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Implementation of E-Archives at the Faculty of Communication and Information Technology Using the Web-Based Waterfall Method

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ABSTRACT

Information technology is currently developing rapidly so that every aspect of activity cannot be separated from the name technology, of course in the administrative aspect it also really requires fast and accurate information technology. At the Faculty of Communication and Information Technology, National University, currently still using an archive system that has not been developed again, which often causes data synchronization. With the E-Archives application, it is hoped that archiving activities can assist administrative activities accurately so that it can become a reference in making the right decisions

1. Introduction

Technology is currently developing very rapidly so that it encourages every agency to keep abreast of developments in this technology, especially in managing the information data they have to be accurate and efficient. Of course, this technological development is also very much needed in managing administrative data for every running agency, especially those in the Faculty of Communication and Information Technology, National University. By having a large number of data records, of course, it must be managed in a storage system, one of which is an archive.

Archives are activities in written or oral form that have useful value, of course this archive must be supported by an accurate and fast system to avoid unstructured data accumulation [2], often this is not considered so important that it causes unsystematic archive management in assisting administrative activities. In addition, archives have several criteria that must be fulfilled in their use, such as implementing an archive arrangement system, standards for maintaining and securing archives, procedures for creating archives and archival destruction, and there is an archive officer.

Of course, if this archive is not managed properly, it will greatly impact the ineffectiveness and efficiency of an institution or agency at work. Based on the results of the review by the author, the archives that have been applied only have variables of incoming and outgoing mail, so that to manage data, other information must be sent manually using either paper or electronic email, which this activity is not effectively applied, especially in the current era all of which are based on technology systems.

The archive system, which has been known so far, is only limited to facilitating the entry and issuance of letters and minutes, of course, cannot make it easier to make decisions on a targeted program. The E-Archive system that the author made, is expected not only to facilitate the management of data archives, but also to facilitate administrative work, especially for the Head of the Study Program in making decisions. This system will later consist of several variables, namely incoming letters, outgoing letters, CV (Curricullum Vitae), history of community service, teaching history, educational history, and teaching schedule.

Based on the background that the author has explained, in this study implementing an e-archive system using the web-based waterfall method to easily manage good administrative information, the waterfall method or often called a waterfall is a method in system development carried out to make updates. running [1].

Several research journals are used as references. The author refers to research journals that can be concluded to determine the systematic process of managing records and knowing each variable used and adding some missing variables in the development process [5]. In the next journal, the research conducted is more focused on the system requirements used, which can be concluded that the E-archive system can help alleviate the work of administrative staff because of the complete needs of this archive which leads to all

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variables used, both existing and non-existent [3] . In the next research journal, it is about applications that will be used to utilize the MySQL database for data storage [4].

2. Study of literature

2.1 Research Review

This research review is obtained from references to research that has been done in the past. Here the authors attach some of the results of the research that has been carried out including:

The first research conducted by Romindo and Novia Ameylia in 2019 was about "Archiving Information Systems at Notary Offices Using the Waterfall Method." This stage the authors concluded that the implementation of the archives must be structured using the waterfall method. So that later the stored data can avoid data redundancy

The second research was carried out by Sarwiningsih in 2018 concerning "Analysis of Archive Management in the Secretariat at the Tourism Office." At this stage the authors get a way of collecting data and analyzing what types of records will be collected and managed later.

The third research was conducted by Tirsa Ninia Lina in 2020 regarding "Web-Based E-Archive Information System". In this study the authors can conclude related hardware and software that will be used, and of course can minimize expenditure on hardware which will later be used in making the server. .

The fourth research was carried out by Reni Aryani in 2019 regarding "Implementation of Archives Management Information Systems". In this research the author can conclude about good archive management which later archives can not only be a storage area, but can also be used as a reference to support a decision.

The fifth research was conducted by Fajar Nyfantoro in 2019 concerning "The Development of Electronic Archives Management in Indonesia". In this study the author can assess what kind of archives are active and inactive archives to avoid accumulation of archives whose use value or useful life has expired and is no longer used. needed again.

