



Development of a Web-Based Student Admission System with Cloud Storage for Permanent Registration at Darel Azhar Modern Islamic Boarding School

Dwi Fitria Alfiani¹, Najwa Masayu Azzahra², Ariyas Pratama³, Sutriyono⁴

Program Studi Teknik Informatika, Fakultas Ilmu Komputer, Universitas Pamulang.
Jl. Raya Puspitek, Buaran, Kec. Pamulang, Kota Tangerang Selatan, Banten 15310

Article Info	ABSTRACT
Corresponding Author: Dwi Fitria Alfiani E-mail: weealfn28@gmail.com	Pondok Pesantren Modern Darel Azhar is currently facing a serious challenge in the form of an unstable registration platform, which frequently changes links every academic year owing to third-party dependencies. The primary impact of this condition is the permanent loss of applicant student (santri) data from previous periods due to the absence of an adequate internal storage system. This study aims to build an independent online student admission information system (PPDB Online) utilizing cloud storage infrastructure to ensure data sustainability and information access stability. The system was developed using the Laravel framework following the SDLC Waterfall model, which encompasses requirement analysis through observation, interviews, and literature reviews. The supporting infrastructure is entirely cloud-based, utilizing Vercel for hosting, TiDB Cloud as the centralized database, and Cloudinary for centralized digital document storage. System testing was conducted using Black-box Testing to ensure feature functionality, and User Acceptance Testing (UAT) to validate that the system meets user requirements and is ready for implementation. The implementation results indicate that this PPDB Online system successfully integrates data into a single centralized database. Consequently, the Islamic boarding school management can securely manage student information from various academic years without the risk of data loss caused by changing platforms. Thus, this system provides full independence for Pondok Pesantren Modern Darel Azhar in managing its information assets while enhancing administrative service professionalism in the digital era. Keywords: PPDB Online, Cloud Storage, Laravel, TiDB Cloud, Cloudinary, Centralized Database

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INTRODUCTION

The adoption of information technology has become increasingly widespread across various sectors, including education (Hamdi et al., 2025). In the digital era, educational institutions are required to implement efficient and reliable information systems to support academic activities, particularly the annual New Student Admission (PPDB) process (Mutam-mimul Ula et al., 2024). Global trends indicate that the digitalization of Islamic boarding schools (*pesantren*), especially in student admission systems, has become an effective solu-

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tion for improving transparency, operational efficiency, and information accessibility for prospective students and their parents (Sanjaya et al., 2025). The implementation of web-based information systems has modernized admission procedures by reducing administrative workloads and minimizing manual data entry errors (Mutammimul Ula et al., 2024). Through online registration systems, prospective students and parents can access admission information and complete the registration process in real time without geographical or time limitations.

Despite these technological advancements, Pondok Pesantren Modern Darel Azhar continues to face significant challenges in managing its student admission process. Although an online registration form has been adopted, the institution still depends entirely on third-party platforms to host the registration system. Consequently, the registration website link must be replaced every academic year, creating operational inefficiencies and disrupting the continuity of admission services. This dependency also introduces a substantial gap between the expected characteristics of a stable and centralized digital system and the actual implementation, where historical applicant data are frequently lost due to the absence of an internally managed backup mechanism (Hamdi et al., 2025). Furthermore, the management of applicants' physical documents remains susceptible to duplication and complicates real-time data verification (Sanjaya et al., 2025). The continued reliance on conventional or poorly integrated administrative procedures often results in delayed information processing and reduced operational efficiency.

To address these challenges, this study proposes the development of an independent web-based New Student Admission Information System using the Laravel framework integrated with cloud storage technology. A web-based system was selected because of its capability to improve operational efficiency, accessibility, and flexibility in managing admission data (Hamdi et al., 2025). The integration of cloud storage enables applicant data and supporting documents to be securely stored within a centralized database that can be accessed anytime while minimizing the risk of data loss caused by hardware failures or changes in third-party platforms (Hidayati et al., 2024). This approach supports the transition from temporary or manually managed registration systems to a more secure, structured, and sustainable digital information system (Aliffandi et al., 2025).

