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Design of a Web-Based Inter-Madrasah Student Transfer Service Information System

Perancangan Sistem Informasi Layanan Mutasi Siswa Antar Madrasah Berbasis Web

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A B S T R A C T

The Ministry of Religion in Medan City is one of the ministries that has an important role and contribution. Sometimes we find various kinds of problems that need to be balanced by improving the existing system. The system in the Ministry of Religion of Medan City is still manual and seems to require a long process. Based on current conditions, improvements have been made by creating an information system design for Web-based mutation activities. The aim of this research is to create a design for an information system for submitting mutation letters. In this research, the model used is a product of waterfall model software. The research was carried out through a process of direct observation on site, interviews with officers processing transfer applications, then the results will be depicted in the form of a process flow diagram, data flow diagram and afterwards represented. in the form of user interface design. From the results of this research, a user interface design was obtained for the information system for submitting transfer letters at the Medan City Ministry of Religion. With an online system, officers will save more time in processing data, save space in data storage and make it easier to search for transfer student data, which can be used as input or reference material for related parties.

Keyword: information systems, mutations, web-based

A B S T R A K

Kementerian Agama Kota Medan memiliki peran dan kontribusi penting. Namun saat ini berbagai permasalahan masih muncul karena sistem yang berjalan bersifat manual dan memakan waktu lama. Berdasarkan kondisi tersebut, perlu dilakukan perbaikan dengan merancang sistem informasi layanan mutasi siswa antar madrasah berbasis web. Penelitian ini bertujuan menghasilkan desain sistem informasi untuk pengajuan surat mutasi siswa. Metode yang digunakan adalah model waterfall, dimulai dari observasi langsung di lapangan dan wawancara dengan petugas pengelola permohonan mutasi. Hasil pengumpulan data kemudian digambarkan dalam diagram alir proses (flowchart), diagram alir data (DFD), dan prototipe antarmuka pengguna. Dari penelitian ini diperoleh rancangan antarmuka pengguna sistem informasi pengajuan surat mutasi siswa di Kementerian Agama Kota Medan. Dengan sistem daring tersebut, petugas dapat menghemat waktu dalam pengolahan data, mengurangi ruang penyimpanan fisik, serta memudahkan pencarian data mutasi siswa. Sistem ini diharapkan menjadi masukan dan referensi bagi pihak terkait dalam meningkatkan kualitas layanan mutasi siswa.

Kata kunci: sistem informasi, mutasi siswa, berbasis web.

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1. INTRODUCTION

The development of information technology is now increasingly rapid, especially in the digital era like today. If in the past humans communicated verbally, now humans can communicate easily via email, telephone, television, internet, and social media. Almost everyone has used the internet inthe form of a website, so it's a good idea for us to develop a website based on our wishes. user. This development is supported by the availability of increasingly powerful hardware and software, which makes it easier for people to carry out their daily activities[1][2][3][4].

Information technology, especially the internet, is certainly welcomed by all groups. So this creates competitive competition between every educational institution, including educational institutions. This conventional system also results in the administrative process of admitting new students tending to be slow, because the data on new students who have registered has not been integrated and managed well. This system also still uses archives in physical form which are susceptible to damage or even loss[5][6].

The Ministry of Religion in Medan City is one of the ministries that has an important role and contribution in achieving national education development targets in Indonesia. The Ministry of Religion provides formal, non-formal and informal education services. Every growing company sometimes encounters various kinds of problems that need to be balanced by improving the existingsystem. The system in the Medan City Ministry of Religion is still manual and seems to require a long process. With the current problems, the author is interested in creating a web-based applicationto facilitate student transfer system services between madrasas at the Ministry of Religion of MedanCity. Thus, the information needed, both for interacting with the user, verifying data entered by the user, changing the shape of buttons and so on, can be done easily in designing WEB-basedapplications. This is also related to storing data. Data processing and storage are quite complex materials in developing an application. There are many benefits that institutional offices can obtain from using WEB-based application design[7][8][9].

