Development Of Thesis Repository Application In The Faculty Of Science And Technology Use Implementation Of Vue.Js Framework

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ARTICLE INFO	ABSTRACT
	Information technology can be utilized in the world of education as a means of conveying information about the profile of an institution, as a means of facilitating the running of government, and as a means of supporting other academics. UIN North Sumatra, especially the Faculty of Science and Technology, does not yet have information technology that can store student thesis data, where the application can be used as a search tool for theses that have been published within the Faculty of Science and Technology. By storing thesis manuscripts electronically, it will also make it easier to track the track record of each student and lecturer in preparing the thesis. Through the electronic thesis data storage application, the lecturers and thesis students can find out what titles have been published so that they can be used as indicators of what science is currently developing in the Faculty of Science and Technology. Based on the thesis data stored in an application, later this data can also be used for accreditation or academic purposes. Making this system researchers use the Vue.js Framework which is a flexible framework, Vue.js can be integrated with other frameworks or libraries such as Django, Laravel and WordPress. By implementing the Vue.js framework in website-based application development, the website can be embedded with one-page application features so that it will be easier to use the application.

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1. INTRODUCTION

The Along with global technological advances, it has affected all aspects of life, both in the economic, political, cultural, artistic and even educational fields. Technological progress is something that we cannot avoid in this life, because technological progress will go hand in hand with scientific progress[1]. Science is growing from time to time. The development of this science supports the creation of new technologies that mark the progress of the times. Until now, the developing technology has entered the digital stage. Including in Indonesia, every field has started to utilize technology to facilitate work, including in the field of education[2].

State Islamic University of North Sumatra (UIN Sumatra Utara) as an advanced educational institution has implemented information technology in its academic activities, the application of information technology at UIN North Sumatra includes helping students and academic lecturers in the process of filling out Study Plan Cards (KRS), see the Study Result Card (KHS) and attendance. Even though UIN North Sumatra already has several academic support applications, UIN North Sumatra, especially in the Faculty of Science and Technology, does not yet have an application regarding storing student thesis data, where the application can be used as a track record for every student and lecturer in compiling a thesis. The previous research that became a reference in conducting this research was Riswan's paper entitled "Design of STMIK Nurdin Hamzah's Thesis Title Database to Avoid Plagiarism"[3].

In this paper the research only builds a system that can store theses at the university, the system is unable to display data such as data on the number of students whose thesis has been guided by a lecturer. Then Nizirwan's paper, entitled "Automatic Alerts on the Internet of Things Smart Motion Detection System"[4]. Using the protocol (SMTP) as a port to send warning emails to clients. The main function of SMTP is to transmit messages from a sending computer to a recipient, either on the same network (LAN or WAN) or on a different network [5]. This is considered sufficient to create a reminder application in the repository system later to remind students who have not submitted their thesis to the faculty. Based on previous observations and research, there are several things that can be done or developed in order to overcome these problems. Which in the development of this

system will be made in the form of a website and use the Vue.js framework. Applying Vue.js as a framework that supports the creation of interactive website interfaces, the resulting website will be a website that is easier to use. Vue.js is a flexible framework, Vue.js can be integrated with other frameworks or libraries like Django, Laravel and WordPress[6]. Therefore, based on the background above, a study entitled "Development of Thesis Repository Applications in the Faculty of Science and Technology with the Application of the Vue.js Framework" was appointed.

2.   RESEARCH METHOD

This research method uses qualitative methods, for data collection techniques used in qualitative research methods are in-depth interviews and participatory observation[7]. The development method used in making this system is Rapid Application Development (RAD). RAD is a lifecycle strategy that aims to deliver much faster development and achieve higher quality outcomes than traditional cycle outcomes[8]. The stages of developing this system can be seen in the following figure:
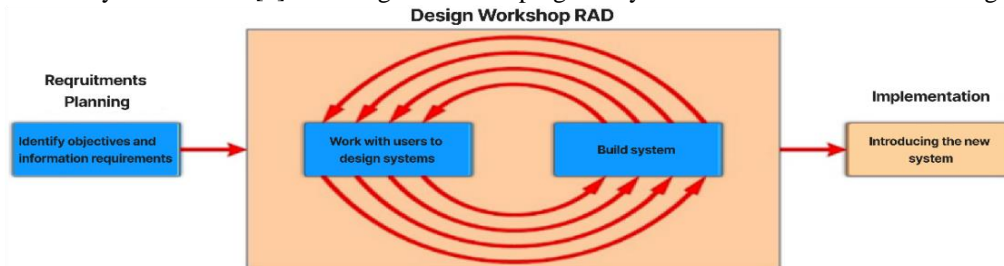
Figure 1 RAD Stages Process

