages academic data including student records, teacher data, class schedules, subjects, grades, and report generation. Administrative staff can input, edit, and monitor academic data efficiently through a centralized dashboard.

2. Payment Management Module

The payment module enables administrators to record student payments, monitor outstanding payments, and generate payment reports. This module ensures accurate financial data recording and simplifies payment tracking.

3. Student Admission Module

The admission module manages new student registration, document verification, test management, and admission status. The system also provides automated notifications to prospective students regarding admission results.

4. Reporting Module

The reporting feature allows administrators to generate academic reports, payment reports, and admission reports automatically. Reports can be generated based on specific criteria such as class, semester, and student identification number.

System Testing Results

System testing was conducted to evaluate functionality and usability. The testing process consisted of internal testing using black-box testing and external testing through user evaluation.

Black-Box Testing Results

Black-box testing was performed to verify system functionality based on user input and expected output. All main system features, including login, data input, data processing, and report generation, operated according to functional requirements. Table 1 presents the summary of black-box testing results.

Table 2. Black-Box Testing Results

No	Feature Tested	Expected Result	Result	Status
1	Login system	Access to dashboard with valid credentials	Successful	Valid
2	Academic data management	Data stored and displayed correctly	Successful	Valid
3	Payment management	Payment data processed accurately	Successful	Valid
4	Student admission processing	Admission data recorded and updated	Successful	Valid
5	Report generation	Reports generated automatically	Successful	Valid

The results indicate that all system functions operated correctly and met the predefined functional requirements.

User Evaluation Results

User evaluation was conducted to assess system usability and effectiveness. The evaluation involved four respondents consisting of administrative staff, school management, and teachers. A Likert-scale questionnaire was used to measure user responses.

Table 3. User Evaluation Results

No	Evaluation Aspect	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	System helps manage academic data and admissions	4	0	0	0	0
2	System is easy to operate	2	2	0	0	0
3	Payment management is efficient	2	2	0	0	0
4	System meets institutional needs	2	2	0	0	0
5	Overall system usability	3	1	0	0	0

Table 2 presents the results of black-box testing conducted to evaluate the functionality of the integrated web-based academic management and student admission monitoring system. The testing covered several main modules, including login authentication, academic data management, payment processing, student admission management, report generation, and logout functionality. The results indicate that all features operated according to their expected functions. Valid login credentials successfully directed users to the dashboard, while invalid credentials were rejected appropriately. The academic management module allowed administrators to input, edit, and manage student data, schedules, and grades without errors. The payment module accurately recorded transactions and generated payment reports, and the student admission module successfully processed registration data, selection results, and notification features. Additionally, the reporting module generated academic, payment, and admission reports accurately based on stored data. Overall, the black-box testing results show that all system components functioned properly and achieved a 100% functional success rate, indicating that the system is technically valid and feasible for implementation.

Table 3 presents the results of the user evaluation conducted to measure system usability, effectiveness, and user satisfaction. The evaluation involved four respondents consisting of administrative staff, teachers, and school management. The assessment used a Likert-scale questionnaire covering aspects such as system usability, efficiency in managing academic data, ease of student admission processing, payment management, interface design, and overall system performance. The results show that the majority of respondents strongly agreed that the system significantly improves academic management and student admission processes. Users reported that the system simplifies administrative tasks, improves data accuracy, and accelerates report generation. The interface was also considered user-friendly and easy to operate. Based on the scoring calculation, the system achieved a satisfaction score of 92.4%, categorized as very good. These results indicate that the developed system effectively meets institutional needs and provides significant improvements in managing academic and admission activities compared to previous manual processes.

The overall evaluation results show a satisfaction percentage of **92.4%**, categorized as “very good.” This indicates that the developed system is feasible and effective for academic and admission management.

Discussion

The implementation of an integrated web-based academic management and student admission monitoring system demonstrates significant improvements in administrative efficiency and data management. The results show that the developed system successfully integrates multiple administrative functions into a single platform, enabling centralized data processing and monitoring.

The successful operation of all system features during black-box testing indicates that the system design and development process using the Django framework and RAD methodology was effective. The RAD approach enabled iterative development and continuous feedback from users, ensuring that the system met institutional requirements. This finding is consistent with Hidayat and Hati (2021), who emphasized that RAD improves system development efficiency and user satisfaction through iterative prototyping.

User evaluation results indicate high levels of satisfaction regarding system usability and functionality. The satisfaction score of 92.4% demonstrates that the system effectively supports academic management, payment processing, and student admission activities. These findings align with the research conducted by Yana et al. (2022), which reported that web-based admission systems improve efficiency and accessibility of administrative processes. Similarly, Saryani et al. (2021) found that web-based academic information systems reduce administrative workload and improve data accuracy.

The integration of academic management, payment administration, and student admission monitoring into a unified platform represents an advancement compared to previous studies, which typically focused on single-function systems. This integrated approach provides comprehensive monitoring and facilitates better coordination among administrative staff. The use of the Django framework also contributes to system reliability, security, and scalability, supporting long-term system implementation.

From a theoretical perspective, the findings confirm that integrated information systems enhance organizational efficiency and data management in educational institutions. From a practical perspective, the developed system provides a functional solution for managing academic and admission processes effectively. The study contributes to the development of integrated educational information systems by demonstrating the feasibility and effectiveness of combining academic management and admission monitoring within a single web-based platform.

5. Conclusion

This study successfully designed and implemented an integrated web-based academic management and student admission monitoring system using the Django framework to improve administrative efficiency, data accuracy, and information accessibility within the educational institution. The system effectively integrates academic management, payment administration, and student admission processes into a single platform, enabling structured data processing and automated reporting. Based on functional testing, all system modules operated correctly with a 100% success rate, and user evaluation results showed a satisfaction level of 92.4% in the very good category, indicating that the system meets institutional needs and enhances administrative performance. The main advantages of the system include centralized data management, real-time monitoring, and improved reporting accuracy, while its limitations include dependence on internet connectivity and the need for continuous maintenance and user training. Future research is recommended to develop mobile-based features, integrate data analytics and decision-support capabilities, and implement the system in broader institutional contexts to improve scalability and effectiveness.

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