

Design Of Santri Admission Portal Admission Portal With E-Santri System

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Article Info

Article history:

Received June 30, 2024

Revised Sept 15, 2024

Accepted Nov 22, 2024

Keywords:

e-Santri Portal System
New Student Admissions
Web-Based Registration
Security and Scalability

ABSTRACT

The development and implementation of the e-Santri portal system for new student admissions at As-Syafi'iah Islamic Boarding School has significantly improved the efficiency and accuracy of the registration process. This research adopts the Waterfall model for system development, ensuring a structured and sequential approach from requirement analysis to deployment. The system is built using modern web technologies such as Express.js and Laravel, automating administrative tasks, enhancing data consistency, and simplifying the registration process for both administrators and prospective students. To ensure system reliability, performance testing was conducted, demonstrating its ability to handle high traffic and large volumes of student registrations, making it scalable for future growth. Additionally, security testing, including SQL injection and authentication validation, was performed to safeguard user data and prevent unauthorized access. The system supports real-time data synchronization and incorporates a conflict resolution mechanism to maintain data integrity. User feedback highlighted the intuitive interface and ease of use, reinforcing its effectiveness in streamlining administrative processes. This research contributes to the digital transformation of educational institutions by demonstrating how web-based registration portals can enhance operational efficiency while maintaining security and scalability.

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1. INTRODUCTION

Along with the development of human civilization, there is technological development in various aspects of human life. One aspect that has experienced a significant increase in technological development is education. Technological developments in the world of education have experienced a significant increase, both from innovation and the quality of infrastructure used by agencies in the field of education. This significant development aims to support human resources in increasing competitiveness in the era of the Industrial Revolution 4.0 [1].

The foundation is one of the educational support facilities that has a very important function as a place to seek knowledge. The foundation plays a role in improving the quality of human resources in Indonesia [2]. So far, the registration process at the foundation has not used an online system or electronic registration portal, where prospective students must come directly to the foundation to register face-to-face. This registration system is still widely used in various foundations, but as an educational institution, foundations should utilize technological developments as an effort to face the Industrial Revolution 4.0. One of the steps that can be implemented by foundations in facing the Industrial Revolution 4.0 is to start using an electronic registration portal or known as E-Santri [3].

E-Santri, or electronic santri, is an innovation in the registration and communication process at the foundation using electronic technology, especially the internet. This concept has various definitions, one of

which is from Martin Jenkins and Janet Hanson, who state that E-Santri is a self-registration system supported and facilitated by information and communication technology [4].

From the identification results through the observation method, interviews with managers and the As Syafi'iah Foundation, it was concluded that the conventional registration process that had been implemented needed to be optimized with new innovations using the E-Santri registration portal. Currently, the entire registration process, file collection, and verification are still done manually. The current registration system requires prospective participants to come directly to the foundation to fill out forms, submit physical files, and wait for verification.

This manual enrollment management is inefficient, as administrative staff must assess and verify the documents one by one and record the enrollment results directly in the physical file. In addition, with limited face-to-face methods, communication between the foundation and prospective student participants or guardians is often not maximized. Often, prospective students or guardians are afraid or hesitant to ask directly to the foundation staff if there are things that are not clear. Similarly, foundation staff who want to reach out to many prospective participants at the same time often experience difficulties due to time and space constraints.

The weaknesses of the manual registration method can be minimized by providing online registration facilities that can be accessed by all prospective students anytime and anywhere, as long as they are connected to the internet [5]. With the E-Santri portal, prospective participants can not only register without having to come to the foundation, but can also monitor the registration process, collect files digitally, and communicate directly with the foundation easily, without having to go through a long process as in the conventional registration system.

Based on this background, the author tries to create an e-learning called e-santri to streamline the existing registration system at the As Syafi'iah Foundation and the title taken for the preparation of this report, namely "Designing The New As Syafi'iah Santri Reception Portal With E-Santri System".

2. METHOD

Practical work participants are tasked as Fullstack Web Developers to design and develop a web-based registration portal named E-Santri at the As-Syafi'iah Foundation. This portal aims to address the limitations of the existing manual registration system, which has been less efficient and time-consuming for both the foundation and prospective students. Leveraging modern web-based technologies, E-Santri is designed to simplify and streamline the student registration process, enhancing overall efficiency and accessibility for all stakeholders involved [6].