The sixth study was conducted by Lolytasari in 2015 on "Depreciation of Higher Education Archives in Efforts to Save Archives". In this study, the authors obtained a legal basic reference that must be used in assessing and checking the validity of archives which later can also be used as a reference for a decision. for the Faculty in the future

The seventh research was carried out by Domas Rifan Pambudi in 2018 concerning "Archiving Study Program Documents". In this study the authors obtained a reference for more complex work for secretariats and archivists who will be very instrumental in selecting active and inactive archives later.

The eighth research was carried out by Dinda Widy Pratiwi in 2018 concerning "Study of the Implementation and Depreciation of Archives" In this study it is more dominant with physical archives but the methods and methods that are carried out can be implemented into a complex system to facilitate administrative work at the Faculty later.

The ninth research was carried out by Geovanne Farell in 2018 regarding "Design of a Correspondence Archiving Information System". In this study the authors conclude the cycle or path of the application that will be managed, and also get a reference for application design that will be used so that later it is easy to understand and without training that's so deep.

The tenth research conducted by Muhammad Dedi Kurniawan in 2018 concerning "Implementation of E-Archives in the Informatics Engineering Study Program" in this study is not far from the title that the author adopted so that it can be used as a reference as a flow of management processes in the faculty.

3. Research methods

3.1 files

Archives are records that function as memories in an institution. The existence of this archive has the purpose of gathering information and facilitating retrieval. So archives have an important role in an institution, namely as one type of information source. This makes the archive can be used as evidence in making decisions appropriately. In order for all of that to run properly, it requires an archival processing system that can facilitate management and storage. [5]

3.2 Waterfall

The Waterfall method is a software development method that allows system building to be carried out in a structured and systematic manner (sequentially) according to the existing development cycle. This method is called waterfall or waterfall because in the process, the system will be made sequential step by step

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In the system development method, the author uses the waterfall method. The author chooses the waterfall method because the steps for making a system are orderly and measurable.

This waterfall method has stages as below:

a. Needs Analysis

In this stage, the writer analyzes each variable that is currently in use and which does not exist yet, and the results obtained will be used as a reference as the definition of the system to be applied.

b. System planning

At this stage the author will collect data that must be fulfilled, both hardware and software, and the author also lists the architecture of the entire system.

c. Implementation

This stage the writer will apply all the results that have been obtained from the previous stage into an application program.

d. Testing (Testing)

This stage the program unit is tested and combined and verified to test whether it matches the needs previously collected.

3.3 System planning

In this study, the system design uses an Activity Diagram which briefly describes each menu of each user who plays a role, which the authors describe as follows:

a. Lecturer

In this application, lecturers are required to input their personal data such as CV, teaching history, education history, history of community service. In addition, lecturers can also send and receive letters or information to the Head of Study Program in the form of official information such as activity reports, teaching schedules, and others.

b. Head of Study Program

In this application later the Head of Study Program can easily make decisions for the Faculty, not only decisions in receiving information on incoming, outgoing and validating lecturers' teaching schedules, but Karodi can also consider community service programs, as well as seminars that will be held so that each event agenda will be right on target through archive data that has been stored in the database.

c. Secretariat

In this application, the Secretariat section can easily compile every report it receives from both the lecturer, the Head of Study Program, and also from the campus where the data will be managed into short and clear information to be given to every aspect related to the Faculty of Communication Technology and National University Informatics