The existence of computers and networks will provide benefits for all humans to help complete their work. In fact, in the world of education, computers have become a mainstay for processingdata in schools. The increasing development of information technology is certainly welcomed by allgroups. So this creates competitive competition between every public and private educationalinstitution[10][11][12].

In general, a website is a collection of various site pages summarized in a domain or subdomain, which is on the WWW (World Wide Web) and of course on the Internet. Website pages are usually documents written in Hyper Text Markup Language (HTML) format [13][14][15].

Web-based information systems have developed rapidly at this time, as can be seen from the widespread use of computers and social media that has hit the entire population in Indonesia, especially in the world of education, which of course requires the role of web-based information systems, one of which is in terms of new student registration. With the increasing growth of students, it is necessary to create a system and work procedures that make it easier for registration officers and prospective students themselves. Therefore, it is felt necessary to raise this problem so that it can be resolved and make it easier to register new students to obtain accurate data. and efficient[16][17][18].

Based on current conditions, improvements were made by creating a design for a human resources information system, especially for mutation activities. The design of the mutation information system was chosen for several reasons, namely the process of collecting information to be timely, concise and accurate. Apart from that, with an information system, the employee transfer and promotion process will become efficient so that it can increase productivity[19].

Mutation is an employment activity related to a transfer process. In the student transfer system, the provision of computers is very important in carrying out its activities, usually the service for making letters of recommendation for transferring schools or transfers is still done manually, sothat many basic errors occur such as lack of guaranteed data security, errors in letter numbering so that it is not effective and efficient because it has to be done. Double check before storing.Implementing student transfers using a computer will make it easier for officers to store them directly into a database, officers can search for the required mutation data quickly. However, the flow of student transfer services is considered to be still convoluted and not transparent, which is an obstacle for parents who want to submit a transfer application letter[20][21].

One of the goals of the service sector is to provide the best service to the community, one of whichis by implementing technology, especially information technology, into the service system considering that advances in information technology can lead people to a faster and more efficient way of working and thinking. A quality school requires the ability to keep up with technological developments and the ability to access and present information so that it can be accounted for in order to improve the quality of education, having a computerized information system that produces accurate data. In educational institutions, this information system aims to assist the process

of managing grades data, student data and teacher data, as well as managing activities in the school[22] [23] [24] [25].

Previous research conducted, the results of this research were to notify registrants that the reference letter had been completed or processed, tell registrants what steps the registrant had to follow, and make it easier to search for registrant files. mutations, the similarity between this researcher and the research made by the author is that they both discuss mutations, and. The difference is that previous research discussed the employee transfer processand the process of ratifying pension decrees, while the author only discussed student transfers between madrasas[26] [27].

The aim of creating this system is so that registrants (students) know the flow of transfer registration, create a database to make it easier to find student registration data and create an information system for student transfer registration at the Madrasah Tsanawiyah (MTS) and Madrasah Aliyah (MA) levels with a web platform. It is hoped that by designing this studenttransfer information system, which the author provides based on this background description, this information system can make it easier for students to be effective (registrants do not need to queue or do not have to wait long to collect reference letters, and file storage can be neater and safer.

2. METHODOLOGY

2.1 Research Phase

In this research, the model used is a product of waterfall model software. The waterfall method is also known as the waterfall method, often referred to as the classic life cycle. This model is actually called the "Linear Sequential Model" and describes a systematic and sequential approach to software, starting with the definition of user requirements. The stages consist of: analysis, design, implementation, verification and testing.

