Design and Development of 'SIASTRA': a Letter Administration Services Application for Students of the Faculty of Medicine, State University of Surabaya

Puput Ayu Ramadhani[1*], Eko Sugiharto[1], Muhaiyinatun Masturo[1], Anugrahani Sabillia Noor Pratama[1], Muhammad Zaki Jauhar Fanani[1], Supriyadi[1]

[1]State University of Surabaya
puputramadhani@unesa.ac.id

Abstract. Letter administration services in an institution are crucial activities that often require a significant amount of time due to the involvement of many stages and human resources. The rapid advancement of information technology increasingly facilitates human work. The existence of a web-based application for letter administration services can greatly assist in streamlining administrative activities. Administrative services in the Faculty of Medicine, State University of Surabaya is still carried out in manually way. For students, who require various types of letters for different purposes, the introduction of SIASTRA (Letter Administration Services Information System) will be highly beneficial. This application will also accelerate the performance of academic and student services staff as administrators. SIASTRA will streamline the letter processing and minimize the use of resources, both human (staff) and materials (such as paper, printers, etc.). The input on the SIASTRA application is the request from students, which is it received by the administrator (academic and student services staff) for processing and giving the digital signing by the dean. The output of the SIASTRA application is an electronic letter (e-letter) that can be downloaded by students and printed if needed.

Keywords: SIASTRA, Letter Administration Services, E-Letter

1 Introduction

The advancement of digital technology has significantly transformed the world, including the field of education. Increased efficiency, reduced time and effort, and ease of collaboration and integration have made digital technology a primary necessity in the education sector. The massive development of digital technology further facilitates human tasks, including administrative letter services at the Faculty of Medicine, State University of Surabaya.

Based on observations made at the Faculty of Medicine, State University of Surabaya, letter administration services are still carried out manually. Manual administrative services are considered less effective and efficient in terms of letter usage, distribution, and time consumption. To address these issues, an online web-based system is needed that allows students to access services from anywhere and at any time.

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This research aims to design and develop an application for the Letter Administration Services Information System, or "SIASTRA" as a service application for administrative correspondence for students of the Faculty of Medicine, State University of Surabaya. This application will accelerate the process of managing and creating letters for students in need. SIASTRA will shorten the time required for processing letters and minimize the use of resources, both human (staff) and tools (paper, printers, etc.). The input for the SIASTRA application consists of requests from students, which are then received by the administrator (academic and student affairs staff) for further processing and digital signing by the dean. The output of the SIASTRA application is an electronic letter (e-letter) that can be downloaded by students and printed if needed.

The urgency of the construction of this correspondence administration service information system application is to speed up and streamline the time of managing correspondence at the Faculty of Medicine, State University of Surabaya. As known, the management of letters carried out by students is still manual by meeting the faculty academic admin. This is considered less effective because it will cause queues in the academic room, where the Faculty of Medicine academic room is so small. Therefore, the SIASTRA application will greatly assist students and staff in processing letters of correspondence because it can be done online anywhere and anytime.

The Letter Administration Services Information System (SIASTRA) is a website-based or online letter administration service application that is used to accelerate the process of processing and creating letters for students. The method of using the Letter Administration Services Information System (SIASTRA) involves the following steps:

a. Input Process, students conduct the letter submission process by logging in to SIASTRA and filling in the required data.
b. Request process, officers or administrators receive requests, then carry out the process of making letters to then request approval for digital letter signing by the dean.
c. Output process, e-letter that is accessed and downloaded by students anytime and anywhere.

The advantages of using the SIASTRA application are easier to access, increased of time efficiency in the process of processing letters and minimizing the use of resources both human (staff) and tools (paper, printers, and etc.), as well as time flexibility. The output of the application is an electronic letter (e-letter) that can be downloaded by students and printed if needed. Another advantage of using the SIASTRA application is to simplify the process and management of letter archiving. Digitalization of administrative services will make administrative arrangements better and has an unlimited storage database.