3.4 Activity Diagram

Activity diagram in short is a diagram that clarifies each user activity in a system to be created. The author concludes that there will be 3 users in it, namely the Lecturer, Secretariat and Head of Study Program. The following is the Activity Diagram

a. Lecturer

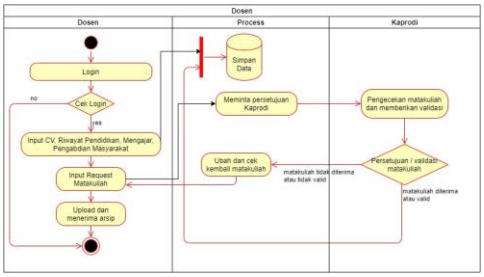

Fig 1. *Lecturer Activity Diagrams*

b. Secretariat

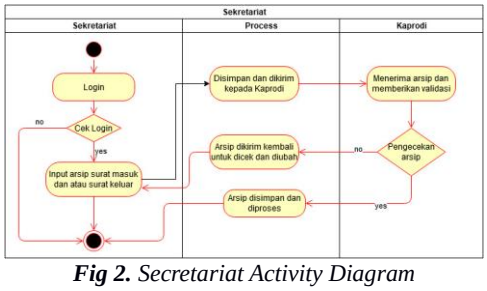

Fig 2. *Secretariat Activity Diagram*

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c. Head of Study Program

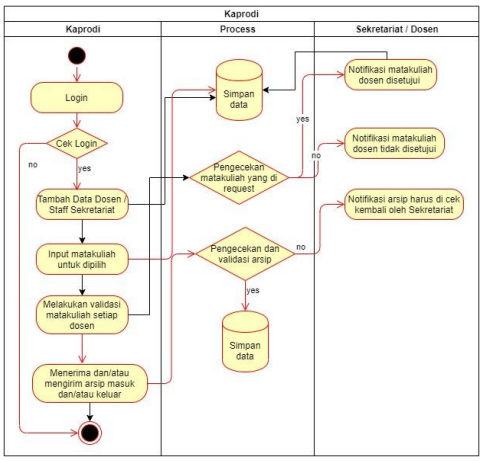

Fig 3. *Head of Study Program Activity Diagram*

4. Results and Discussion

4.1 System Implementation

a. Database

The implementation of the database in this system uses the MySQL database with the database name "siarsip" with a scheme as below

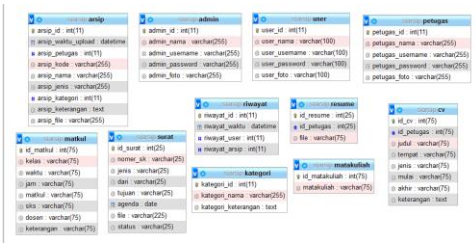

Fig 4 *Database*

b. Interface or interface

On the interface side, the author uses the Boostrap framework template, this page will also be different and divided into 3 views, namely for the Secretariat, Lecturers, and Head of Study Program

1) Main interface display

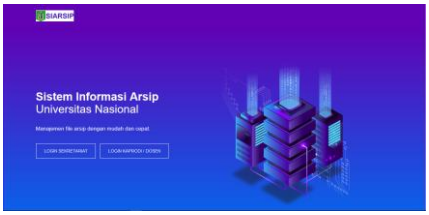

Fig 5 *Dashboard view*

In Figure 5 above is the main dashboard display of the archiving application which has 2 buttons, namely "Login Secretariat" and "Login Head of Study Program / Lecturer"

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2) Secretariat interface

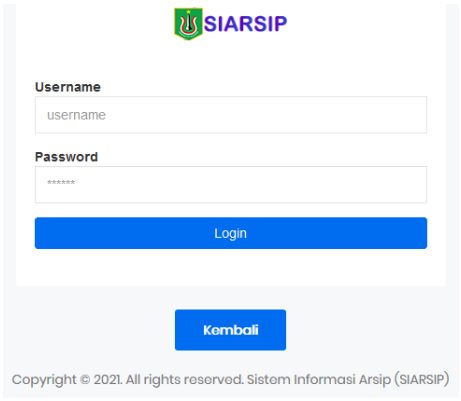

Fig 6 *secretariat login view*

In Figure 6 above is the login interface as the secretariat.