The primary objective of this study is to develop a web-based New Student Admission Information System that facilitates access to admission information and enables prospective students to complete the registration process without spatial or temporal constraints (Hidayati et al., 2024). Simultaneously, the proposed system is intended to assist the administrators of Pondok Pesantren Modern Darel Azhar in managing applicant data through a centralized, secure, and permanent database that enhances the accuracy, transparency, and professionalism of admission management. Previous studies have demonstrated that the utilization of information technology in Islamic boarding school management significantly improves data accountability and supports more effective online admission services (Nur Ahmad Mauludi et al., 2024). Therefore, this study focuses on the development of a web-based New Student Admission Information System integrated with cloud storage as a permanent registration platform for Pondok Pesantren Modern Darel Azhar. The proposed system is expected to provide a stable, integrated, and sustainable admission platform that eliminates dependence on third-party services while improving administrative efficiency, ensuring long-term data security, and facilitating information access for prospective students and parents. Furthermore, the findings of this study are expected to serve as a

reference for other educational institutions facing similar challenges in implementing sustainable digital admission systems and contribute to the advancement of professional, transparent, and technology-oriented educational services.

METHOD

This study employed a Research and Development (R&D) approach to design, develop, and evaluate a web-based New Student Admission Information System for Pondok Pesantren Modern Darel Azhar. The research focused on developing an integrated admission platform capable of overcoming the limitations of the existing registration process, particularly the dependence on third-party registration platforms, fragmented applicant databases, and the absence of permanent digital infrastructure. The development process was conducted directly within the operational environment of the institution to ensure that the resulting system met actual user requirements and organizational needs.

Data collection was carried out using three complementary techniques. First, direct observation was conducted to examine the existing admission workflow, identify operational problems, and understand the limitations of the current registration system. Second, semi-structured interviews were conducted with the PPDB committee and school administrators to gather functional requirements, identify administrative challenges, and determine the expected system features. Third, a literature review was performed by examining previous studies, books, and scientific publications related to information systems, web application development, cloud computing, and online admission systems to establish the theoretical foundation of the proposed solution.

The system was developed following the Software Development Life Cycle (SDLC) using the Waterfall model. This development model consists of sequential phases, including requirement analysis, system design, implementation, testing, and deployment. During the analysis phase, user requirements were identified through observations and interviews. The design phase employed Unified Modeling Language (UML), including flowcharts, use case diagrams, activity diagrams, sequence diagrams, and class diagrams to model the system architecture and business processes. The implementation phase translated the system design into a functional web application, while the testing phase verified system functionality before operational deployment.

The proposed application was developed using the Laravel framework based on the Model-View-Controller (MVC) architecture and PHP programming language. To ensure scalability and long-term data availability, TiDB Cloud was implemented as the centralized cloud-native relational database, while Cloudinary was integrated to manage digital document uploads such as family cards, birth certificates, academic certificates, and applicant photographs. The application was deployed on the Vercel cloud platform to provide a permanent registration website that eliminates the need to change registration links every academic year. This architecture enables centralized data management, secure cloud-based storage, and continuous accessibility for both administrators and prospective students.

The developed system was evaluated using two complementary testing approaches. Functional verification was conducted through Black Box Testing to ensure that each feature operated according to the specified functional requirements without examining the internal program code. The tested modules included user registration, authentication, applicant data management, document upload, payment verification, and administrative functions. Subsequently, User Acceptance Testing (UAT) was performed by involving the PPDB

committee as the primary end users to evaluate system usability, functionality, and operational suitability. The feedback obtained from users was used to determine whether the proposed system effectively supported the admission process and satisfied the operational requirements of Pondok Pesantren Modern Darel Azhar.

RESULTS AND DISCUSSION

System Analysis

The system analysis stage was conducted to examine the existing New Student Admission (PPDB) process at Pondok Pesantren Modern Darel Azhar and to identify the operational challenges that hindered effective admission management. The analysis focused on evaluating the current registration workflow, identifying system limitations, and determining the functional requirements for the proposed web-based information system. The findings from this stage served as the foundation for designing an integrated admission system capable of improving efficiency, data security, and long-term data management.