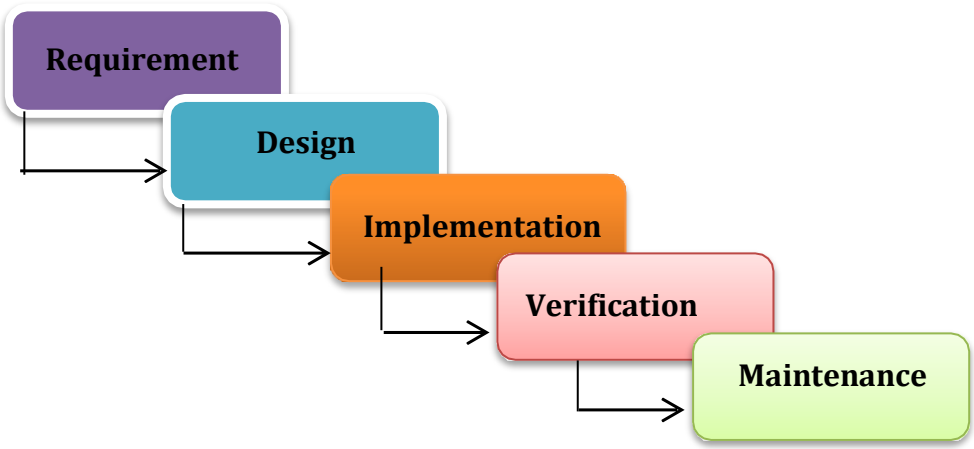

Figure 1 . Waterfall Method

The following are several research stages, namely:

1. Needs Analysis (Requirements)

   At this stage, complete requirements are collected and then analyzed and defined the needs that must be met by the program to be built. This stage was carried out through open interviews with research subjects. The subjects of this research were madrasa students. Apart from students, teachers were also interviewed to obtain system requirements. Apart from interviews, literature studies were also carried outto deepen the researcher's understanding of the theories in this research

2. System Design (Design System).

   After obtaining the required data, at this stage a software design will be carried out according to the needs obtained in the previous stage.

3. Implementation Making program code (Implementation).

   After going through the system and software design stage, the next step is to write the design into program

codes. In this implementation, the Laravel framework and MySQL database are used.

4. System Testing (Verification)

   Carry out system testing so that the system is valid and can be used properly.

5. Maintenance

   Applying an integrated system and carrying out maintenance or repairs if there are deficiencies in the system.

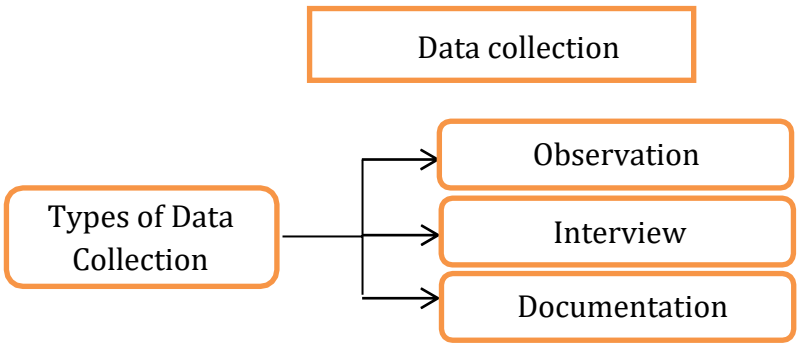

Figure 2. Data Collection

At this stage, the complete requirements are gathered by means of direct observation and then analyzed and defined the needs to be met by the program to be built. This stage is carried out through open interviews with research subjects. The subjects of this study were madrasah students. In addition to students, teachers are also interviewed to obtain system requirements. In addition to interviews, Documentationis carried out to record every step of the research from planning, data collection, analysis, to the final results of the research. By doing documentation, researchers canmaintain the accuracy and reliability of the data collected.

2.2 Analysis Method

1. Observation method (survey)
2. Method of analyzing observation results
3. Information needs analysis method

2.3 Design Method

In designing the writing of this research, the author used the following method:

1. Software design
2. Browsing method.
3. Library study.
4. As well as from various other relevant sources.

3. RESULTS AND DISCUSSION

3.1 Data Collection Results

The results of data collection were carried out through individual interviews with one of thestaff employees in the administration section as a resource:

Tabel 1. Data

No	Question	Answer
1	Does this madrasa have separate requirements for students who want to transfer?	That's right, in this madrasa, if a student who wants to transfer must complete the specified requirements,namely a certificate of transferring schools, a letter requesting a transfer from the parent, a letter requestinga recommendation to move schools to the department, a certificate of having accepted transfer students from the destination school.
2	What is the transfer process for students here who will transfer out?	We still have a manual process, so for students whowant to move out, the student's parents make a request toleave first, that their child will move to another school which will be signed by the head of the madrasah and the religious department, then the school operator makes a certificate of leaving.
3	What factors cause mutations to occur in students, both outgoing and incoming mutations?	What is clear is that many students move because their parents have changed assignments so we can't stop them,the same goes for students who want to transfer because their parents moved from who knows where from another province so we can't refuse, as long as the conditions can be met.
4	Are there any obstacles experienced during the student transfer process?	If there are problems, sometimes it's because we're still manual, so we wait for the signature again. If the principal doesn't come, the students will go back and forth waiting for the letter and the student data also takesa long time to look for it because the manual is only stored in the cupboard so you have to look for it one by one. .

From the interview data, it can be concluded that the process of implementing student transfers is still manual and less effective because it takes time because you have to wait for a letter which must be signed by the school principal. So the process must be improved.

3.2 System Analysis Stage

In designing a system, a system requirements analysis is first carried out as a reference. This isdone with the aim of the resulting system being able to overcome problems experienced by usersand in accordance with user needs. The new web-based student transfer system was built with several access rights, namely the student section as admin and students as users. Students can register online via a web browser, so students do not need to come to school to transfer.

Student Page:

1. Students can see information about the school and its procedures
2. Students can register users
3. Students can log in after registering as a user
4. Students can fill out the registration form after logging in
5. Students can save the completed form

Admin Page:

1. Admin can log in with email and password
2. Admin can manage transfer form data for students.
3. Admin can view registrant data

3.3 Use case diagram

Use casesor use case diagram is a modeling for the behavior of the information system that will be created. Roughly speaking, use cases are used to find out what functions are in an information system and who has the right to use what functions are in an information system and who has the right to use those functions.

The following is a use case diagram of the Madrasah student transfer system:

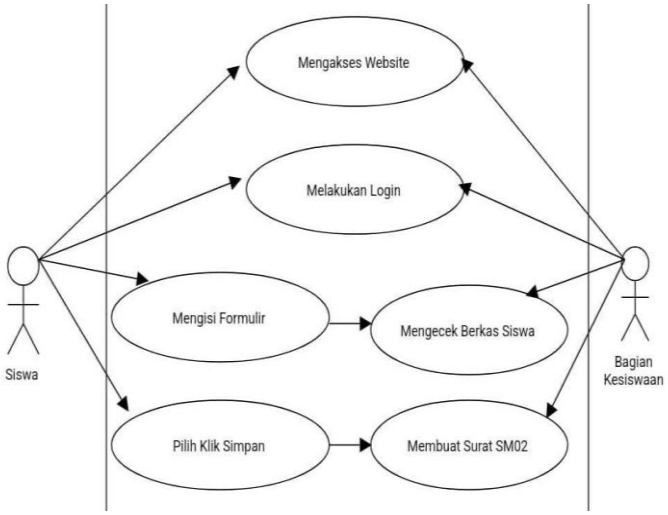

Figure 3 . Use Case Diagram

Where students submit an application to the student affairs department via the website, if the requirements are complete then it is approved by the school principal and then submitted back tothe student affairs department to record transfer data.

3.4 Activity diagrams

Activity diagrams describe the workflow or activities of a system or business process or menu inthe software. What needs to be noted here is that the activity diagram describes system activities,not what actors do, so activities that can be carried out by the system.