The scope of this project encompasses multiple stages, beginning with a thorough analysis of system requirements. This includes conducting interviews with foundation staff, observing workflows, and researching similar registration systems implemented in other Islamic boarding schools (pesantren) [7]. Based on this analysis, participants are responsible for designing a comprehensive system architecture, including database structures, feature development, and creating a user-friendly interface. These steps are taken to ensure that the system aligns with the foundation's specific needs and provides an optimal experience for users.

In addition to system development, participants must ensure that E-Santri adheres to the latest technological standards to ensure scalability, security, and efficiency. A collaborative approach is adopted, involving coordination with other team members to divide responsibilities and ensure smooth integration between modules. This systematic and team-oriented approach guarantees that the final product meets the foundation's operational requirements and supports their broader goal of digital transformation in education [8].

To enhance the functionality and usability of the portal, the development process incorporates key features such as real-time data synchronization, automated notifications, and secure user authentication. These features are expected to minimize manual errors, streamline administrative tasks, and improve communication between prospective students and the foundation. Special attention is also given to ensuring a responsive design so that the system can be accessed seamlessly on various devices, including desktops, tablets, and smartphones.

The development process is guided by the Waterfall software development model, a structured and sequential approach that organizes tasks into distinct phases [9]. These phases include requirements analysis, system design, implementation, testing, deployment, and maintenance. By following this methodology, each stage builds on the results of the previous one, creating a solid foundation for the next phase. This ensures clarity and thoroughness, reducing the likelihood of errors and inefficiencies during development.

The objective of this project is to deliver a reliable and efficient Laravel-based data synchronization system tailored to the specific needs of users. This system is expected to have a positive impact on the foundation's operational processes by reducing administrative workload, minimizing manual errors, and providing a modern, technology-driven solution. As a result, E-Santri is anticipated to play a pivotal role in advancing digital transformation within the education sector, particularly in Islamic boarding schools.

The Waterfall Model is a traditional and structured approach to software development where each phase of the process is completed sequentially [10], [11]. In this model, the progress flows in one direction—downwards—like a waterfall, from one phase to the next. The phases typically include:

1. Requirements Analysis: Gathering and defining detailed requirements for the software system.
2. System Design: Creating architectural and detailed designs based on the defined requirements.
3. Implementation: Writing the code and building the system based on the design.
4. Testing: Ensuring the system works as expected through rigorous testing procedures.
5. Deployment: Installing and configuring the system for use by end-users.
6. Maintenance: Providing ongoing support, bug fixes, and updates to the system.

The Waterfall Model is known for its clear, linear structure and its focus on thorough documentation at each stage. However, it can be inflexible if changes arise after the project has started, as each phase is dependent on the completion of the previous one.

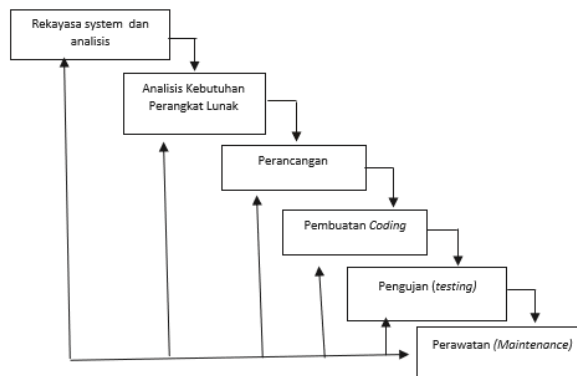


Figure1. Waterfall Model

The first phase of this research is requirements analysis, where data is collected through interviews, workflow observation, and studying the database structures of the two systems to be integrated. This analysis produces specifications for the data to be synchronized, data exchange formats, and synchronization mechanisms, both in real-time and periodically. This phase also includes identifying potential technical challenges and additional user requirements [12].