The following is an explanation of the stages in the image above as follows.

1)   Requirements Planning; The Requirements Planning stage is the initial stage in developing the system, the Requirements Planning stage is carried out to find out what is needed to build this repository system. The needs referred to include the need to know about the process of storing thesis that has been/is underway at the Faculty of Science & Technology and then the documents or thesis titles at the Faculty of Science & Technology as well as other validation documents.

2)   Design Workshop; The design workshop is an advanced stage of Requirements Planning, in this phase system development can already be carried out starting from designing the system to makicng prototypes. The design that will be built in the form of a prototype later is like a thesis title search page, thesis input page, and a report viewer page related to thesis data. This development will continue to be accompanied by system users such as lecturers and students at the Faculty of Science & Technology UIN North Sumatra in order to suit the needs of system users.

3)   Implementation; This repository system will be implemented using web programming languages such as PHP and Java programming languages. Systems built using web programming languages will be more accessible to application users, so that the system will be effective in its application. The implementation phase is the phase in which system analysts and developers design technical and non-technical aspects, after which the system will be tested more deeply to find out aspects of weaknesses and strengths so that it can be redesigned so that the system can be introduced and used at the Faculty of Science & Technology UIN North Sumatra .

3.   RESULTS AND DISCUSSION

3.1. Analysis
1)   System Analysis
    a. Running System Flowmap
        The flowmap in the image below is the initial system process in the faculty of science and technology.
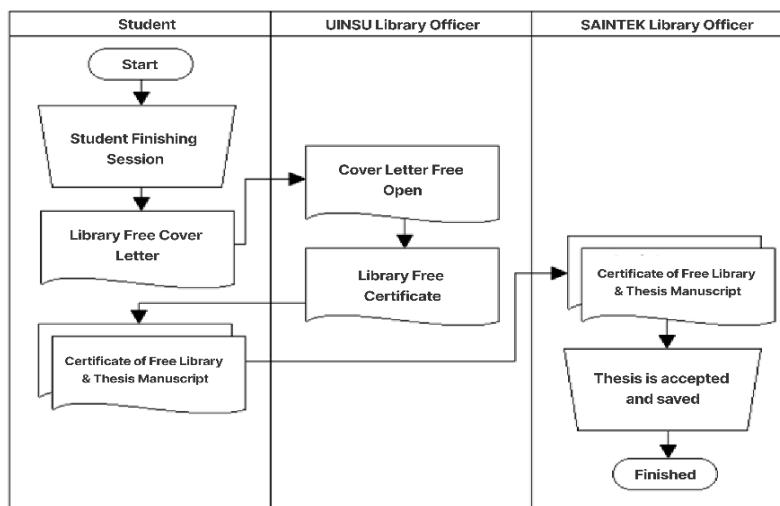
Figure 2 Flowmap analysis of the running system

b. Proposal System Flowmap

The flowmap in the image below is a proposed system process that has been built by the author for the Faculty of Science and Technology. This Flowmap has 3 actors, namely students, lecturers, and the head of the library.
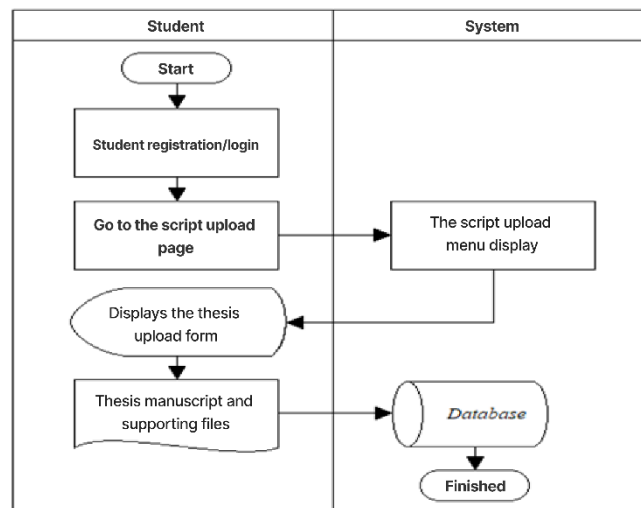