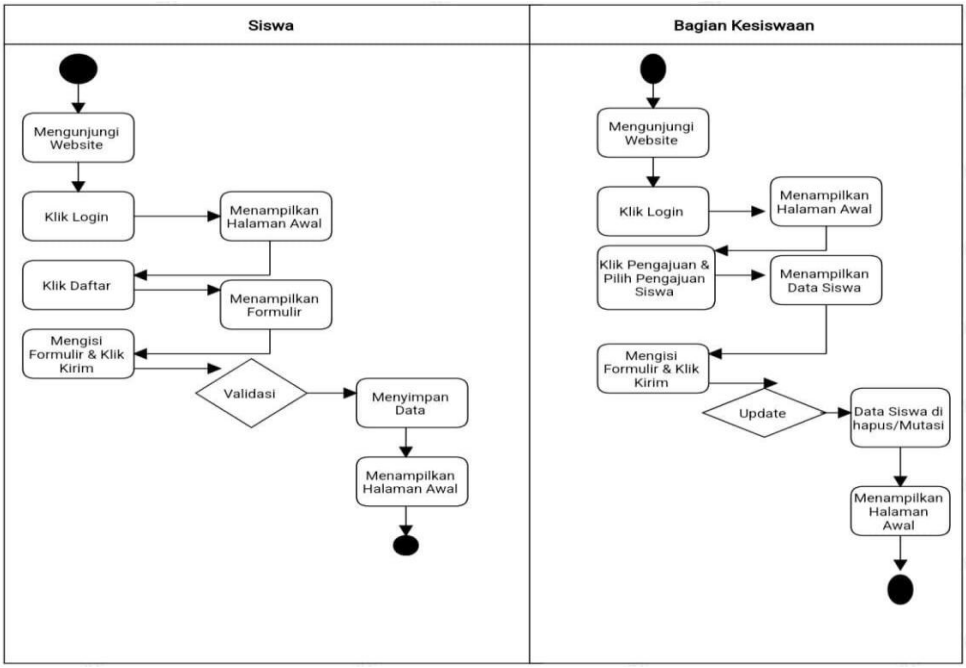

Figure 4. Activity Diagrams

Activity describes the work flow of the student transfer process or activities in the student transfer process, there is an explanation from the picture above, namely, starting from the student visiting the websitehttps://mutamadra.000webhostapp.com/then log in, after successfully logging in the system will display the home page, after that the student clicks on the register menu, then the system will display a form, after that the student fills in the form and clicks send then the systemwill validate and save the data, once finished it will appear back to main page.

The explanation of the image above is, starting from the Admin logging in to the websitehttps://mutamadra.000webhostapp.com/admin/ then the system will display the start page, then the admin clicks on the submission menu and selects the student application then the system will display the data of students who have filled out the application form, after that if the data is checked is complete then the admin will approve, and the system will update and the student data will be deleted for the reason that the mutation is complete, the system will return to the main page.

3.5 Implementation

The implementation stage is the development stage after a plan has previously been made. At thisstage, system coding is carried out.

The following is the user interface or display of the student transfer service page which can be seenbelow.

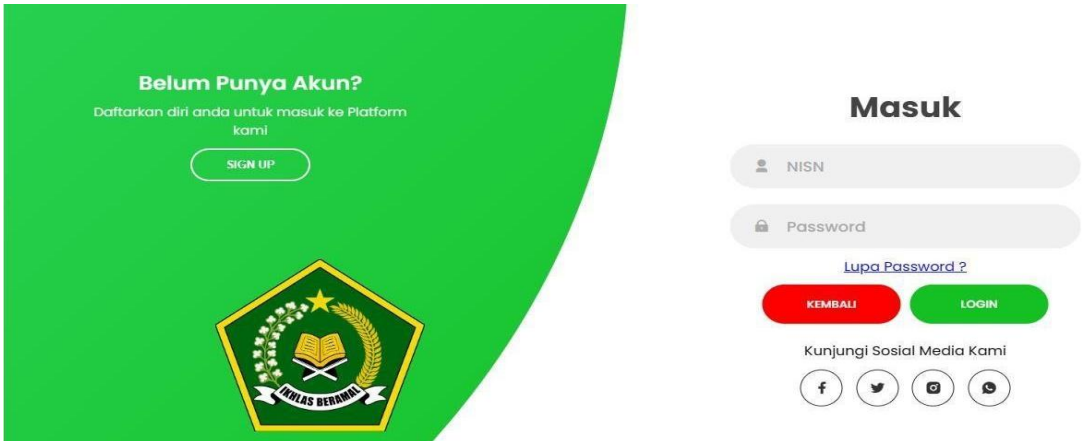

Figure 5. User Start Page (Student)

The home page displays on the website, students register, then log in by entering the NISN andpassword that they have created.

Figure 6. Home Menu

On the home display there is a profile and list menu.