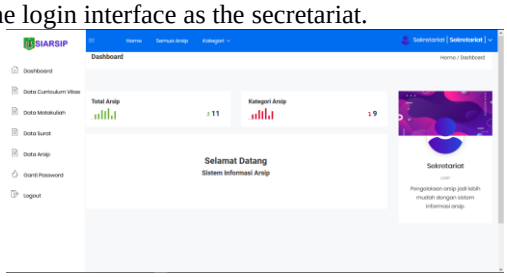

Fig 7 *the main view of the secretariat*

In Figure 7 above is the main display of the secretariat which includes "Curriculum Vitae Data, Subject Data, Letter Data, Archive Data, Change Password, and Logout"

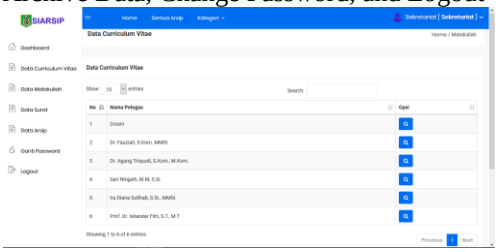

Fig 8 *display of curriculum vitae data*

In Figure 8 above is a display of curriculum vitae data, on this page the secretariat can see the CV data of each lecturer at the Faculty of Information and Information Technology which this feature aims to facilitate the secretariat in providing research, seminars or community service in programs implemented by the Head of Study Program in the future. future, so that the decisions made in choosing lecturers with that objective can be right on target.

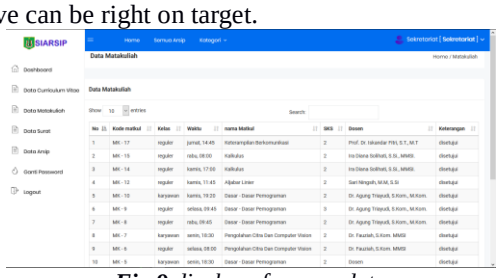

Fig 9 *display of course data*

In the Figure above is the display data for courses that have been approved by the Head of Study Program, where the goal is to be reorganized and placed in the class according to the day and time that has been registered.

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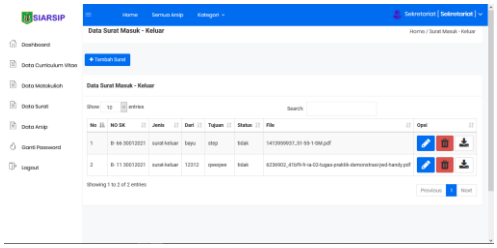

***Fig 10** mail data display*

In Figure above is the most important aspect of the secretariat, on this page the secretariat can make incoming and outgoing letters

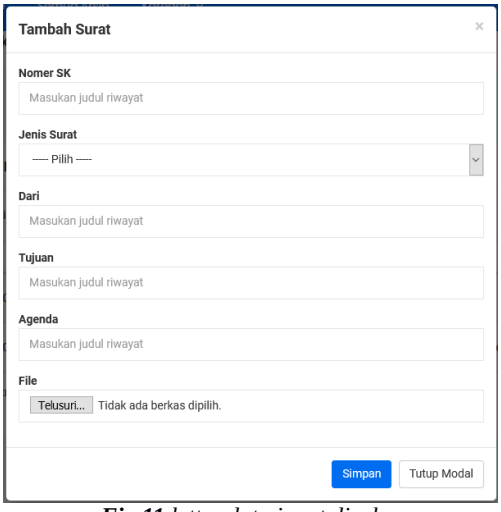

***Fig 11** letter data input display*

In the Figure above is a display of letter input in the form of incoming and outgoing mail input.

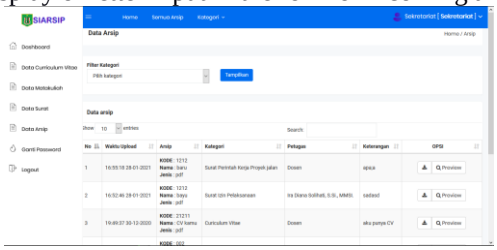

***Fig 12** archive data display*

In this view, it is in the form of archived data that has been recapped and is ready to be executed for the next stage.