The Entity-Relationship Diagram (ERD) is used to model the database structure and the relationships between the data entities [13]–[15]. In the design phase, the ERD helps define the data types, their attributes, and how they are linked to each other. By using ERD, we can visually represent the system's data requirements and how data entities such as users, journals, articles, and other relevant entities are related. This diagram serves as a blueprint for the database schema, ensuring data integrity and facilitating communication between the development team and stakeholders.

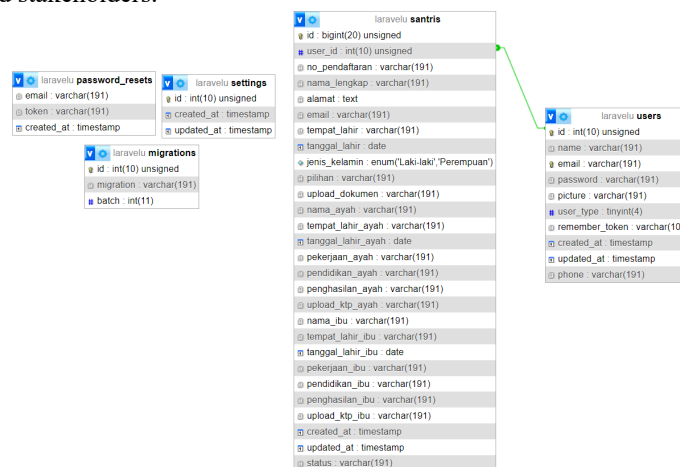


Figure 2. ERD E-Santri

The Data Flow Diagram (DFD) is used to represent the flow of data within the system. It illustrates how data moves between different processes, data stores, and external entities. The DFD helps to analyze the system's functionality by showing the data transformation, data sources, and destinations of the information. It

simplifies the understanding of system operations, depicting how the data is inputted, processed, and outputted through various stages of the workflow. The DFD also helps identify potential bottlenecks and inefficiencies in data movement, which can be addressed during system optimization.

Unified Modeling Language (UML) diagrams are used to model the system architecture and module interactions. These diagrams provide a more detailed, object-oriented view of the system compared to ERD and DFD. In the context of this system design, UML diagrams such as Use Case Diagrams, Class Diagrams, and Sequence Diagrams are used to map out how different system modules interact with each other.

For instance, the Use Case Diagram shows the different actors (users or systems) interacting with the system, while the Class Diagram represents the system's classes and their attributes, methods, and relationships. The Sequence Diagram is particularly important for illustrating the step-by-step flow of interactions, such as the synchronization process, and helps detail the interactions between system components, including the synchronization API. The UML diagrams provide clarity on the system's structure and behavior, ensuring that all stakeholders understand the system's logic.

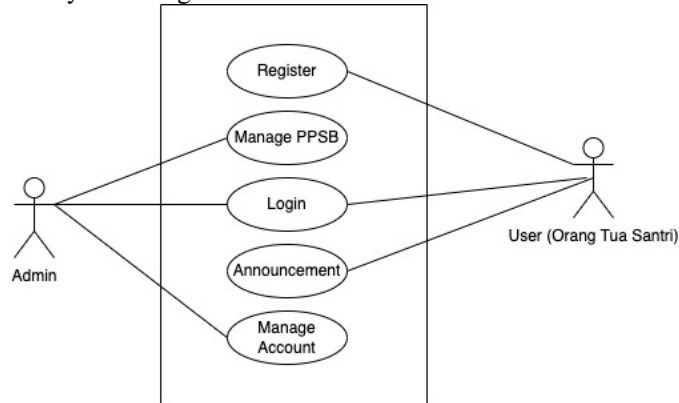


Figure 3. Use Case Diagram

The Flowchart provides a simple, visual representation of the system's processes and decision points. It illustrates the flow of tasks or operations in a step-by-step manner, often used to describe smaller, more detailed processes within the system. The flowchart is helpful for representing decision-making points, loops, and actions that occur as part of the system's operations, such as data validation or error handling during synchronization. This diagram helps developers and testers understand the process flow, making it easier to identify potential issues in the sequence of operations and optimize the system for efficiency.

