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Implementation of Academic Information System at Al-Inayah Pamulang Quran House, South Tangerang

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Abstract: In today's digital era, technology profoundly influences various societal domains, notably education. Rumah Quran Al-Inayah Pamulang, a non-formal educational center in Tangerang Selatan, fosters Quran memorization and practice among Muslim children. However, its manual system requires enhancement for better accuracy and timeliness in managing information. A web-based academic information system is proposed, utilizing the waterfall model methodology to address this. This system aims to streamline data collection, monitor memorization progress efficiently, and ensure organized data storage. The Academic Information System of Rumah Quran Al-Inayah Pamulang is a digital platform facilitating student information management, activity scheduling, academic progress tracking, and parent communication.

Keywords: Rumah Quran Al-Inayah Pamulang; Academic Information System; Non-Formal Education; Waterfall Methodology.

1. Introduction

Changes in the times are developing so rapidly that technological sophistication has become a primary need for people's lives in the modern era, especially information technology. The use of information technology in every aspect of life is essential [1]. Information technology is used in almost all areas of life, such as education, health, business and management, agriculture and animal husbandry, mining, defense and security, and transportation. Information technology can make it easier for people to get the data and information they want. Current developments in information have a powerful impact, especially in education [2]. Educational institutions currently process and administer a large amount of data, including students, teachers, and staff. Academic data is often in large quantities and can change at any time, so storage and administration must be done well and continuously updated. Administration demands goal-oriented efficiency and effectiveness, as well as the use of resources and processing mechanisms in the future. It can be used as a source of information needed at any time [3]. Information users in educational institutions include internal users such as students, teachers, and staff and external users such as people. Academic institutions are expected to provide quality information [4]. The quality of information depends on three things: namely, information must be accurate, timely, and relevant. To achieve these three criteria, a professional management information system is needed. Most schools use a manual management system or computers to manage academic data but do not use the Internet. This system has weaknesses such as the administration system, waste of energy, less than optimal service, and low data quality [5].

Al-Inayah Qur'an House is a non-formal educational institution aiming to enable its students to become memorizers of the Qur'an who can apply their spiritual knowledge in everyday life and become a generation of achievers. However, based on the results of interviews, the recording of verse deposits at Rumah Qur'an Al-Inayah still uses manual methods. Memorizing memorized by students is written on a list of memorized verses on sheets of paper, which are vulnerable to loss and damage [6]. Apart from that, memorization assessment must be accurate because there is no tahfidz storage database. The recording system is only in the form of a checklist on the memorized list of verse deposits. As a result, the results of tahfidz activities could be more optimal. Based on these problems, this form of community service activity is designing an information system to record deposits for memorizing verses (tahfidz) as a refinement of the information system for recording memorized verses (tahfidz) at Tahfidz Al Inayah House. This activity aims to increase efficiency and accuracy in recording and assessing memorization of the Al-Qur'an. Based on the description above, the author is interested in carrying out community service activities titled: Implementation of the Al-Inayah Qur'an House Academic Information System Pamulang South Tangerang.

React JS or React is an open-source Javascript library that develops more interactive user interfaces and makes it easier for developers to design applications. React JS is used to handle view layers in single-page applications and mobile applications. React JS is maintained by Facebook, Instagram, and a community of developers [7]. React JS strives to provide speed, simplicity, and scalability. Some of the commonly known React JS features are JSX or Javascript XML. JSX is an extension for ECMAScript syntax. JSX helps developers develop UI in Javascript and can also help developers debug errors [8]. The MVC concept or Model View Control in React JS only presents the View part, which is the best part of React JS because it is simpler [9]. React JS front end is a part of software development that focuses on a web application's appearance or user interface (UI/UX) in JS action. In front-end development using React, developers create components that manage their state and can update the user interface efficiently when data changes.

Ant Design System is an open-source code for enterprise-level React UI libraries. It was created and designed and is currently used by big names such as Alibaba, Tencent, Baidu, Lenovo, and others. Ant Design is a library containing components used to create interactive UIs, which are easy to use and integrate. Ant Design is one of the most popular UI libraries on Github, with over 56 thousand ratings/stars in 2021, growing from around 40 thousand in 2018 to more than 340 thousand downloads on npm. The Ant Design library consists of several codes, namely 43.7% TypeScript, 31.1% JavaScript, 24.9% Less, and 0.3% other. Ant Design's design values provide internal standards for evaluation and inspiration for designers, as well as providing guidance and solutions for specific design problems. The back end is the part of the application responsible for providing invisible needs to the user (not interacting directly with the user), such as how data is stored, processed, and transacted securely. It all aims to support frontend applications in working according to their function. A figure in this field is called a Backend Developer [10]. The backend, with Express.js and Node.js, is the software development related to a web application server. With Node.js, developers can write server-side code using JavaScript, previously more commonly used on the client side. Using Express.js on top of Node.js, developers can create efficient and reliable servers to handle the business logic, data storage, and

database interaction required in modern web applications [11]. It enables communication between the client (frontend) and the server (backend) so that the application can function properly and present data to the user.