3) Lecturer interface

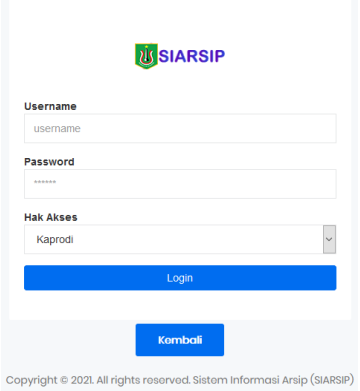

***Fig 13** login view*

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In the Figure above is a login display for lecturers and heads of study programs which are selected through access rights

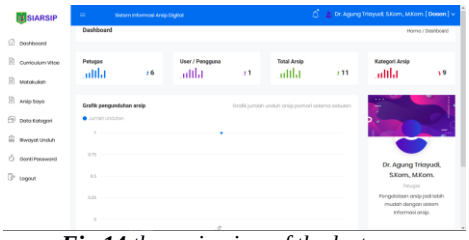

Fig 14 *the main view of the lecturer*

In the Figure above is the main display of the lecturer which features "Curriculum vitae, Subjects, My Archives, Category Data, Download History, Change Password, and Logout"

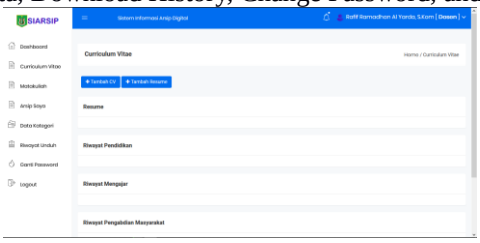

Fig 15 *view of your curriculum vitae*

On this page is a display for lecturers to input their personal data in the form of CV, educational history, teaching history, and history of community service.

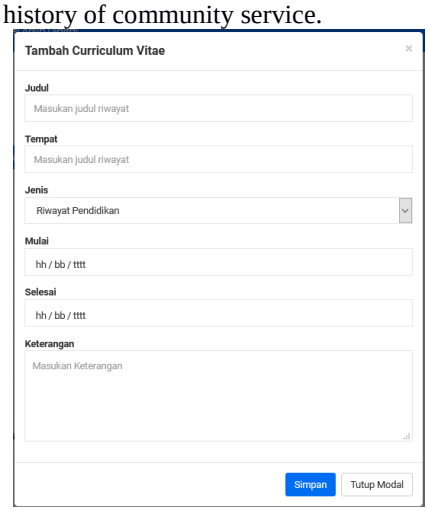

Fig 16 *CV input display*

The figure above is a list of cv inputs in the form of educational history, community service history, and educational history.

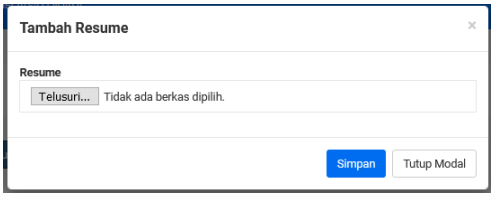

Fig 17 *display input resume*

In the Figure above is a display of uploading a lecturer resume in a pdf file format

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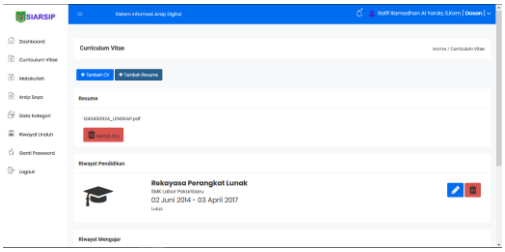

***Fig 18** display of curriculum vitae output*

In the Figure above is the output after the CV data is filled in

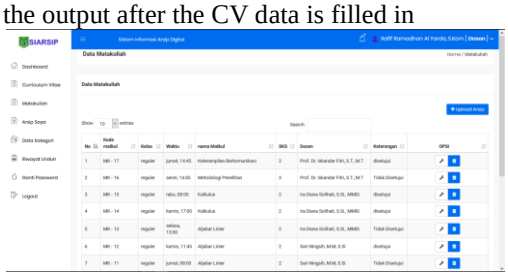

***Fig 19** display of course data*

In the Figure above, the lecturer can see the data of each lecturer who has taken any course, and there is also an archive upload feature