Similar research was also conducted by Manisa, et.al on website-based mail applications which showed that the use of website-based mail applications increases efficiency, reduces time and effort, uses mail standards, facilitates collaboration and integration, and reduces costs [1]. Automation and digitization systems allow all processes to be carried out quickly and easily. Students can access and apply for letters from anywhere and anytime so the process is more effective and efficient [2]. Research conducted by Hoke, et.al on the development of application-based electronic mail as an outgoing letter from the Hospital for medical students who run the internship showed a

positive response [3]. The development of the e-letter application is considered an important feature because it allows faster and safer transfer of information between health care providers [4].

Website-based mail administration services or e-letters are designed to meet the needs of students in the mail management process, increase effectiveness and accelerate the process of staff in digital administration [5]. E-letter services also facilitate the process of administration and archives management properly [6]. The use of e-letter applications can reduce time and costs because the output produced is a soft file that can be downloaded directly by students [7].

The application of SIASTRA is a website-based electronic letters (e-letter) system to accelerate the process of processing and writing letters for students in need. The process starts when students log in and input the required correspondence administration service data. This process can be done anywhere and anytime, so students not need to come to the office [8]. Then, academic and student affairs staff as administrators will receive the request digitally, and then the letter will be processed and digitally signed by the dean. Electronic signatures are made because it is easy and can be done anywhere. The use of electronic signatures can increase the effectiveness and accelerate the bureaucracy digitally [9]. This process is very effective and efficient as well as saving the time compared to the manual letter administration service system which often takes a long time because it must be done in many steps and involves many human resources [10]. Students will be able to monitor the progress of letter requests in real time from SIASTRA. After the process of digitally signing the letter by the leader is complete, the output is a soft file of the letter or e-letter that can be downloaded by students and printed if needed [11]

Currently, the letter administration service process at the Faculty of Medicine, Surabaya State University is still using a manual system. Students who require administrative letters such as active university student statements, research permits, internship permits and more, should come to the office to request a letter from the administrative and academic services division. Then, the staff will arrange the letter. The process of making and issuing letters will take a long time if it is related to many parties and university bureaucracy, because signatures are still conducted manually and face-to-face. The mechanism of submitting letters with a manual system must be abandoned and switched to a digital system that makes it easier, increases effectiveness and efficiency, and saves time, energy, and costs [12].

The purpose of this study is design and build a correspondence administration service application for students (SIASTRA) as an administration system that is flexible in space and time at the Faculty of Medicine UNESA. So, the expectations of this research to improve the quality of academic and non-academic services for students of the Faculty of Medicine UNESA.

2 Methods

The method for designing this letter administration service application (SIASTRA) is waterfall model. The sequential software development process is known as the waterfall

model, where progress is regarded as continuously flowing downward through the planning, modeling, implementation (construction) and testing phases [13]. This software development model was introduced by Winston Royce in the seventies who adapted from hardware development. Based on Pressman, the development model of waterfall is a systematic classic model [14]. The waterfall model's benefit lies in its structured, unchanging, and easily applicable stages of the process. Products with clear needs at the outset are suitable for this, so there will be minimal errors. Besides that, good quality software is developed with this method [8]. The waterfall method for system development used as follows.

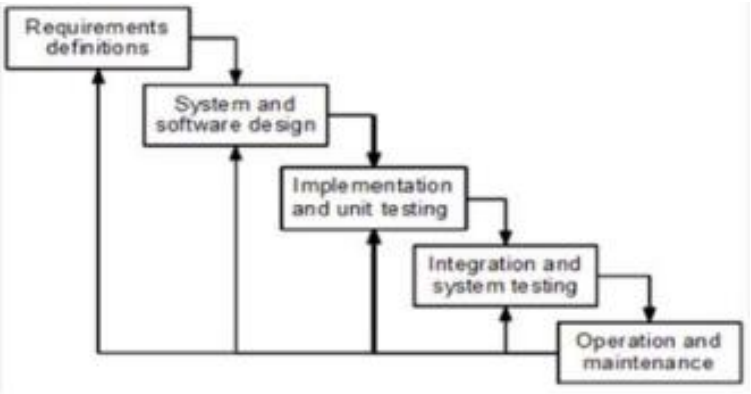

Fig. 1. Waterfall model

The following outlines the process of system development in this study.