PostgreSQL is an open-source and robust relational database management system (RDBMS). In software development, PostgreSQL stores organizes and manages data in an application. PostgreSQL is often called a "database" or "database" in everyday language. This database uses a table structure and relationships between tables to store data in a structured format [12]. This allows users to store data in an organized way. Then, operations such as adding, changing, deleting, or retrieving data from these tables will be performed. In software development, PostgreSQL stores information such as user profiles, product data, transaction history, and more. One of the popular choices for storing data in web and business applications because of its reliability and support for various features needed in data management [13].

Rumah Qur'an Al-Inayah is a community that houses memorizers of the Qur'an, especially Muslim children, in memorizing the Qur'an, practicing and applying the values of the Qur'an in everyday life and being responsible for The implementation of the tahfidz programs created includes coaching, supervision, and development. Rumah Qur'an Al Inayah has a program goal that must be achieved; namely, Rumah Qur'an Al Inayah was formed to make children love the Qur'an more from an early age by providing quality Al Qur'an education and good moral guidance. Both are based on the guidance of the Qur'an and As-Sunnah and ensure that the younger generation is maintained and instilled in the children by memorizing the Qur'an. Information technology has become a basic necessity in modern society in an era that continues to change and develop rapidly. The use of information technology is widespread in various fields, including education, health, business, and others, having a significant impact on everyday life. Along with this progress, educational institutions such as Rumah Qur'an Al-Inayah Pamulang South Tangerang are also adapting to technology to improve the quality of their services and operational efficiency. In this context, implementing an academic information system is an essential step in overcoming administrative challenges, increasing the accuracy of recording, and improving the process of assessing the memorization of the Al-Quran. Thus, it is hoped that this effort can make a positive contribution to the development of education at Rumah Qur'an Al-Inayah Pamulang South Tangerang, as well as improve the quality and effectiveness of the educational services provided.

2. Research Method

2.1. Waterfall Method

The waterfall method creates or develops information systems or software. This method emphasizes sequential or systematic phases, which can be analogous to a waterfall, where each stage is carried out sequentially, with the stages of requirements analysis, design, development, testing, and maintenance [14]. The following is an explanation of each stage:

1) Needs Analysis

Requirements analysis is a process to obtain information, modes, and specifications about the software clients/users want. Both parties, namely the client and the software developer, are actively involved in this stage—information from clients that will be a reference for designing software. Requirements analysis is one of the many critical activities in the software requirements engineering process to understand the running system's problem domain and the system's solution domain to be created [15]. At this stage, we held a Google Meet meeting with Rumah Tahfidz Al Inayah Pamulang and asked what was needed.

2) UI Design

UI design is creating the appearance and interactions of a user interface. This involves using visual elements such as color, typography, and layout to create an attractive, easy-to-use interface. To develop compelling interfaces, UI designers must understand user psychology and how people interact with technology [16]. Here, we use UI Ant Design to design the system.

3) System Development

After analyzing the needs and designing, we go straight to working/developing the application/system using React JS and Express Node JS. For the database, we use PostgreSQL.

4) Testing

The web testing stage is crucial in website development. It ensures that the website functions optimally and provides a positive user experience. Before we launch the website, we test its functions to ensure that they are appropriately used.

5) Maintenance

Website maintenance is the process of caring for and maintaining a website so that it continues to function optimally, safely, and relevantly.

2.2. Business Needs Analysis

Rumah Qur'an Al-Inayah Pamulang South Tangerang is a non-formal educational institution that aims to develop a generation that loves the Qur'an, has good morals, has an Islamic personality, is knowledgeable, and has a broad understanding of Islam. The primary mission is to ensure that Muslim children can read the Koran properly according to tajwid, memorize it from an early age, overcome Koranic illiteracy, and introduce them to correct Islamic teachings according to the Koran and As-Sunnah. Apart from that, this institution is also committed to forming good character in children, guiding them in daily practices according to Islamic teachings, and developing the ability to read, write, memorize, and practice the contents of the Koran. In this research, technology integration is needed to support the vision and mission of Rumah Qur'an Al-Inayah. Technology will help record student data, schedule activities, monitor academic progress, and communicate with parents. By using a website-based academic information system, efficiency and accuracy in the administration and assessment of Al-Qur'an memorization can be improved, thereby positively contributing to achieving this institution's educational goals.

2.3. Information Needs Analysis

In carrying out all academic activities, especially those related to managing student/student data, Rumah Qur'an Al-Inayah requires an information system that can accommodate their needs effectively. This includes but is not limited to, recapitulating data on memorizing the Qur'an and memorizing verses, as well as recording the academic development of each student. Based on a review of the foundation's needs, researchers understand that providing an adequate information system is very important. Therefore, researchers intend to provide a solution to overcome these challenges: a web-based academic information system. This system is expected to optimize the data collection process, monitor the progress of memorizing the Koran, and provide easier access for related parties, including parents or guardians of students. With an integrated and easily accessible information system, it is hoped that Rumah Qur'an Al-Inayah can increase data management efficiency, improve education quality, and help better achieve the foundation's vision and mission goals. This will also make a positive contribution to the academic and spiritual development of the students, as well as facilitate the communication process between the foundation, educators, students, and parents.

2.4. Technology Needs Analysis

Technology needs analysis identifies and evaluates the technology needs required by an organization or individual to achieve set goals. So, through the results of interviews with the administrators of Rumah Tahfidz Al Inayah, their technology needs are:

1) Halaqah management

This data contains personal information from students, teachers, and operators. This will make identifying students, teachers, or operators easier. The halaqah data also includes student and teacher attendance data, making it easier to recapitulate attendance.