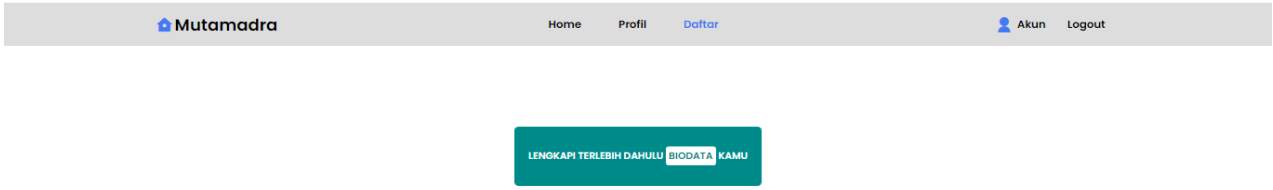

Figure 9. Register Menu

The registration menu displays information to complete the biodata. After filling in the biodata, we will continue filling in the form.

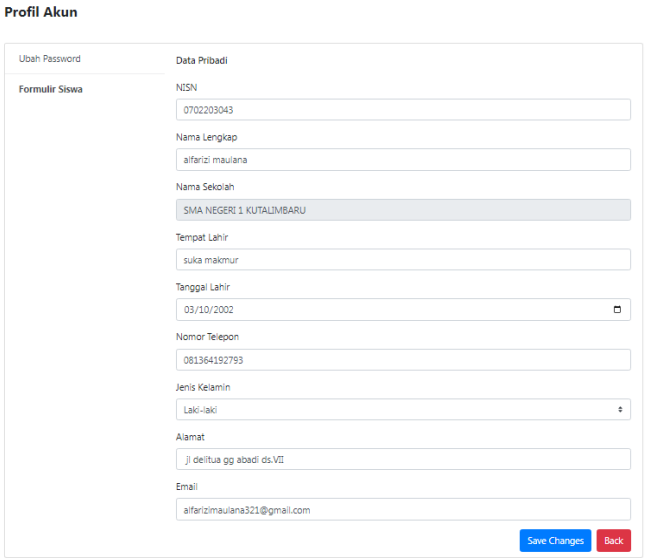

Figure 10. Form Filling Menu

This menu explains how to fill out the form for users who want to submit a mutation process.

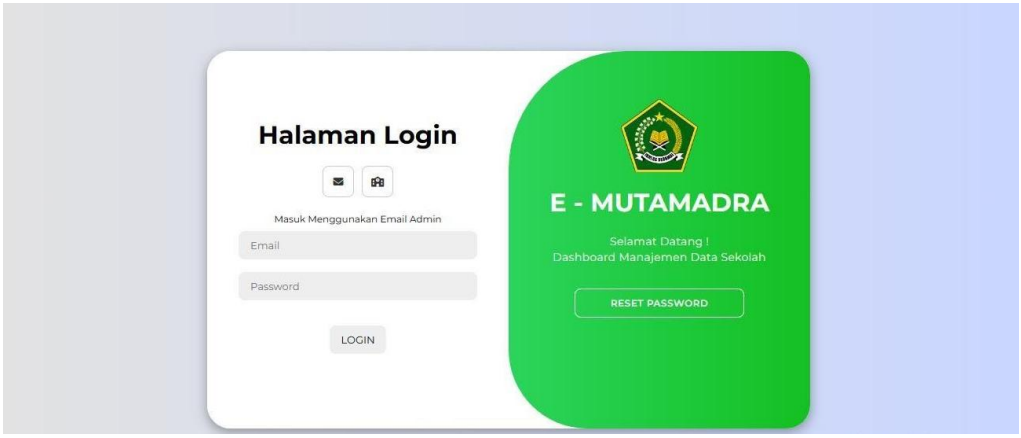

Figure 11. Admin Start Page

Display the Home Page on the website, Admin logs in by entering the existing Email and Password.