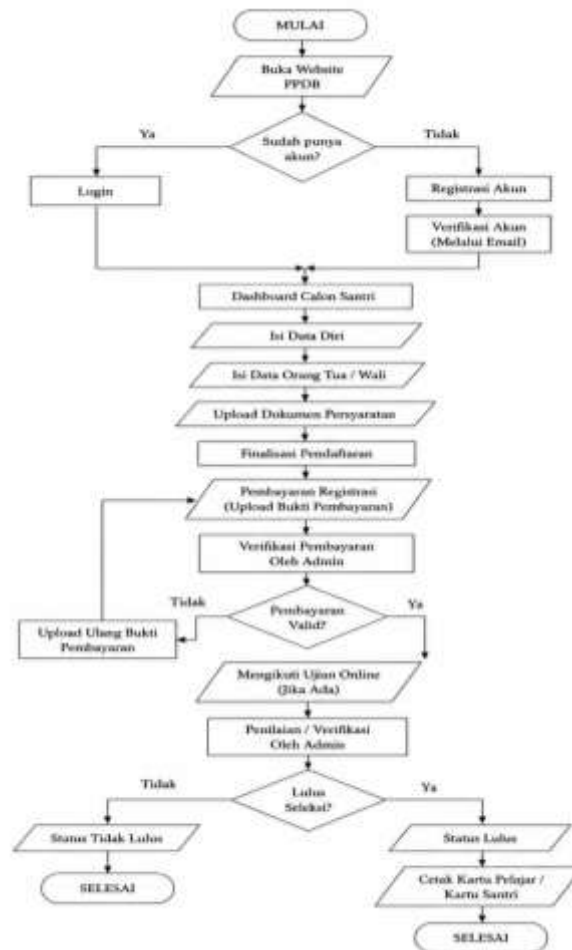


Figure 1. Flowchart

The admission process begins when prospective students access the permanent registration website and complete the online registration form by entering personal information and uploading the required supporting documents. The submitted data are validated and securely stored in the centralized cloud database, enabling administrators to verify applicant information through the administrative dashboard. Following the verification process, ad-

ministrators can manage applicant records, monitor registration progress, validate uploaded documents, and generate admission information through a single integrated platform.

Compared with the previous admission process, which relied on third-party registration platforms and fragmented data management, the proposed system provides significant improvements in operational efficiency and data reliability. The implementation of a permanent registration platform eliminates the need to create a new registration link each academic year, while centralized cloud storage ensures that applicant data remain securely preserved across multiple admission periods. Consequently, the proposed system reduces the risk of data loss, improves administrative efficiency, and supports a more transparent and sustainable admission process at Pondok Pesantren Modern Darel Azhar.

System Design

The system design stage was conducted to translate the identified user requirements into a structured application architecture that supports the online admission process at Pondok Pesantren Modern Darel Azhar. During this stage, Unified Modeling Language (UML) was employed to visualize the business processes, user interactions, and system behavior. The resulting design provides a clear blueprint for system implementation and ensures that all functional requirements identified during the analysis phase are adequately represented.



Figure 2. Use Case Diagram

Figure 2 presents the use case diagram of the proposed web-based New Student Admission (PPDB) Information System, illustrating the interactions between system users and the functional modules available within the application. The system involves three primary actors, namely Prospective Students, PPDB Administrators, and the Super Administrator, each having different responsibilities and access privileges according to their respective roles.

Prospective students interact with the system to complete the online admission process independently. Their activities include creating an account, logging into the system,

completing personal and family information, uploading the required supporting documents, submitting proof of registration payment, monitoring the admission status, and printing the student identification card after successfully passing the admission process. Meanwhile, PPDB administrators are responsible for managing the daily operational activities of the admission process, including verifying applicant documents, validating registration payments, monitoring applicant information, updating admission status, and communicating with applicants when necessary. In addition to performing all administrative functions, the Super Administrator has full managerial authority to configure admission settings, manage administrator accounts, and supervise the overall operation of the system.

The use case diagram demonstrates that the proposed system clearly separates user responsibilities while integrating all admission activities within a centralized web-based platform. This role-based access mechanism improves system security, simplifies administrative workflows, and ensures that each user can access only the functionalities relevant to their responsibilities. Consequently, the proposed system supports a more organized, transparent, and efficient admission process compared with the previous approach that relied on external registration platforms and fragmented data management.