2) KBM/Tasmi' Management

In KBM/Tasmi Management, it is used to manage data containing student memorization progress and Tasmi exams that have been deposited so that progress can be easily monitored by teachers or operators.

3) Data Recapitulation Management

We can use this feature to recap memorized deposit data or for tahfidz report cards so it will be more efficient and time-saving than using a manual system.

3. Result and Discussion

3.1 Results

In developing a planned application system, several stages need to be understood to understand the operational flow. First, the user or admin must be connected to the internet to access the application. Once connected, users or admins can access the application to add, view, or delete data stored in the database. This data can be viewed in report form using a customized template. Details of the application's operational flow can be seen in Figure 1 below.

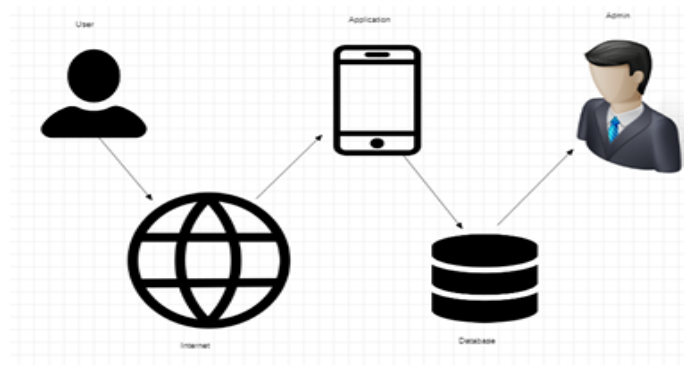


Figure 1. Operation Flow

SWOT analysis is used to identify strengths, weaknesses, opportunities, and threats to a particular business or project. The SWOT analysis produces several findings for the planned academic information system that must be considered. One of the main strengths of the designed academic information system is efficiency in data collection. By using a web-based system, the time and effort required for administration can be reduced significantly. The data collection process becomes faster and more efficient, reducing the potential for errors and freeing up energy for other activities. Apart from that, this system also allows easier monitoring of students' memorization progress. Information regarding memorizing the Al-Qur'an can be accessed in real-time from anywhere and at any time, making supervision easier for management. Using a web-based system also provides benefits such as saving resources. Without dependence on paper and pens, the costs of procuring stationery can be minimized. In addition, the data stored in the academic information system database is guaranteed to be secure and neatly arranged, making data access and management more effortless. One weakness that needs to be considered is the dependence on the internet network to access the system. Even though this system provides easy accessibility, limited internet access can hinder its use, especially in areas with poor connectivity. Adopting a web-based academic information system is a huge opportunity to save costs and administrative time. A more efficient administrative process can allocate available time to other, more value-added activities.

Additionally, there are opportunities to add new features to the system to meet additional needs. For example, this system can be developed to automatically recapitulate report cards, speeding up and simplifying the academic reporting process. The main threat you need to be aware of is the possibility of a slow process due to a weak internet network or problems with the database. Dependence on technological infrastructure can cause disruptions in system use, potentially hampering data collection and monitoring processes. Another threat is a lack of system understanding, which can cause inefficiencies or data input errors. Sufficient training and assistance are required for users to utilize the system optimally and minimize the risk of errors.



Figure 2. SWOT Analysis

Application/information system development uses the waterfall approach, which prioritizes sequential and systematic phases in the development process. The development stages begin with a needs analysis, where the development team meets with Rumah Tahfidz Al-Inayah Pamulang to understand the needs of users and clients for the system to be developed. The information obtained from these meetings becomes the basis for designing technical specifications and system functionality [17]. Next, the development team designs the user interface (UI) appearance in the UI design stage, considering the layout, colors, typography, and interactive elements used [18]. Ant Design UI was used in this development because of its ease of integration and simplicity. Once the UI design is approved, developers start writing code using technologies like React JS for the front end and Express Node JS for the back end in the system development stage. A connection to a PostgreSQL database is also set up to store and manage application data. The next stage is testing, where the system is tested to ensure that its functions meet specifications and provide a positive user experience. Finally, maintenance occurs after the application/system launch, involving regular performance monitoring, software updates, and periodic fixes and maintenance to keep the application-optimized, secure, and relevant to user needs. By carrying out each stage in a structured manner, it is hoped that the development of the application/information system for Rumah Tahfidz Al-Inayah Pamulang can run smoothly and produce practical solutions according to user needs.

Tabel 1. Impact Analysis Matrix

No.	Organizational Needs	Influence in the IT Field
1	Business Needs	More efficient data collection. This web-based system will make it easier to access the information needed. It can be accessed anywhere on the internet. Facilitate information needs.
2	Information Needs	Personal information and attendance of students, teachers, and operators. Implementation of an information system based on a database of input data. Memorization progress. Data recapitulation and report cards.
3	Technology Needs	IT Instructor Software. Hardware. Network.