2.1 Needs analysis

First stage is analyzing the needs of the system. A lot of information is needed to suit the purpose. Literature studies and observations were carried out to collect data for the implementation of letter administration services for students at the Faculty of Medicine, Surabaya State University. Information regarding system requirements specifications is obtained from information that has been collected, processed, and analyzed. The reference for designing and building SASTRA as a letter application is based on the previously generated user specifications document.

2.2 System design

The second phase is based on the outcomes of assessing system requirements. A comprehensive picture of the things that must be accomplished is the goal of system design. System developers can use it to prepare hardware for the overall software system architecture. Data flow diagrams, entity relationship diagrams, data structures, and discussions are some of the system modeling tools employed. The system development process is more orderly and organized with the help of system design. An overview of how the business logic included in the analysis will be applied technically is also presented here.

2.3 Program code writing

This stage is performed program writing Based on the established system layout. In this research using the waterfall method.

2.4 System testing

Testing the system to check whether or not the system runs well and functions as expected. The system's capabilities and effectiveness will be tested to determine system deficiencies and weaknesses which can then be reviewed to improve the system to make it better.

2.5 Implementation and maintenance

System implementation can be carried out after testing and the system has passed the test. During system implementation, it is necessary to maintain the system to remain usable.

2.6 Continuous Improvement

SIASTRA needs to be continuously improved as needs and technology change. Consider adding new features, fixing issues, and improving user experience all the time.

2.7 Results Evaluation

Evaluation of the results achieved through SIASTRA App. Measuring success based on established goals and data on usage. Based on this evaluation, SIASTRA needs to be further customized.

3 Results and Discussion

Based on the observation in the Faculty of Medicine, State University of Surabaya, the letter administrative services still carried out manually. Therefore, the students need a tool to assist their administrative needs especially about letters. The SIASTRA application is suitable for the students, as they able to use the online application. Students in the Faculty of Medicine should be work in fast movement and neat time. SIASTRA application can be used online, so they do not need to facing the academic staff in room. Designing a Letter Administration Service Information System (SIASTRA) for students at the Faculty of Medicine UNESA consists of several steps, such as:

3.1 Preliminary study

Questionnaires and interviews were used to analyze the system requirements. Some of the system requirements have been obtained at this point, as shown in Table 1.

Table 1. SIASTRA FK UNESA Application Requirements

No	Requirements	Description
1	Online Letter	Letters are accessible online, reducing paper usage
2	Online Application Letter	Application letters are available online and can be accessed anywhere
3	Letter Type	The Selection of Letter Types is available online and accessible anywhere
4	Letter Validation	Letter validation is faster
5	Letter Issuance	Letter processing is faster
6	Letter Archive	Letters stored in database

3.2 Development

Based on the needs of students, the letter administration information system application was made. Before, it is necessary to understand the flowchart of utilizing the SIASTRA application according to Figure 2.

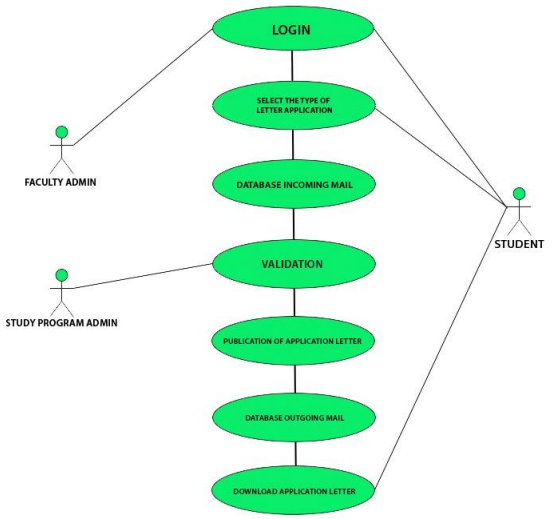

Fig. 2. Use Case Diagram

The application is accessible through the page http://siastra-fk-unesa.my.id/. The initial page display for logging in is shown in Figure 3.