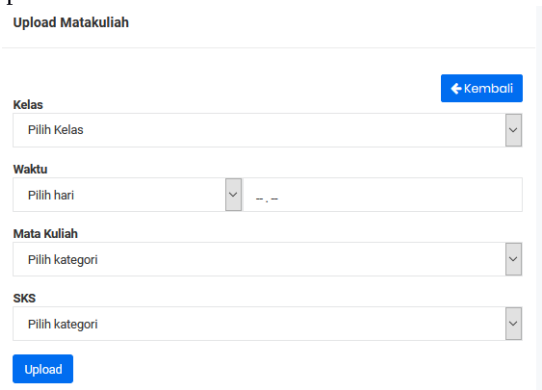

***Fig 20** course upload view*

In the Figure above is to display the course upload contained in the course data feature

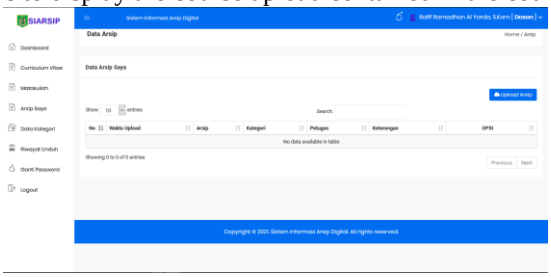

***Fig 21** archive data display*

In the Figure above is a feature for lecturers to upload archives

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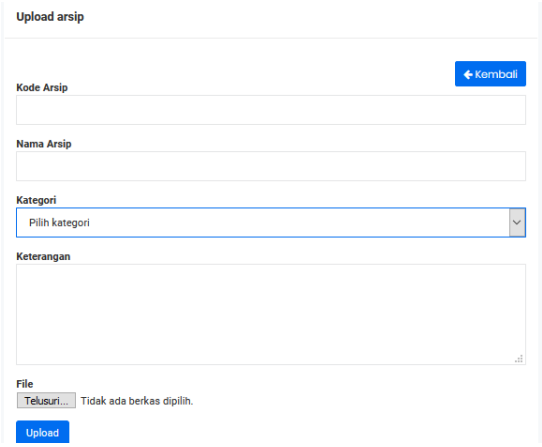

Fig 22 *display uploading lecturer archives*

In the Figure above the lecturer can upload an archive with the category "Decree, implementation permit, road project work order, employee health letter, thesis attachment letter, and incoming letter - faculty activities".

4) Kaprodi interface display

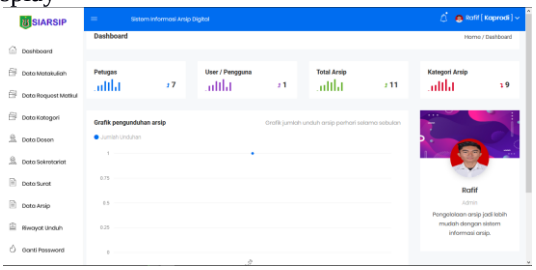

Fig 23 *Head of Department main view*

The figure above is the main display on the Head of Study Program page which features "Subject Data, Subject Request Data, Category Data, Lecturer Data, Secretariat Data, Letter Data, Archive Data, Download History, Change Password, and Logout"

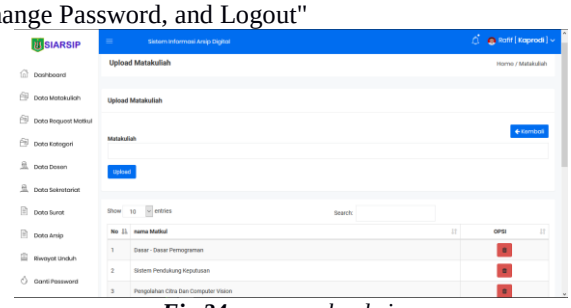

Fig 24 *course upload view*

In the Figure above is a course upload display, at this stage the Head of Study Program can upload a list of courses which will be selected by each lecturer.