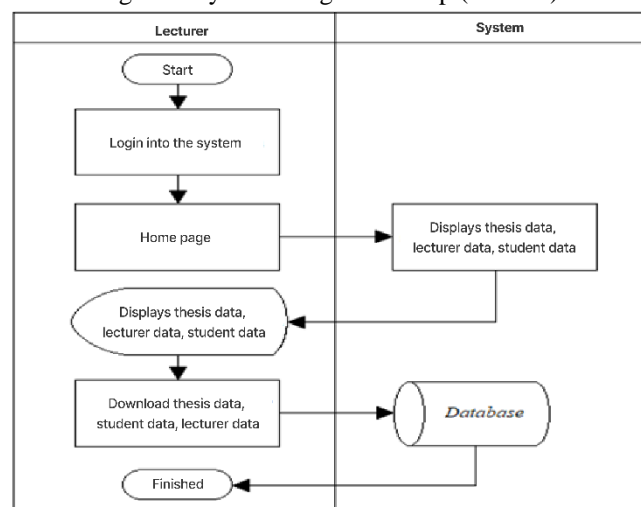Figure 3 System Usage Flowmap (Student)
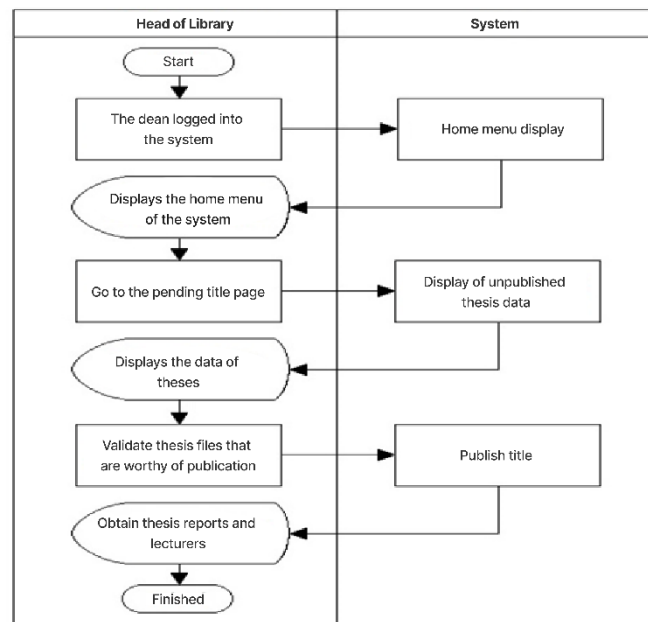

Figure 4 System User Flowmap (Lecturer)

Figure 5 System Usage Flowmap (Library Head)

2)   UML (Unified Modeling Language)

The Unified Modeling Language (UML) is a tool for developing object-oriented systems. UML is used as a tool in the development of object-oriented systems because it provides a visual modeling language that enables system designers to create their designs for their vision in a standardized format that is easy to understand and comes with an efficient sharing mechanism. . and share. to share their plans with others[9]. UML itself also provides a standard for writing system designs that include business process concepts, writing classes in certain programming languages, database schemas, and components needed in the system[10].