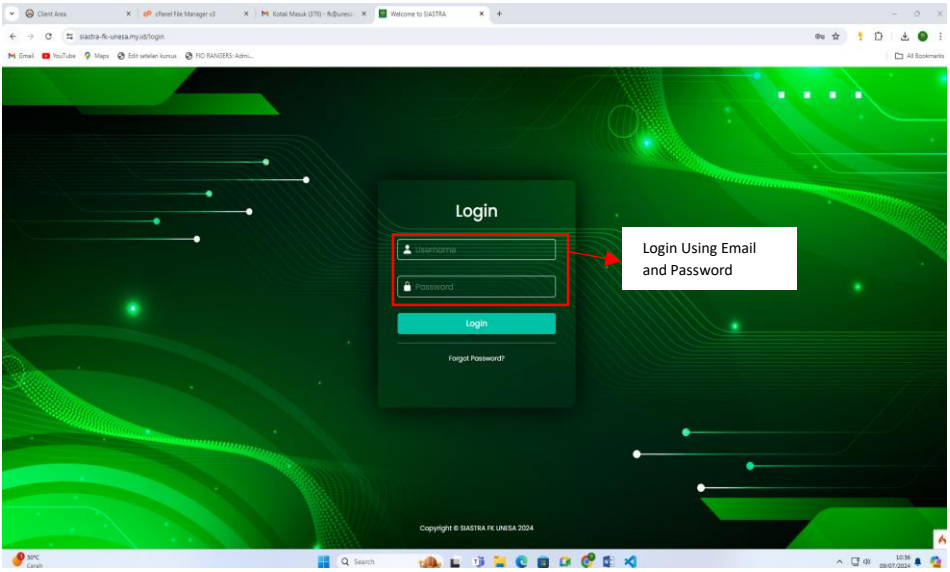

Fig. 3. Login Page

System development according to the results of the needs analysis written in Table 1.

Dashboard. The main display is used by the user, but the difference is the type of use, which is the admin menu and the student user menu. After login, the admin can see the dashboard display as shown in Figure 4.

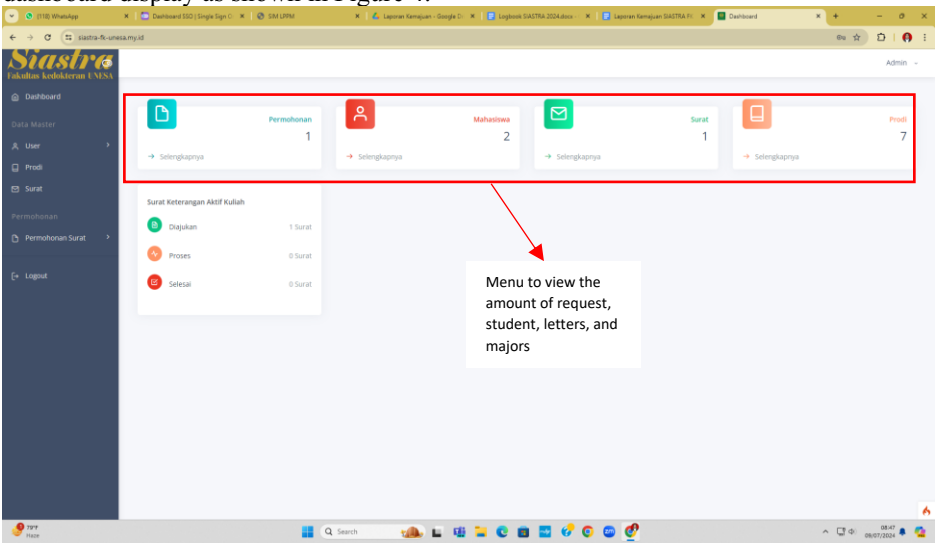

Fig. 4. Admin display menu (dashboard)

User menu. Admins are able to add more user accounts to the SIASTRA application through the "User" menu. As shown in Figure 5, click the "User" menu and two options will appear, which are admin and student. The User>Admin menu is for viewing and adding admin user accounts, while the User>Student menu is for viewing registered student user accounts and adding new student user accounts. The display is shown in Figure 5.