Table 1 Impact Analysis Matrix detailing the relationship between organizational needs and their implications for Information Technology (IT). Three main need categories were identified: business, information, and technology. Meanwhile, the "Influence in the IT Sector" column describes the impact or consequences of each organizational need on the information technology domain. First, the organization's business needs to focus on increasing efficiency in the data collection process. Implementing a web-based system allows easy access to necessary information from various locations connected to the internet. This way, the organization's information needs can be met more effectively. Second, organizational information needs involve personal data management and monitoring student, teacher, and operator attendance. Organizations can store and manage this information systematically through a database-based information system. This system also facilitates monitoring students' memorization progress and automatically prepares reports and report cards. Lastly, an organization's technology needs include software, hardware, and network infrastructure. The availability of appropriate software and hardware, including the need for qualified information technology personnel, is crucial in supporting information system operations. Meanwhile, reliable network infrastructure is the foundation for continued accessibility and overall system security. Through this matrix, organizations can identify more clearly how each of their internal needs impacts the information technology domain. This helps them make more informed decisions regarding the development and implementation of information systems that suit the organization's overall goals and needs.

The system developed has several functions and features designed to efficiently meet organizational and operational needs, including halaqah management, KBM/time management, and data recapitulation management. These functions include login, student, teacher, operator, halaqah data management, and student and teacher attendance management. Apart from that, the system also includes features for memorization management and taste exams, as well as a recapitulation of statistical data and student tahfidz report cards. The technical specifications of this system have also been clearly defined. Software specifications include the programming language used (HTML, CSS, React JS, and Express Node JS), framework (Bootstrap), and development software (Visual Studio). Supported operating systems include Windows, Mac, and Android, with access via a web browser. Any device that can access a web browser and connect to the internet will meet the hardware requirements for this system. Thus, both software and hardware specifications that have been determined will support overall system functionality and accessibility. The program system design

includes several diagrams and displays of program results designed to visualize the workflow and interactions in the system. First, there is a map diagram, which describes the movement of objects from one place to another in the system. It helps analysts and programmers break down problems into smaller segments and analyze other alternatives in production (Figure 3).

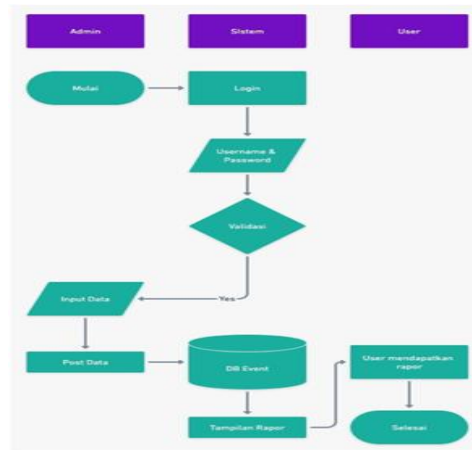


Figure 3. Flow map Diagram

Next is the Use Case Diagram, a type of UML diagram that describes interactions between systems and actors [19]. This diagram describes the kind of interaction between system users and the system, which is essential for modeling and understanding actor actions with system actions (Figure 3).

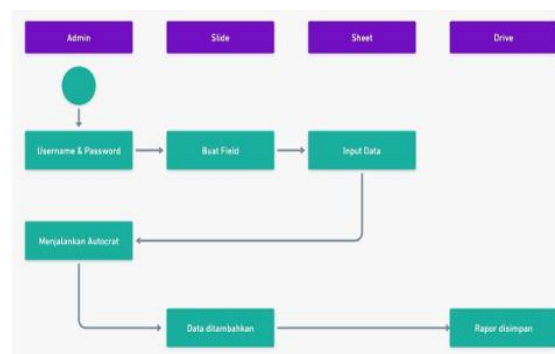


Figure 4. Activity Diagram

Activity Diagrams are also used in system design, which model the processes that occur in the system vertically [20]. This is a development of a use case that displays the flow of activities in the system (Figure 4).

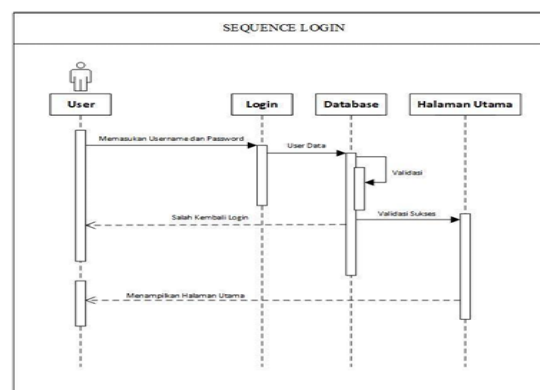


Figure 5. Login Sequence Diagram

Sequence Diagrams are a type of UML diagram that is important in system development. This diagram describes the interactions between objects in the system sequentially. Through Sequence Diagrams, we can

understand how objects communicate with each other during the execution process. The main goal is to describe the workflow of an activity in the system so that the output produced is as desired. An example of a Sequence Diagram can be seen in Figure 5. Apart from the Sequence Diagram, the Entity-Relationship Diagram (ERD) is also an essential component in system development. ERD models data structures in a database by describing the relationships between entities and their attributes. Through ERD, we can understand how the entities in the system interact and how data is stored and linked in the database. Figure 6 shows an example of an ERD that illustrates the data structure in a system.