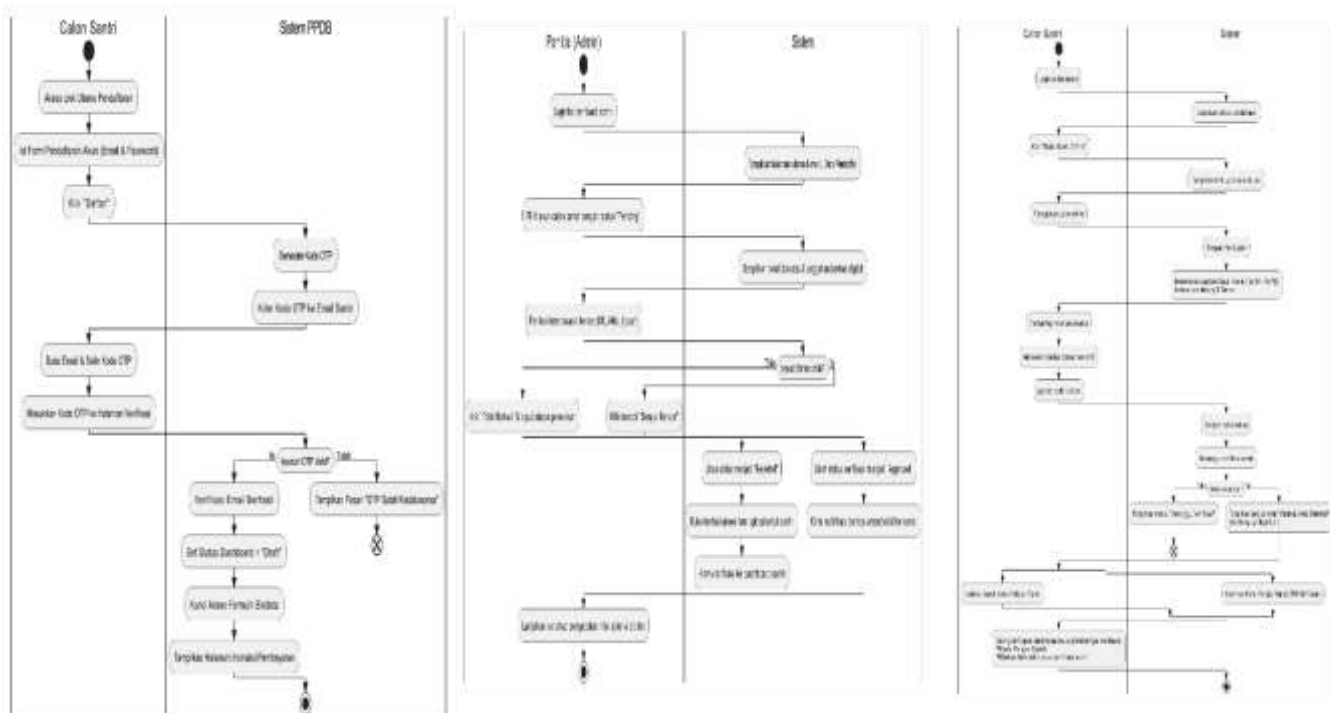


Figure 3. Activity Diagram

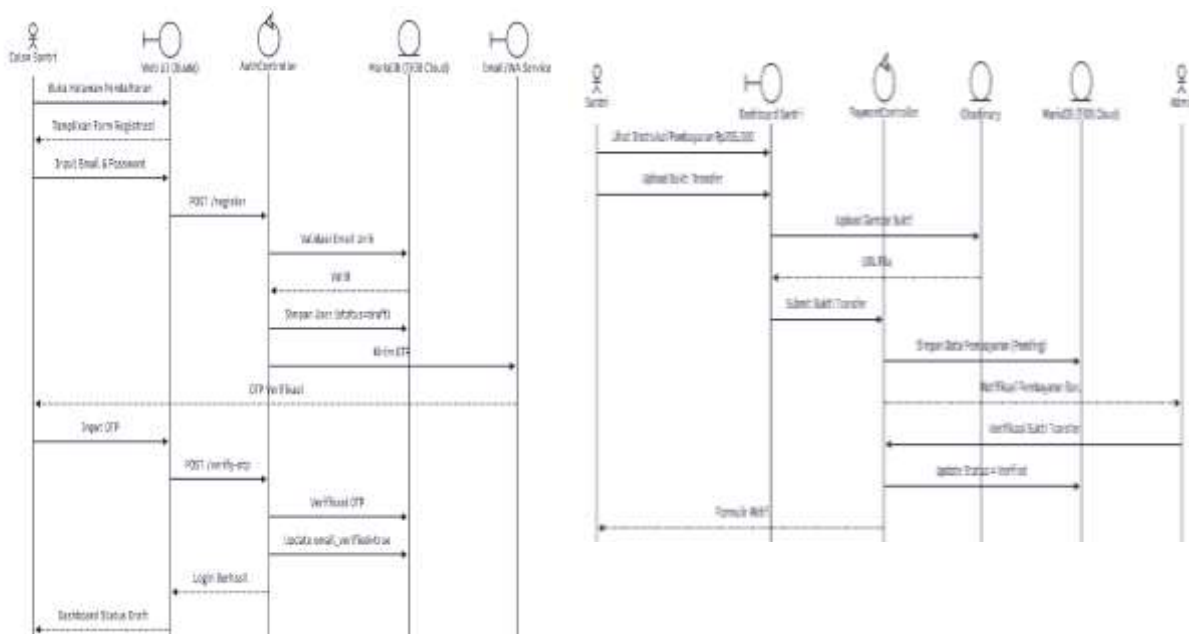
Figure 3 presents the activity diagram of the proposed PPDB information system. The workflow begins when prospective students access the online registration website and complete the registration form by entering personal information and uploading the required supporting documents. The system then validates the submitted information before storing it in the centralized cloud database. After successful registration, administrators access the administrative dashboard to verify applicant data, review uploaded documents, validate payment information, and determine the admission status. The process concludes with the generation of admission information that can be accessed through the system.