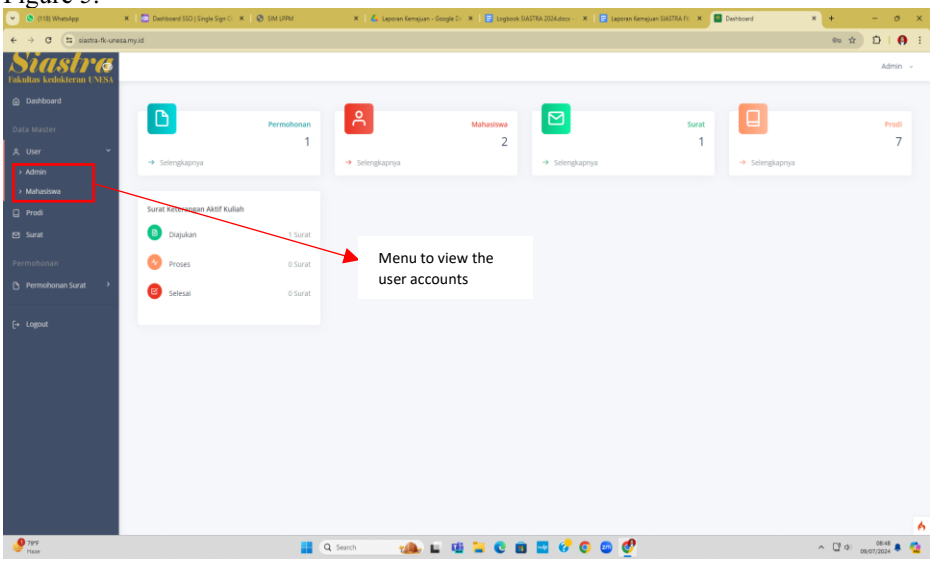

Fig. 5. User menu

Add Admin User Menu. The Admin User menu is for registering a new account and displaying a list of admin accounts registered in SIASTRA. The information includes staff name, email, status, and menu. The menu is for the admin to edit information and/or delete accounts. Admins are also able to add new admin accounts by clicking the "Add Admin" button as shown in Figure 6.

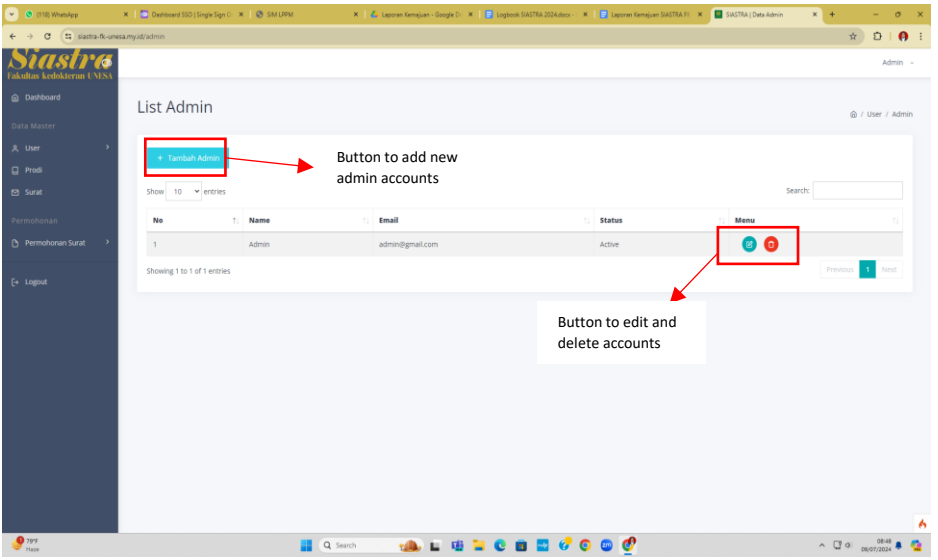

Fig. 6. Add Admin User Menu

Add Student User Menu. Similar to the User>Admin menu, admins are also able to add student accounts in the User>Student menu. The information contained is the student's name, student ID number (NIM), major, e-mail, status, and edit and/or delete account menu for the admin. More details are shown in Figure 7.