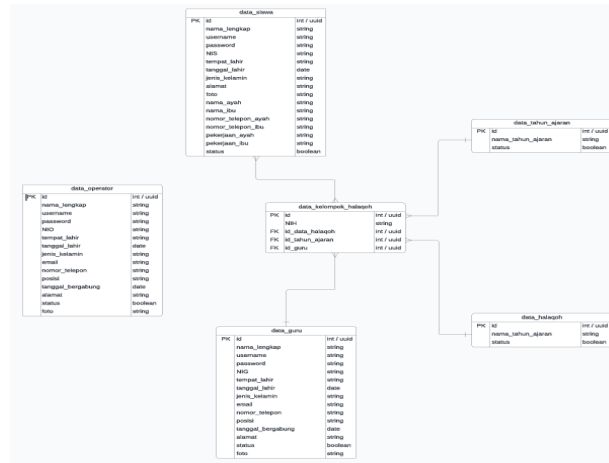


Figure 6. Entity Relationship (ER) Diagram

In addition, several program results displays are also included to show the interface used in this application. These displays include the login page (Figure 7), student data page (Figure 8), student data detail page (Figure 9), teacher data page (Figure 10), teacher data detail page (Figure 11), and operator data page (Figure 12).

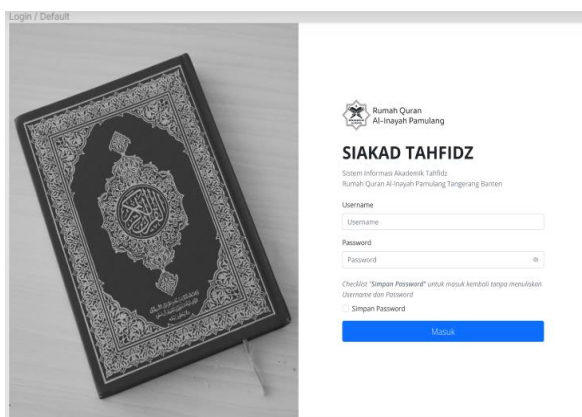


Figure 7. Login page display

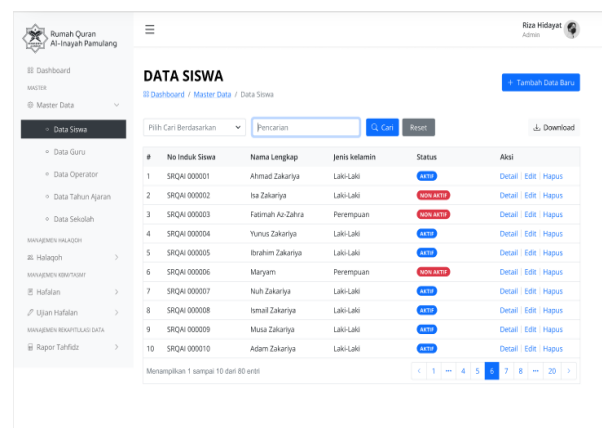


Figure 8. Student Data Page Display

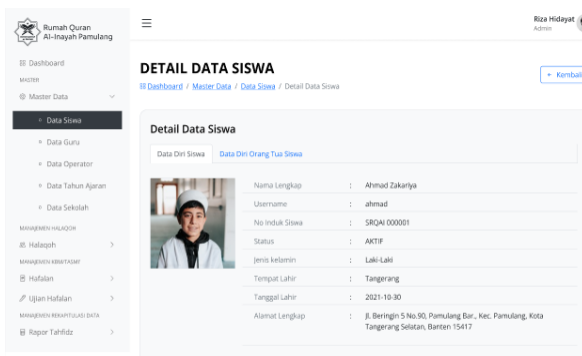


Figure 9. Student Data Details Page Display

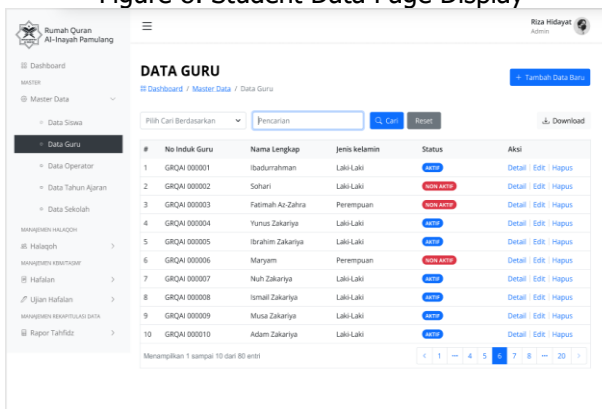


Figure 10. Teacher data page display

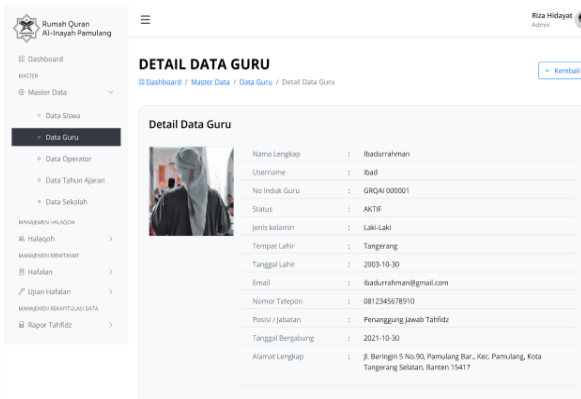


Figure 11. Teacher Data Details Page Display

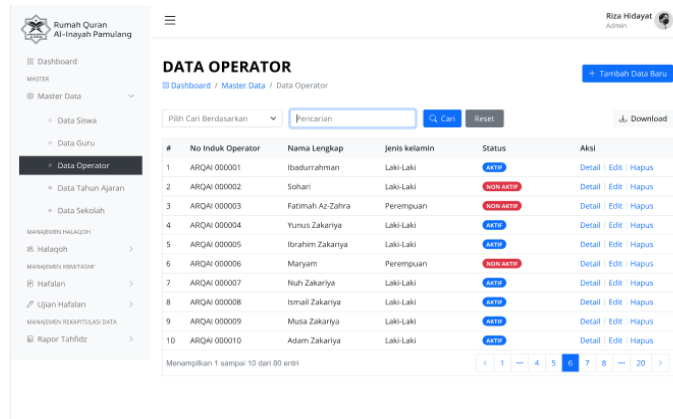


Figure 12. Operator Data Page Display

The interview results on November 17, 2023, with Rumah Tahfidz Al-Inayah provided a clear picture of the organization's vision and goals. Rumah Tahfidz Al-Inayah is a community that aims to develop memorizers of the Quran, especially Muslim children, who study, memorize, and practice the values of the Quran in everyday life. This community is responsible for coaching, supervising, and developing the tahfidz program, focusing on providing quality Al-Qur'an education and developing good morals based on the guidance of the Al-Qur'an and As-Sunnah. One of the main goals of Rumah Tahfidz Al-Inayah is to create a young generation who loves the Qur'an from an early age. They are determined to provide quality teaching and good moral guidance to children, with the hope that their love for the Qur'an will grow along with their understanding and appreciation of the contents of the holy book. Besides that, Rumah Tahfidz Al-Inayah also wants to ensure that the younger generation is maintained and has the values of the Qur'an instilled in them as memorizers of the Qur'an. To achieve these goals, Rumah Tahfidz Al-Inayah has formulated several indicators of program success. These indicators include reaching the target of memorizing the Qur'an, forming a community-based religious area, and the role of Rumah Tahfidz Al-Inayah as a place for learning the Qur'an for the community, especially the younger generation. They also want to see an increase in love for the Koran, knowledge of the Islamic religion, ability to communicate in Arabic, and the application of Islamic values in everyday life. Thus, Rumah Tahfidz Al-Inayah is determined to continue working so that every indicator of program success is achieved within the specified period.

3.2 Discussion

This research reveals several important aspects to consider when developing a Rumah Tahfidz Al-Inayah Pamulang application system. First of all, from the results of this research, the operational flow of the application is well-designed to meet the needs of users or admins in accessing, managing, and reporting student, teacher, and halaqah data. However, it is essential to remember that reliance on an internet connection as a prerequisite for accessing applications can be an obstacle, especially in areas with poor connectivity. This indicates the need to consider alternative solutions or provide offline access to ensure continued system use. SWOT analysis also provides valuable insight into academic information systems development's strengths, weaknesses, opportunities, and threats. The main advantage obtained through this information system is efficiency in data collection and monitoring students' memorization of the Al-Qur'an, which can help increase productivity and quality of education at Rumah Tahfidz Al-Inayah. However, challenges include dependence on technological infrastructure and the risk of disruption in system use.