The activity diagram demonstrates that the proposed system integrates all admission activities into a single digital workflow, replacing the fragmented manual procedures previ-

ously used by the institution. By automating data validation, document submission, and applicant management, the system reduces administrative complexity, shortens processing time, and minimizes the risk of human error. Furthermore, the integration of cloud-based infrastructure ensures continuous data availability and supports sustainable management of applicant information across multiple admission periods. These findings are consistent with previous studies indicating that web-based admission systems improve operational efficiency, transparency, and service quality in educational institutions (Hamdi et al., 2025; Mutammimul Ula et al., 2024; Sanjaya et al., 2025).

Sequence Diagram

The sequence diagram was developed to illustrate the dynamic interactions among users, system components, and the database during the execution of the New Student Admission (PPDB) process. Unlike the use case diagram, which describes the functional requirements of the system, the sequence diagram focuses on the chronological flow of messages exchanged between objects to accomplish specific system operations. This modeling technique provides a detailed representation of the communication process and ensures that every system function is executed sequentially according to the defined business logic.





The admission process begins when a prospective student accesses the registration page and submits personal information together with the required supporting documents through the web interface. The application validates the submitted data before transmitting them to the cloud database for permanent storage. Once the registration process is successfully completed, the system provides confirmation to the applicant, while the submitted information becomes immediately available for administrative review. Subsequently, PPDB administrators authenticate themselves through the system, verify applicant information and uploaded documents, validate payment records, and update the admission status. All

The sequence diagram demonstrates that the proposed system enables seamless communication between users, application services, and cloud-based storage infrastructure. By automating data validation, document management, and transaction processing, the system minimizes manual intervention, reduces processing delays, and improves the reliability of admission services. Furthermore, the centralized interaction mechanism supports real-time information updates and secure data management, thereby contributing to a more efficient, transparent, and sustainable PPDB process at Pondok Pesantren Modern Darel Azhar.

The class diagram was developed to represent the static structure of the proposed web-based New Student Admission (PPDB) Information System. It describes the main classes, attributes, operations, and relationships required to support account registration, applicant data management, document submission, payment verification, admission assessment, and user administration. The diagram also serves as a structural reference for implementing the application database and object-oriented components.



The class diagram also includes payment and verification classes that record registration payments, uploaded proof of payment, validation status, and administrative decisions. These classes are connected to the applicant and administrator entities to ensure that each transaction can be traced to the relevant user and verification process. The relationships among classes are defined through primary and foreign keys, enabling TiDB Cloud to maintain referential integrity and centralized applicant records across admission periods.

The class structure demonstrates that the proposed system integrates admission data, digital documents, payments, verification processes, and user access within a unified architecture. This design reduces data duplication, supports role-based access control, and facilitates future system development. It also provides a reliable foundation for permanent, secure, and scalable management of PPDB data at Pondok Pesantren Modern Darel Azhar.

User Interface Implementation

The user interface implementation stage translated the previously developed interface designs into functional web pages that could be accessed by prospective students and PPDB administrators. The interface was designed to provide clear navigation, structured information, and responsive interaction across different devices. Particular attention was given to simplifying the registration process, presenting applicant information systematically, and ensuring that administrative functions could be accessed efficiently through a centralized dashboard. The implementation therefore focused not only on visual appearance but also on usability, consistency, and alignment with the admission workflow at Pondok Pesantren Modern Darel Azhar.