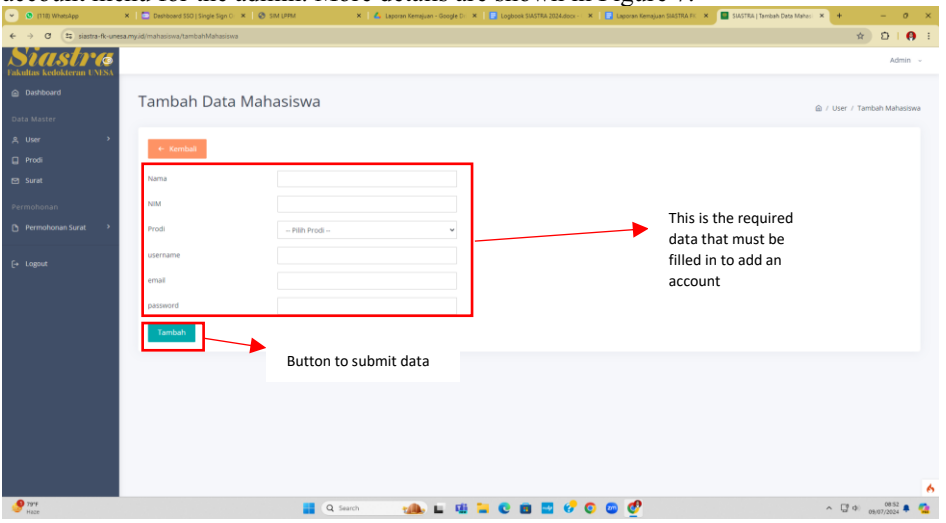

Fig. 7. Add Student User Menu

Import User Menu. This menu is used to import user data according to the format downloaded in the SIASTRA application to accelerate new user registration in the Faculty of Medicine UNESA SIASTRA application, as shown in Figure 8.

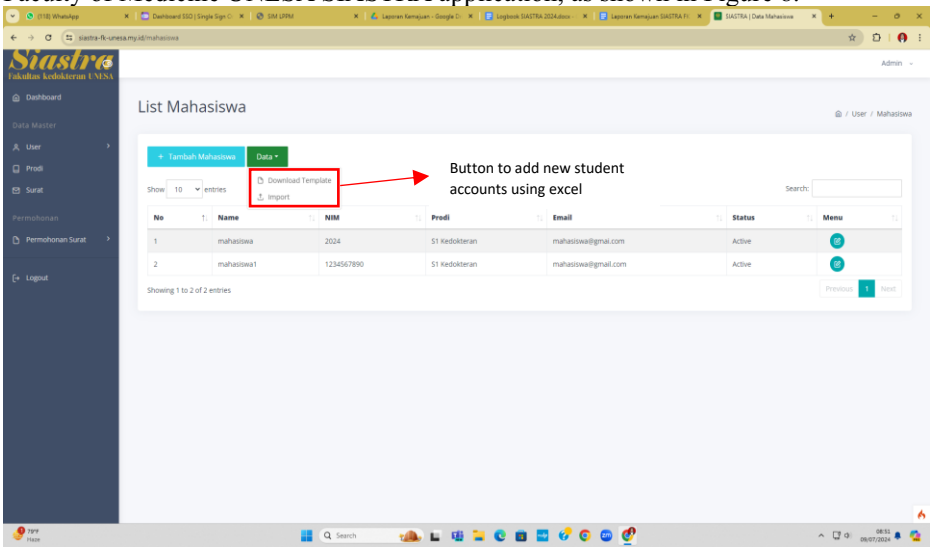

Fig. 8. Import User Menu

Application Letter Menu. This menu is used for submitting active universities student letter which can only be accessed by admin and students as shown in Figure 9.