In addition, the development method chosen, namely the waterfall method, allows for a structured and systematic development process. The stages that have been carried out, from needs analysis to maintenance, reflect a commitment to produce solutions that suit the organization's goals and needs. However, this approach may need more flexibility in accommodating user needs or requests for mid-stream changes. Therefore, it is important to keep user feedback and flexibility in mind in future system development. Furthermore, the impact analysis matrix provides a clear picture of the relationship between organizational needs and their implications for the Information Technology (IT) field. Organizations can identify areas that need attention in developing information systems by identifying business, information, and technology needs. By understanding the impact of each requirement on IT, organizations can make better decisions regarding system development and implementation.

The system functions and features have also been well-designed to meet the organization's operational needs. With halaqah management, KBM/tasmi management, and data recapitulation management, this system

is expected to provide adequate support in the daily operations of Rumah Tahfidz Al-Inayah. Apart from that, the established technical specifications also guarantee the quality and consistency of the system, with the backing of appropriate programming languages, frameworks, and development software. The developed program system design, including diagrams and display of program results, provides a clear picture of the application structure and interface. With flow map diagrams, use case diagrams, activity diagrams, sequence diagrams, and ERDs, understanding the workflow and interactions in the system can be more manageable. In addition, the display of program results also provides a visual representation that is important in understanding the function and user interface.

The results of interviews with Rumah Tahfidz Al-Inayah show a strong vision and goals in developing the tahfidz program. By focusing on achieving the target of memorizing the Qur'an, establishing a community-based religious area, and its role as a center for learning the Qur'an for the community, this organization shows a high commitment to positively contributing to the surrounding community. The success indicators that have been established also provide clear direction for achieving these goals. This research provides a deeper understanding of the challenges, opportunities, and potential solutions in developing an academic information system for Rumah Tahfidz Al-Inayah Pamulang. Considering the results of the analysis and feedback from various related parties, the development of this system can run smoothly and provide significant benefits for the organization and the surrounding community.