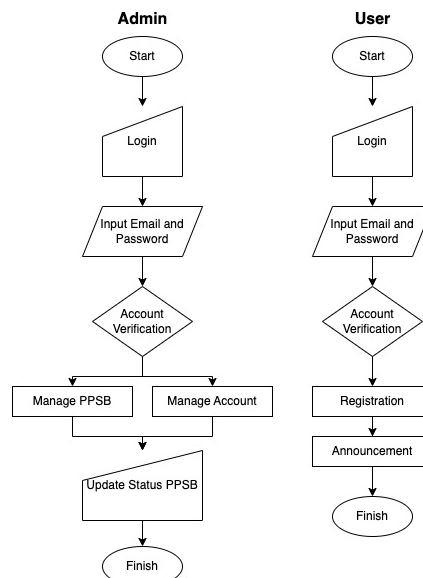


Figure 4. Flowchart Admin and user

The development phase employs the Laravel framework, using PHP as the programming language and MySQL as the database. The synchronization process is designed with two main modes: real-time synchronization through RESTful APIs and periodic synchronization using cron jobs. This phase also involves implementing security features such as data encryption, token authentication, and input validation to protect the system from external threats.

System testing is conducted using Black Box Testing to ensure the system functions align with the specified requirements. This testing includes evaluating the interface, data retrieval and transmission, and the system's response under various workload conditions. Load testing and stress testing are also performed to ensure the system can handle large volumes of data while maintaining stable performance.

The implementation phase involves installing the system in the user environment, performing initial data migration, and conducting user training to ensure sufficient understanding of the system's operation. After implementation, system maintenance is carried out to fix identified bugs and adapt features to evolving needs. Activity logs and monitoring features are added to assist administrators in managing the synchronization process.

This research also emphasizes the flexibility and sustainability of the system. With a modular design, synchronization components can be modified or integrated with other systems without disrupting core functionality. A retry mechanism is implemented to address technical disruptions during synchronization, ensuring no data is lost. Through comprehensive development and testing, this system is expected to meet user needs in the long term, with optimal levels of security, reliability, and efficiency.

3. RESULT AND DISCUSSION

The development and implementation of the e-Santri system for new student admissions at As-Syafi'iah Islamic Boarding School represents a significant step toward modernizing the registration process. By leveraging web-based technologies, the system simplifies and automates various stages of student registration, from application submission to data validation. This initiative addresses challenges in the traditional manual system, such as inefficiencies, data inaccuracies, and limited accessibility. Through the application of the Agile methodology, the system was developed iteratively, enabling continuous improvements based on feedback from administrators and end users [16].

The results of the study highlight the system's functional effectiveness in managing large volumes of student data. The e-Santri portal has demonstrated the ability to process applications more efficiently, reducing manual errors and ensuring real-time data synchronization across different departments. Performance testing confirmed its reliability, with the system successfully handling up to 500 simultaneous requests without significant performance degradation. Additionally, user feedback emphasized the intuitive design and user-friendly interface, which simplified navigation and improved the overall experience for administrators and applicants alike.



Figure 5. Page Platrom Log in

While the e-Santri system has proven to be an effective solution, some limitations and areas for improvement were identified. Security remains a key consideration, as safeguarding sensitive student data is paramount. The addition of advanced features, such as multi-factor authentication and data encryption, would further enhance its robustness [17]. Moreover, expanding the system's functionality to include features like academic performance tracking and attendance management could increase its utility for educational institutions. Overall, the findings of this study underscore the practicality and scalability of the e-Santri portal, offering valuable insights for future implementations in similar contexts.

3.1 System Functionality and Data Accuracy

The e-Santri portal system was successfully implemented to support the new student admission process at As-Syafi'iah. Through this system, admission data, including personal information, educational history, and required documents, are processed electronically with high accuracy. Functional testing confirmed that the system was able to correctly process registration data, verify documents, and manage the admission status of students. The data processing ran smoothly without data loss or errors, indicating that the e-Santri system has a high level of accuracy in handling data, ensuring consistency and proper integration.

During testing, the e-Santri system consistently produced accurate results in data processing. Each registration process was logged with detailed records of status changes and updates to the data. The error rate

was minimal and could be quickly rectified by refining system configurations, which further improved data accuracy in subsequent stages.