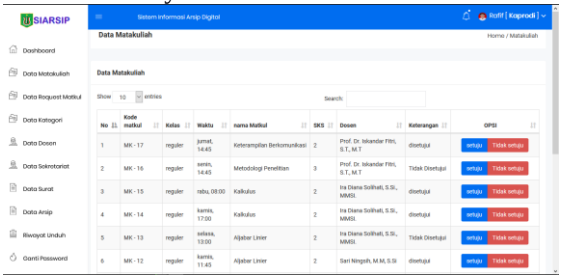

Fig 25 *display matkul request data*

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In the Figure above the Head of Study Program will receive all course requests from each lecturer, and the Head of Study Program will give approval whether the selected course is suitable or not

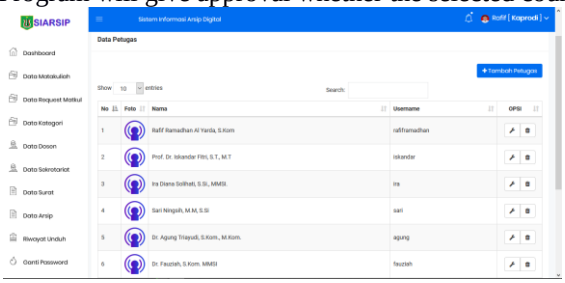

Fig 26 *lecturer data display*

In the Figure above, the Head of Study Program can edit data and add new lecturer data.

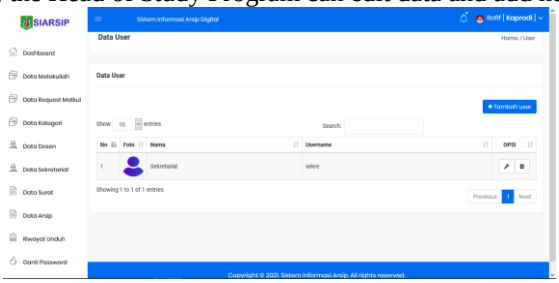

Fig 27 *secretariat data display*

In the Figure above, the Head of Study Program can add and change secretariat staff data.

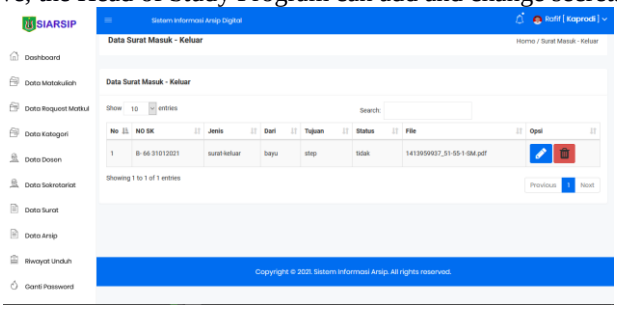

Fig 28 *mail data display*

In the Figure above is the data feature page for incoming and outgoing mail, where the Head of the Study Program can validate and check letters that have been made by the Secretariat.

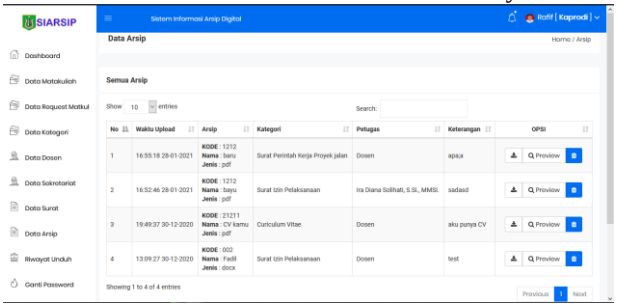

Fig 29 *archive data display*

In the Figure above is a display of the archive data feature, where the Head of Study Program can check archives such as decree, implementation permit, work order, employee health letter, thesis attachment letter, CV, and incoming letters - faculty activities.

c. Testing

After the authors carried out the implementation stage of the broadcasting system, the authors conducted tests using the black box system. Black box system is a method of testing applications or software without having to know the structural code in the system first.