4. Related Work

Developing a web-based academic information system at Al-Inayah Pamulang Quran House in South Tangerang is crucial for optimizing efficiency and accuracy in student assessment recording. This endeavor aims to enhance data collection efficiency, monitor memorization progress, preserve resources, and store systematic data. Employing the waterfall model as the proposed methodology, the system progresses through sequential phases: conception, initiation, analysis, design, construction, testing, production/implementation, and maintenance. It aims to facilitate academic information management for students, educators, and stakeholders, incorporating functionalities such as student data recording, activity scheduling, academic progress tracking, and communication with parents or guardians. The system's successful implementation hinges on user acceptance and actionable outcomes, as evidenced by analyzing the acceptance and successful implementation of academic information systems in other institutions.

Moreover, it should align with the organization's structure and cater to its specific requirements. Leveraging RESTful Web Service as a data generator for reporting in the academic information system can bolster its performance. Security considerations are paramount in developing educational information systems using WebAssembly technology. It underscores the significance of maintaining system security during interactions with other devices. Additionally, potential integration with radio frequency identification (RFID) and database-based attendance management systems could enhance its functionality. Developing and implementing the web-based academic information system at Al-Inayah Pamulang Quran House should adhere to the waterfall model methodology, prioritize user acceptance, align with organizational needs, address security concerns, and explore integration possibilities with other technologies to ensure effectiveness and success.

Developing a web-based academic information system at Al-Inayah Pamulang Quran House aligns with findings from various studies. Belluano et al. (2021) stress the importance of employing WebAssembly technology to maintain system security during device interactions, echoing the need for security in academic information systems [21]. Similarly, Amin et al. (2021) advocate using RESTful Web Service as a data generator for reporting academic information, resonating to enhance assessment recording efficiency and accuracy [22]. Furthermore, Ahmad et al. (2021) discuss the successful implementation and testing of a radio frequency identification (RFID) and database-based attendance management system, highlighting RFID integration's potential to augment the academic information system's functionality [23]. These studies collectively contribute to understanding the technological and security aspects of developing the web-based academic information system at Al-Inayah Pamulang Quran House. By harnessing WebAssembly technology, RESTful Web Service, and RFID integration, the system can ensure security, streamline data reporting, and enhance functionality, aligning with its objectives.

5. Conclusion and Recommendations

Creating a website-based academic information system application for Rumah Tahfidz Al Inayah has provided satisfactory results. The project runs smoothly and in line with both parties' expectations, demonstrating successful collaboration between developers and stakeholders. Effective mentoring during the socialization process, supported by colleagues, has met the predetermined schedule and achieved previously agreed success criteria. This program also succeeded in attaining the objectives revealed in the initial interview, with the successful process of data collection and recapitulation of data that had been transferred to the website system. For further development, this project can become a basis for further research in the academic field, allowing researchers to explore the implementation of information systems in educational contexts. With the adoption of a new data processing system, it is recommended that users be active in identifying system deficiencies and weaknesses. This step is vital because it allows early identification of problems that may arise so that appropriate solutions can be implemented for continuous improvement, increasing the effectiveness and efficiency of the system as a whole.

References

- [1] Falmarum, R., Nugraha, A. E., & Winarno, W. (2021). Perancangan Sistem Informasi Sistem Akademik Berbasis Web Pada SMP 2 Klari. *INTECOMS Journal of Information Technology and Computer Science*, 4(2), 141–154. <https://doi.org/10.31539/intecom.s.v4i2.1977>
- [2] Amalia, H., Retnasari, T., & Rachmawati, S. (2020). Pemanfaatan Teknologi Informasi Untuk Meningkatkan Pelayanan Akademik Rumah Tahfidz Dan Tpq Sakinah Cipayung Jakarta Timur. *Jurnal Abdimas BSI: Jurnal Pengabdian Kepada Masyarakat*, 3(2), 228–235. <https://doi.org/10.31294/jabdimas.v3i2.8550>
- [3] Mulyana, D. I., Sugiyono, S., Sutisna, S., Hartanto, H., Saepudin, A., & Malau, F. R. (2022). Implementasi Sistem Informasi Santri Pada Rumah Tahfidz Pejuang Quran Duren Sawit Jakarta Timur Berbasis Web. *Swabumi*, 10(1), 60–65. <https://doi.org/10.31294/swabumi.v10i1.12568>
- [4] Kesuma, C., & Kholifah, D. N. (2019). Sistem Informasi Akademik Berbasis Web Pada Lkp Rejeki Cilacap. *EVOLUSI: Jurnal Ilmiah Sains dan Manajemen*, 7(1), 82–88. <https://doi.org/10.31294/evolusi.v7i1.5026>
- [5] Rahman, T., & Pramastya, A. B. (2019). Perancangan Sistem Informasi Akademik Berbasis Website Pada SMK Bina Medika Jakarta. *JSAI (Journal of Science and Applied Informatics)*, 2(3), 223–229. <https://doi.org/10.36085/jsai.v2i3.460>
- [6] Arinal, V., Mulyana, D. I., & Paryanti, A. B. (2020). Berwirausaha Melalui Desain Grafis Di Pondok Pesantren Darul Muqorrobin Kotamadya Bandung. *SENADA Semangat Nasionalisme dan Demokrasi*, 1(1), 107–112. [Online]. Available: <https://jurnalbima.id/index.php/senada/article/view/16>
- [7] Akbar, Y., et al. (2022). Pembuatan Aplikasi Tajwid Berbasis Web MTs HAUDHIYAH AL-WATHONIYAH 43 Kelurahan Jatinegara. *Jurnal Teknologi Elektro dan Komputer*, 4(2), 130–137. [Online]. Available: <http://jurnal.unmuhjember.ac.id/index.php/ELKOM/article/view/7412>
- [8] Alinur, D. A. P., Lestari, S., Mulyana, D. I., & Saputro, W. (2021). DSS Sistem Pendukung Keputusan Penilaian Kinerja Guru Terbaik pada TK IT AN-NUR Menggunakan Metode Graphic Rating Scales. *J-ICOM: Jurnal Informatika dan Teknologi Komputer*, 2(2), 57–61. <https://doi.org/10.33059/j-icom.v2i2.3990>
- [9] Nurelasari, E. (2020). Perancangan Sistem Informasi Akademik Pada Sekolah Menengah Pertama Berbasis Web. *Komputika: Jurnal Sistem Komputer*, 9(1), 67–73. <https://doi.org/10.34010/komputika.v9i1.2243>