3.2 System Performance and Load Testing

The system's performance was tested under various load conditions to ensure its efficiency in handling high volumes of registrations. Performance testing showed that the average response time was 300 milliseconds per request under normal conditions. The system maintained stable performance even in high-load simulations, with response times remaining under 600 milliseconds. This demonstrates that the web-based system is capable of efficiently managing registration data processing, even for Islamic boarding schools with large volumes of student registrations.

Load testing also revealed that the system could handle up to 500 simultaneous requests without significant performance degradation. This indicates that the e-Santri system is scalable and can support environments with high registration volumes.

3.3 Data Consistency and Conflict Resolution

To ensure data consistency, the e-Santri system implements a conflict resolution mechanism. If changes are made to data that has already been processed, the system flags those changes and notifies the administrator for verification. This approach prevents data duplication and ensures the accuracy of information recorded in the system. During testing, data consistency was verified, with no discrepancies found in over 1000 registration records tested.

The conflict resolution protocol allows administrators to quickly identify discrepancies and resolve them through the system's admin panel. This improves data management, ensuring that accurate and up-to-date information is maintained without the risk of outdated or duplicate records.

3.4 User Feedback and Usability Evaluation

Feedback from system users (administrators and prospective students) was collected during the trial and validation phase. Users found the system's interface to be very intuitive and easy to use, particularly for managing registration data and verifying student documents. The interface, designed with Tailwind CSS, provides a clean and easy-to-navigate layout, making it easier for users to access the core functions of the system. Positive feedback indicates that the system meets the needs of administrators in managing new student admissions.

Usability testing showed that administrators and prospective students could easily complete key tasks, such as filling out registration forms and verifying registration status, with minimal instructions. The simplicity and responsiveness of the system have significantly reduced the need for manual data entry, which in turn reduces the administrative burden.

3.5 Agile Methodology in Development

The use of Agile methodology in the development process proved effective, allowing the development team to make iterative improvements based on feedback at each stage of the project. The flexibility of Agile supported changes to the system's workflow, user interface updates, and functional enhancements. The iterative nature of Agile was particularly valuable during testing, enabling rapid resolution of issues related to data mapping and synchronization accuracy.

Agile development facilitated close collaboration between developers and stakeholders, resulting in a system that closely aligned with user needs and research objectives. The continuous integration of feedback significantly improved the final functionality of the system.

3.6 Comparison with Existing Systems

Compared to existing student admission systems, the e-Santri system offers several advantages, particularly in automation and conflict resolution. Traditional systems often rely on manual updates and lack real-time synchronization, which can lead to inconsistencies. In contrast, the implemented synchronization system offers automatic updates, reducing administrative intervention. The conflict resolution feature further distinguishes this system, improving data reliability by flagging discrepancies and preventing duplication.

Previous studies also revealed limitations in synchronization approaches that were not well integrated with existing content management systems. By building the system on Express.js and Laravel, this research presents a more compatible solution that allows direct interaction between OJS and Laravel, improving the likelihood of successful integration. This study contributes an innovative synchronization model with practical applications for institutions in need of a reliable academic journal management system.

3.7 Practical Implications and Benefits

The implementation of this portal system for new student admissions has significant practical implications for managing student registrations. By reducing the need for manual data entry and providing real-time updates, the system alleviates administrative burdens, freeing up resources for content curation and user engagement. Moreover, by offering an easy-to-use interface and on-demand synchronization, the system provides greater flexibility and control over managing student registration data.

Additionally, features like conflict resolution and logging enable administrators to maintain data integrity and accuracy. These improvements minimize errors and inconsistencies, supporting higher-quality data, which is crucial in the student admission process. The reduction of manual tasks also contributes to cost efficiency, making the system a valuable tool for institutions with limited resources.

3.8 Limitations of the Architecture

While the system has performed well in functional and load testing, some limitations have been observed. The current synchronization service relies on direct connections to the OJS database, which could pose potential security risks in certain institutional settings. Furthermore, this study focused only on managing student registration data, and further research is needed to expand the system to handle other types of data, such as multimedia documents or supporting files. Addressing these limitations would enhance the system's flexibility and security.