Figure 6. Student Registration Interface

Figure 6 presents the student registration interface used by prospective students to begin the online admission process. Through this interface, users can create an account, enter personal and parent or guardian information, upload supporting documents, and submit the required registration data. The form is organized into sequential stages so that applicants can complete each requirement systematically without being overwhelmed by a large

number of fields on a single page. Input validation is also applied to ensure that mandatory information is completed correctly before the applicant proceeds to the next stage.

The implementation of a structured registration interface improves accessibility and reduces dependence on direct administrative assistance. Applicants and parents can complete the process remotely without being constrained by location or office hours. In addition, submitted information is transferred directly to the centralized database, while digital documents are stored through Cloudinary. This mechanism eliminates repeated data entry by administrators, minimizes the risk of incomplete records, and supports a more efficient and paperless admission process.

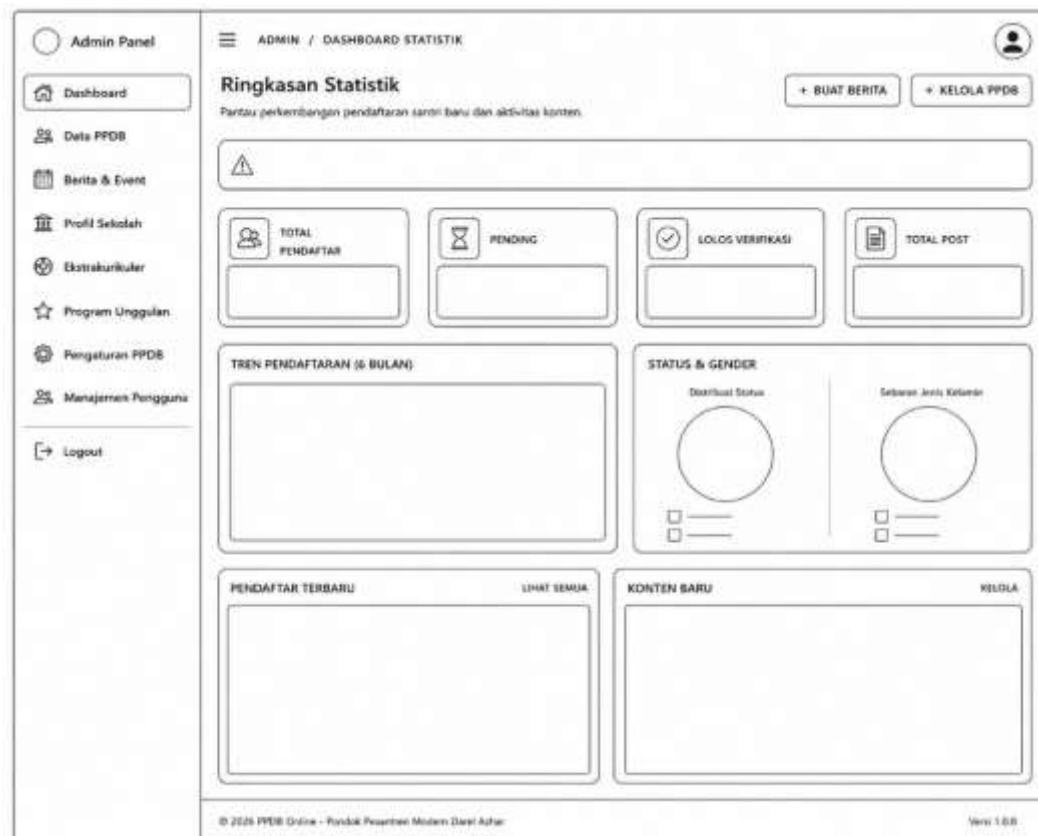


Figure 7. Administrator Dashboard

Figure 7 illustrates the administrator dashboard, which serves as the primary control center for managing the PPDB process. The dashboard provides access to applicant records, document verification, payment validation, registration status, admission settings, and user management. Information is displayed in a structured format to help administrators monitor the number and progress of applicants, identify records requiring verification, and perform follow-up actions through a single integrated interface.