- [10] Rahmadani, T. P., Siswanto, A., & Yani, H. (2022). Perancangan Sistem Informasi Akademik Berbasis Web Pada SMP N 1 Muaro Jambi. *Jurnal Informatika Dan Rekayasa Komputer (JAKAKOM)*, 2(September), 305–314.
- [11] Raharjo, M., Napiah, M., & Anwar, R. S. (2022). Perancangan Sistem Informasi Dengan PHP Dan MYSQL Untuk Pendaftaran Sekolah Di Masa Pandemi. *Computer Science*, 2(1), 50–58. <https://doi.org/10.31294/coscience.v2i1.689>
- [12] Siagian, S. H. T., & Effiyaldi. (2018). Analisis Dan Perancangan Sistem Informasi Akademik Pada Stikes Prima Jambi. *Jurnal Manajemen Sistem Informasi*, 3(4), 1282–1291.
- [13] Saadah, N., Putra, M. A., Mulyana, D. I., Informatika, F. T., & Timur, K. J. (2023). 612-Article Text-3694-1-10-20230123. *Jurnal*, 3(2), 1519–1528.
- [14] Marzuki, Z., & Musril, H. A. (2021). Perancangan Sistem Informasi Akademik Siswa Menggunakan Codeigniter 3 Di Smkn 4 Payakumbuh. *Jurnal Edukasi Elektro*, 5(1), 49–55. <https://doi.org/10.21831/jee.v5i1.37190>
- [15] Tombilayuk, L., & Brilliantama, B. (2022). Perancangan Sistem E-Raport SMP Negeri 7 Bontang Berbasis Website. *Jurnal Teknologi Juara Aktif Global Optimis*, 2(1), 26–39. [Online]. Available: <https://www.sttibontang.ac.id/jurnal/index.php/jago/article/view/56>
- [16] Gunawan, D., Mora, H., Husein, & Hafidzurrahman, A. F. (2023). Implementasi Sistem Informasi Pencatatan Laporan Tahfiz pada Yayasan Majelis Hifzhu Syifaa Cileungsi. *Jurnal Pengabdian Nasional Indonesia*, 4(2), 338–346. <https://doi.org/10.35870/jpni.v4i2.199>
- [17] Firma Sahrul, M. A. S. O. D. W. B. (2017). Implementasi Sistem Informasi Akademik Berbasis Web Menggunakan Framework Laravel. *Jurnal Transform*, 12(1), 1–4.
- [18] Susanti, M. (2016). Perancangan Sistem Informasi Akademik Berbasis Web Pada SMK Pasar Minggu Jakarta. *Informatika*, 3(1), 91–99.
- [19] Mulyana, D. I., Lazuardi, M. F., & Yel, M. B. (2022). Deteksi Bahasa Isyarat Dalam Pengenalan Huruf Hijaiyah Dengan Metode YOLOV5. *Jurnal Teknologi Elektro dan Komputer*, 4(2), 145–151. [Online]. Available: <http://jurnal.unmuhjember.ac.id/index.php/ELKOM/article/view/8145>
- [20] Yel, M. B., Mulyana, D. I., Adhipramana, F., Pratama, F. F., & Prasetyo, O. (2023). Implementasi Aplikasi Learning Management System and Student Attendance pada IDN Academy Berbasis Web. *Jurnal Pengabdian Nasional Indonesia*, 4(2), 284–293. <https://doi.org/10.35870/jpni.v4i2.194>.
- [21] Belluano, P. L. L., Purnawansyah, P., Saiman, L., & Panggabean, B. L. E. (2021). Development of academic information system using WebAssembly technology. *ILKOM Jurnal Ilmiah*, 13(2), 125–133. <https://doi.org/10.33096/ilkom.v13i2.806.125-133>
- [22] Amin, M., Widodo, S., Sutrisman, A., Cofriyanti, E., & Firdaus, A. (2021). Restful web service as data generator for reporting of academic information system. *Atlantis Highlights in Engineering*. <https://doi.org/10.2991/ahe.k.210205.073>
- [23] Ahmad, U., Bisu, A., Umar, F., & Balarabe, U. (2021). Radio frequency identification (RFID) and database-based attendance management system. *Bayero Journal of Pure and Applied Sciences*, 14(1), 120–129. <https://doi.org/10.4314/bajopas.v14i1.16>