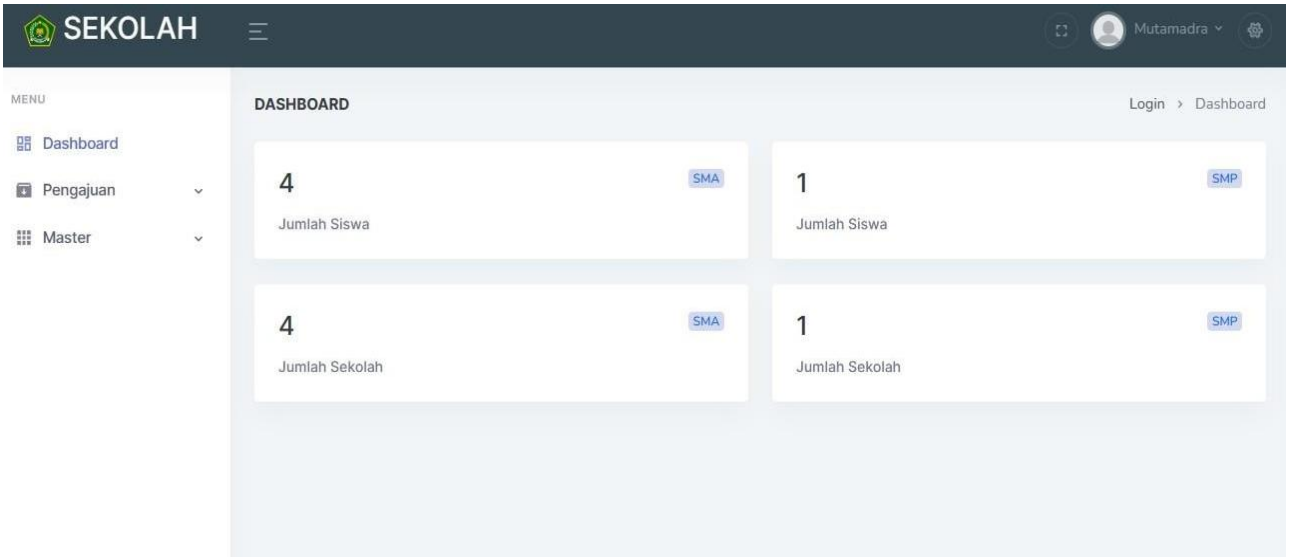

Figure 12. Home Admin Menu

In this home menu, the admin can see student data that has been filled in via the transfer form, andthe destination school of the student who transferred.