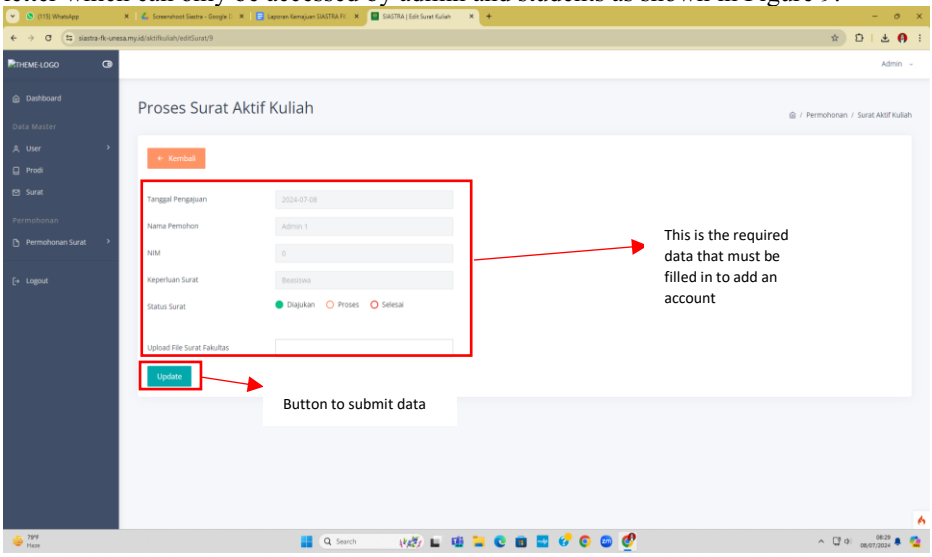

Fig. 9. Application Letter Menu

Logout Menu. This menu is used to exit the SIASTRA Faculty of Medicine Unesa application. When the student has finished applying for a letter and downloading the letter file, and there is no other activity, the student user may log out of the SIASTRA application. The way to log out of the SIASTRA application is the same as logging out for admin accounts, which is by clicking the "Logout" menu. A pop up will appear containing the question "Are you sure you want to leave the application?", the student user can select "Yes" to exit the application or "Cancel" to remain on the SIASTRA application page, as shown in Figure 10.

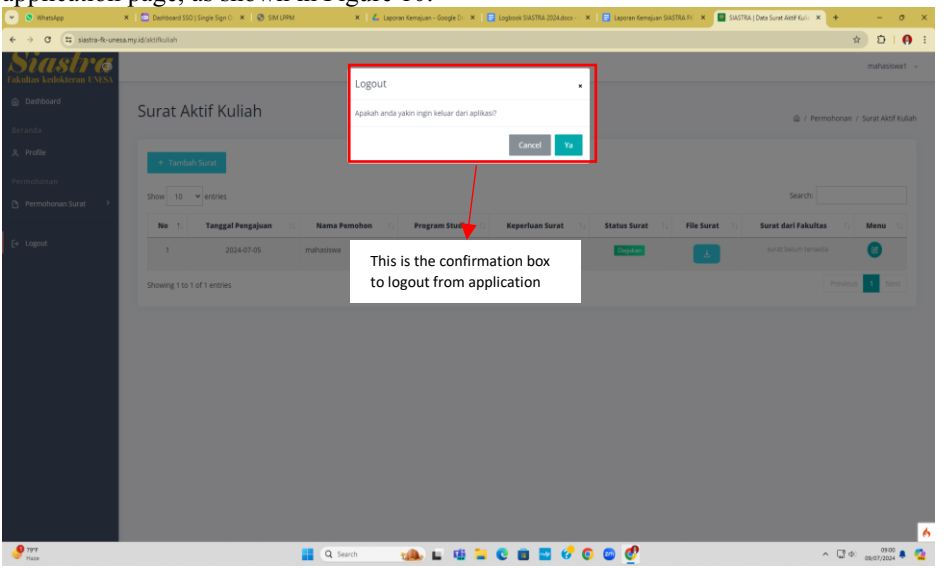

Fig. 10. Logout Menu

3.3 Testing

This step is conducted to test whether the information system is running in accordance with its function. Each menu that has been developed is tested. Table 2 contains the test results.

Table 2. System test results

No	Requirements	Menu Name	Results
1	Online Letter	Siastra	Success
2	Main Page	Dashboard	Success
3	Data Master	Data Master	Success
4	Online User	User	Success
5	List/Type of Letter	Letter List	Success
6	Online Application Letter	Application Letter	Success
7	Letter Validation	Status	Success
8	Letter Issuance	Letter List, Letter Download	Success
9	Letter Archive	Letter List	Success

4 Conclusions

Letter Administration Service Information System (SIASTRA) FK UNESA is designed, built, and able to run and work according to needs. SIASTRA providing letter needs for FK UNESA students. SIASTRA as a tool to enhance effective and efficient services, and it is important to conduct periodic evaluations to users and improve the system based on evaluation. The advantages of using SIASTRA application are minimizing the use of resources (both human and tools), it can be done online (easy to access anytime and anywhere), flexible, easy to archives, and has e-letter output.

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