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Table 1.
Black Box Secretariat System

No.	Testing Scenarios	The final result
1	Login as secretariat	Valid
2	Checking each lecturer curriculum vitae data	Valid
3	Checking approved course data	Valid
4	Input incoming mail	Valid
5	Input outgoing mail	Valid
6	Edit incoming mail	Valid
7	Edit outgoing mail	Valid
8	Viewing faculty archive data	Valid
9	Download archives	Valid
10	Change password	Valid
11	Logout as secretariat	Valid

In Table 1. Above are secretariat activities consisting of 11 stages, in this application, the secretariat will focus more on managing archives such as incoming and outgoing letters. From the final results of this test, the system runs with the final results valid or in accordance with what the author wants.

Table 2.
Lecturer System Black Box

No.	Testing Scenarios	The final result
1	Login as a Lecturer	Valid
2	Input data resume	Valid
3	Input educational history data	Valid
4	Input teaching history data	Valid
5	Enter community service history data	Valid
6	Archive data input	Valid
7	Input the courses to be taken	Valid
8	Look at courses that have been approved	Valid
9	Look at courses that are not approved	Valid
10	Changing subjects that are not approved	Valid
11	View archive download history	Valid
12	Change password	Valid
13	Log out as a lecturer	Valid

In Table 2. Above is a lecturer activity which consists of 13 stages, in this application, lecturers will focus more on selecting courses that have been provided by the Head of Study Program, and lecturers can also input data in the form of CV, educational history, teaching history, and history of community service. which this data will be useful for faculty decision making in the future. From the final results of this test, the system runs with the final results valid or in accordance with what the author wants.

Table 3.
Head of Study Program Black Box

No.	Testing Scenarios	The final result
1	Login as the Head of Study Program	Valid
2	Subject data input	Valid
3	Give approval for the course	Valid
4	Give a disagreement to the course	Valid
5	Adding an archive category	Valid
6	Adding lecturer data	Valid
7	Add secretariat data	Valid
8	Check incoming mail	Valid
9	Check outgoing mail	Valid
10	Perform approval validation for incoming mail	Valid
11	Perform outgoing mail approval validation	Valid
12	Download archival data	Valid
13	View download history	Valid
14	Change password	Valid
15	Logout as the Head of Study Program	Valid

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

In Table 3. Above are the activities of the Head of Study Program which consists of 15 stages, in this application, the Head of Study Program will be able to more freely manage data because it is given full access rights, and the main focus is to validate and approve archives that have been managed by the secretariat. From the final results of this test, the system runs with the final results valid or in accordance with what the author wants.

5. Conclusion

Implementation of the E-Archive System at the Faculty of Communication and Information Technology (Case Study: National University) has been able to assist the Head of the Study Program, Secretariat, and Lecturers in recording accurate and well-synchronized data. The Head of Study Program can also make the right decisions from each agenda and the information received, which can help students develop their knowledge and experience with targeted seminars and training.

This waterfall method is used, because each process must be sequential and structured, so that you can avoid data shortages and data and information asynchronization. It can be concluded, that if this application can be applied as a means to assist the administrative activities of the Faculty of Communication and Information Technology, National University, both in terms of oral and written data records. In addition, the Head of Study Program can develop interests, talents, insights, and experiences of students and lecturers to improve the assessment system for faculty accreditation which is routinely implemented because all important data will be recorded properly and easily found.

The author realizes that this research is far from perfect, for that the writer really appreciates the criticism and suggestions that will be given by the supervisors and hopes that criticism, suggestions, and guidance from the lecturers can be given so that in the future it will be even better.

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