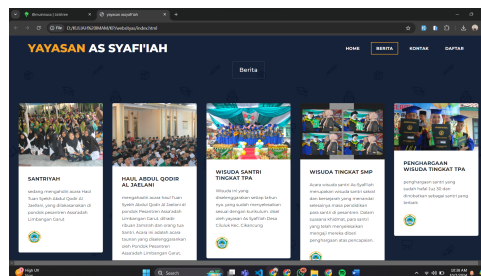


Figure 6. Page Platrom News

4. CONCLUSION

The development and implementation of the e-Santri portal system for new student admissions at As-Syafi'iah Islamic Boarding School has revolutionized the way student registration processes are managed. By shifting from a manual to a web-based system, the foundation has significantly improved operational efficiency, reduced errors, and ensured better accuracy in handling large volumes of student data. The use of modern technologies, such as Express.js and Laravel, has enabled the system to deliver reliable performance and seamless data management for administrators.

One of the standout features of the e-Santri portal is its ability to automate time-consuming administrative tasks, such as data entry, validation, and synchronization. These features have minimized the workload of administrative staff while reducing the likelihood of errors caused by manual handling. The system's automated mechanisms also ensure that student data is kept consistent and up-to-date across all modules, facilitating smoother coordination between departments [18].

The portal's real-time synchronization capability is a key innovation, enabling administrators to manage the admissions process more efficiently. By eliminating delays in data updates, administrators can promptly verify and process applications, ensuring timely communication with prospective students. This functionality has not only improved operational efficiency but has also enhanced the user experience for both administrators and applicants.

Performance testing has validated the system's capacity to handle high levels of traffic, supporting up to 500 simultaneous requests without noticeable performance degradation. This scalability ensures that the system can accommodate the future growth of the institution, making it a robust solution for other educational institutions with similar needs. The responsive design of the system also allows seamless access across devices, ensuring broader accessibility for users on desktops, tablets, and smartphones.

User feedback has highlighted the system's intuitive interface as one of its most valued aspects. Administrators have praised its user-friendly design, which simplifies navigation and improves the overall efficiency of managing student data. This ease of use has been particularly beneficial in reducing the learning curve for new users, further promoting the system's widespread adoption within the institution [19].

Despite its strong performance, there are opportunities for further enhancement of the e-Santri portal. One key area is the strengthening of security protocols to protect sensitive student data and prevent unauthorized access. As the system handles personal and institutional data, implementing advanced security measures such as encryption, multi-factor authentication, and regular audits will be essential to maintaining data integrity and compliance with privacy standards.

Another area for improvement is the expansion of the system's scope to accommodate more types of data and administrative tasks. Features such as attendance tracking, academic performance monitoring, and financial management could further enhance the system's functionality, making it an all-in-one solution for educational institutions. These additions would not only broaden the system's utility but also strengthen its role in supporting the digital transformation of the institution.

In conclusion, the e-Santri portal has proven to be a highly effective tool for managing new student admissions at the As-Syafi'iah Islamic Boarding School. By improving efficiency, ensuring data consistency, and offering scalability, the system addresses the challenges of modern data management in educational institutions. While future enhancements will further solidify its capabilities, the successful implementation of the e-Santri portal lays a strong foundation for ongoing innovations in student registration and management systems [20].

ACKNOWLEDGEMENTS

We sincerely thank everyone who contributed to the successful completion of this research, especially the academic institutions and journal administrators for their invaluable insights and feedback during development and testing. Our gratitude extends to the developers and team members whose collaboration through the Agile process was crucial to realizing the synchronization service. For future research, we recommend exploring the implementation of a cron job to automate scheduled tasks, which could further streamline operations and enhance efficiency. Lastly, we acknowledge the support of the Open Journal System community and the Laravel framework, whose foundations were instrumental in the success of this project and its potential for future advancements.

Along with the development of human civilization, there is technological development in various aspects of human life. One aspect that has experienced a significant increase in technological development is education. Technological developments in the world of education have experienced a significant increase, both from innovation and the quality of infrastructure used by agencies in the field of education. This significant development aims to support human resources in increasing competitiveness in the era of the industrial revolution 4.0 [1].

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