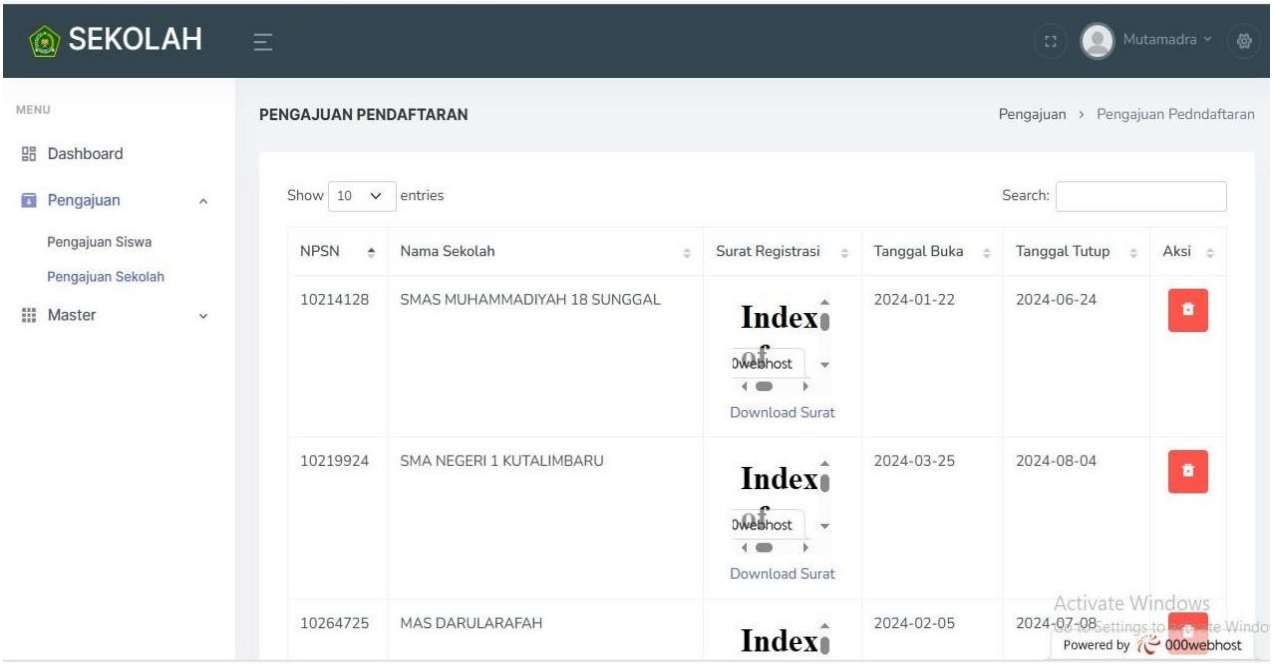

Figure 13. School Submission Menu

On the school application menu, admins can download letters that have been published.

3.6 Cases and Test Results

The following are the results of functional testing of the application:

Table 2. Admin Login Test

Input Data	Which areexpected	Observation	Conclusion
Fill in Login data	If the login data is valid, the admin willenter the system administrator	Login data is valid	Accepted

Table 3. Tests for Managing Admin Page Data

Testing Scenarios	Expected results	Observation	Information
Fill in completely the transfer student's data on the transfer form	If the data entered is complete and correct,the system will process the data to bestored	The data entered is complete and correct, the system processes the data to be stored	Succeed
View student and school data lists	The data displayed is alist of student names and a list of school names	Displays a list of student names and school names	Succeed

Table 4. Student Login Testing

Input Data	Which are expected	Observation	Conclusion
Fill in Login data	If the login data is valid, the student willenter the system home page	Login data is valid	Accepted

Tabel 5. Tests for Managing Shiva Page Data

Testing Scenarios	Expected results	Observation	Information
Completely fill in the registrationdata on the student form	If the data entered is complete and correct,the system will process the data to bestored	The data entered is complete and correct, the system processes the data to be stored	Succeed

The interviews revealed that transfer requirements at this madrasah include a school transfer certificate, a parental request letter, a departmental recommendation and an acceptance letter from the destination school. Because the process remains manual, parents must wait for the headmaster's signature while staff spend time searching unstructured archive cabinets, leading to delays and misfiling as documented by Damanik and Sarumaha in their study of the Telukdalam Subdistrict Office [5].

Analysis of system requirements identified two primary user roles: students register for transfers online and administrators manage and verify those registrations. This web based approach follows best practices in educational data management by reducing administrative workload and accelerating processing times through an accessible online interface [22]. Use case and activity diagrams were created to model the workflow in detail, ensuring that each validation and storage step could be automated with clarity similar to that achieved by Hariyanto and Hardinata in their UML driven development of an electronic archive system [6].

Functional testing confirmed that all core features such as login, registration submission, admin approval and transfer letter download operate correctly under both valid and invalid input conditions. These positive results mirror the 100 percent success rate reported by Suminten et al. when testing a comparable web based transfer module at STAI Muhammadiyah [17]. The implemented system effectively streamlines the student transfer process and improves both data accuracy and security.

4. CONCLUSION

Based on the results of this research, it can be concluded that the design of a web-based inter- madrasa student transfer service information system at the Medan City Ministry of Religion Office was carried out using the waterfall development method. This system aims to facilitate the student transfer process by utilizing information technology. Various diagrams such as use case diagrams and activity diagrams are used to describe workflows and interactions between users and systems. Apart from that, the article also discusses the importance of using information technology in the world of education and the benefits of designing web-based applications. Comparison between previous researchNadya Indi Rahesti, entitled, "Information System for Class Distribution and Student Transfers at Junior High School Level". That is, in my research it only displays a form for filling out students who wish to transfer, whereas in previous research there was a feature for managing National Examination class requests.

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