The centralized dashboard improves administrative coordination because data that were previously distributed across different platforms can now be monitored in real time. Role-based access also distinguishes the authority of administrators and super administrators, thereby strengthening system control and accountability. Administrators can conduct operational verification, while super administrators retain broader authority over system settings and account management. Overall, the implemented interface supports faster information retrieval, more accurate verification, and more transparent admission management. These benefits are consistent with previous findings that web-based admission systems

can reduce administrative workloads, improve data accessibility, and enhance service efficiency in educational institutions (Hamdi et al., 2025; Mutammimul Ula et al., 2024; Sanjaya et al., 2025).

System Testing

The developed PPDB information system was evaluated through functional testing using the Black Box Testing method to verify that every system function operated according to the specified functional requirements. This testing method focuses on validating the relationship between system inputs and outputs without considering the internal source code. The evaluation covered the primary functionalities available to both prospective students and administrators, including registration, authentication, applicant data management, document upload, verification, and administrative operations.

Table 1. Summary of Black Box Testing Results

Module	Number of Test Cases	Result
User Module	12	Passed
Administrator Module	6	Passed
Total	18	Passed

The Black Box Testing results indicate that all tested functionalities operated successfully and produced outputs consistent with the expected system requirements. The user module successfully supported account registration, authentication, applicant data entry, document upload, registration submission, and logout processes. Likewise, the administrator module successfully performed authentication, applicant verification, applicant data management, and administrative monitoring functions. No functional failures were identified during testing, indicating that the developed application satisfies the specified functional requirements and is ready to support the online admission process at Pondok Pesantren Modern Darel Azhar. These findings demonstrate that the implementation of Laravel, TiDB Cloud, and Cloudinary provides a reliable platform for managing admission activities through an integrated web-based environment.

User Acceptance Testing (UAT)

Following the functional evaluation, User Acceptance Testing (UAT) was conducted to assess the usability and operational acceptance of the proposed system. The evaluation involved PPDB committee members and representative users who directly interacted with the application. The assessment measured whether the developed system fulfilled the operational objectives of the study, including the implementation of an independent registration website, centralized database management, cloud-based document storage, and overall system usability. System feasibility was considered acceptable when the evaluation score reached at least 80%.

Table 2. User Acceptance Testing Results

Evaluation Aspect	Acceptance (%)
Independent PPDB website	95%
Integrated database management	100%
Cloud storage implementation	85%
System usability	90%
Overall professionalism	95%
Average Acceptance	93%

The UAT results demonstrate that the developed system achieved a high level of user acceptance, with an average acceptance score of 93%, exceeding the predetermined feasibility threshold of 80%. The highest evaluation was obtained for the integrated database management feature (100%), indicating that administrators considered the centralized storage and management of applicant data highly effective. The implementation of a permanent registration website also received a positive evaluation (95%), reflecting users' appreciation of the elimination of dependence on third-party registration platforms. Similarly, the cloud storage feature achieved an acceptance rate of 85%, confirming that digital document submission successfully supports a paperless admission process while maintaining secure document management. Overall, the evaluation confirms that the proposed PPDB information system is functionally reliable, easy to use, and capable of improving the efficiency, transparency, and sustainability of the student admission process at Pondok Pesantren Modern Darel Azhar. Moreover, these findings are consistent with previous studies reporting that integrated web-based admission systems significantly enhance administrative effectiveness and user satisfaction in educational institutions (Hamdi et al., 2025; Hidayati et al., 2024; Sanjaya et al., 2025).

CONCLUSION

This study successfully developed and implemented a web-based New Student Admission Information System for Pondok Pesantren Modern Darel Azhar using the Laravel framework integrated with TiDB Cloud and Cloudinary. The proposed system effectively addresses the limitations of the previous admission process, which relied on third-party platforms and temporary registration links. By deploying the application on Vercel, the institution now has a permanent registration platform that ensures the continuity of admission services while strengthening the school's digital identity. Furthermore, the implementation of TiDB Cloud provides a centralized and cloud-native database capable of securely storing applicant records across multiple admission periods, thereby minimizing the risk of data fragmentation and permanent data loss. The integration of Cloudinary also enables secure and scalable management of supporting documents, facilitating a paperless admission process and improving the efficiency of document verification. Overall, the developed system enhances administrative effectiveness by providing an integrated, reliable, and accessible admission platform for both administrators and prospective students. Nevertheless, further development is recommended by incorporating automated notification services through email or WhatsApp, strengthening security mechanisms through periodic backup and enhanced authentication, and implementing comprehensive reporting and statistical analysis features. These improvements are expected to further increase the reliability, usability, and long-term sustainability of the system while supporting digital transformation in educational administration.

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