a.   Use Case Diagram

Use case is a technique for mapping the functional requirements of a system and represents one goal of the system and describes a series of actions and user interactions to achieve that goal[11]. In the picture below, it has 4 actor roles namely Student, Public, Lecturer, Head of Library.
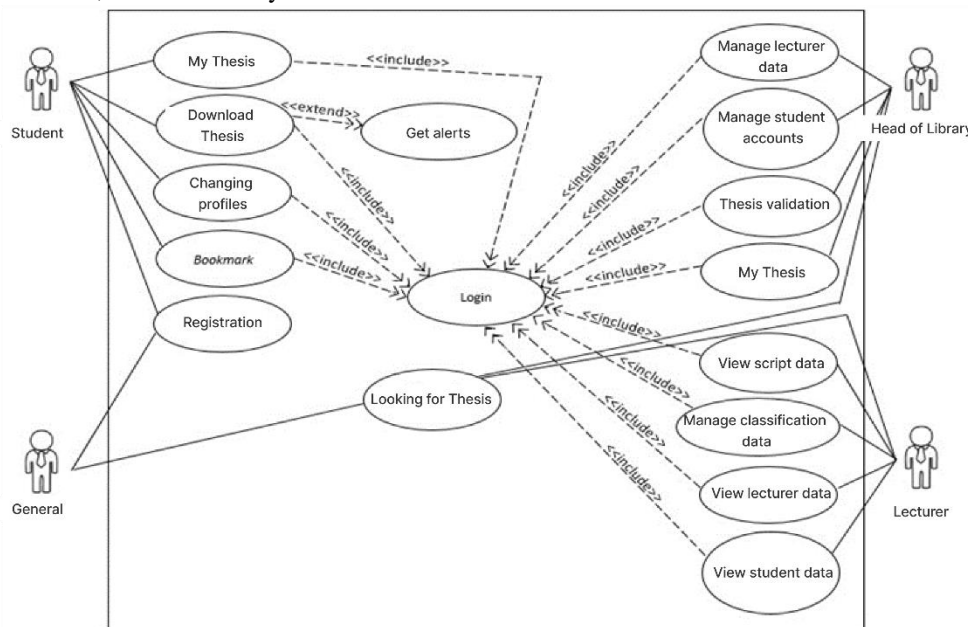
Figure 6 Use Case Diagram

b.   Activity Diagram

Activity diagrams describe the flow of activities within the system being designed, how each flow begins, the decisions that can occur, and how they end. Activity diagrams can also describe parallel processes that can occur in several executions[12].

Explanation of the picture below to upload a thesis data, students must log in first so that the uploaded thesis can be accounted for by the student concerned. If the student has successfully uploaded his thesis file, the head of the library will validate the files uploaded by the student. If you meet the requirements. then the data can be stored in the database.
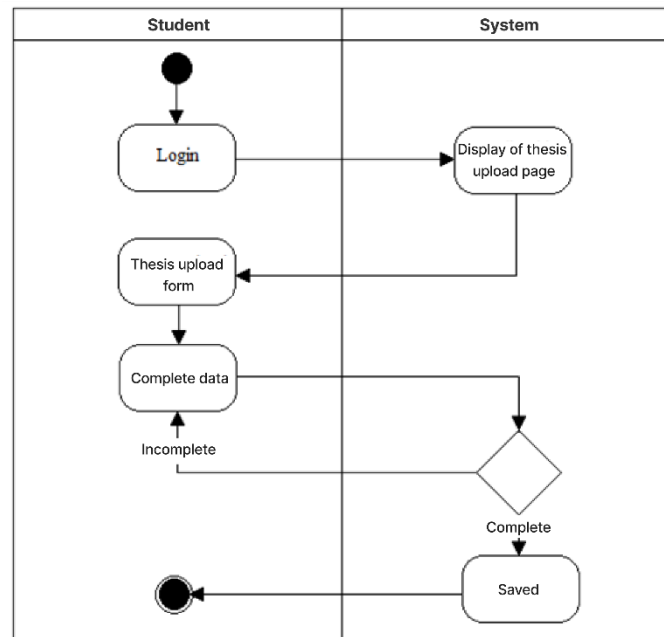
Figure 7 Upload Thesis Data (Student)

This activity is the main activity in the thesis repository system. This activity can be performed by all system users. The flow of this activity starts from entering the thesis title page. However, before typing in the desired keywords, users can filter the search to narrow the search to make it easier to search for the desired title. If the title you are looking for has been found, then the user can download the thesis or simply save it as a list that the user has searched for.
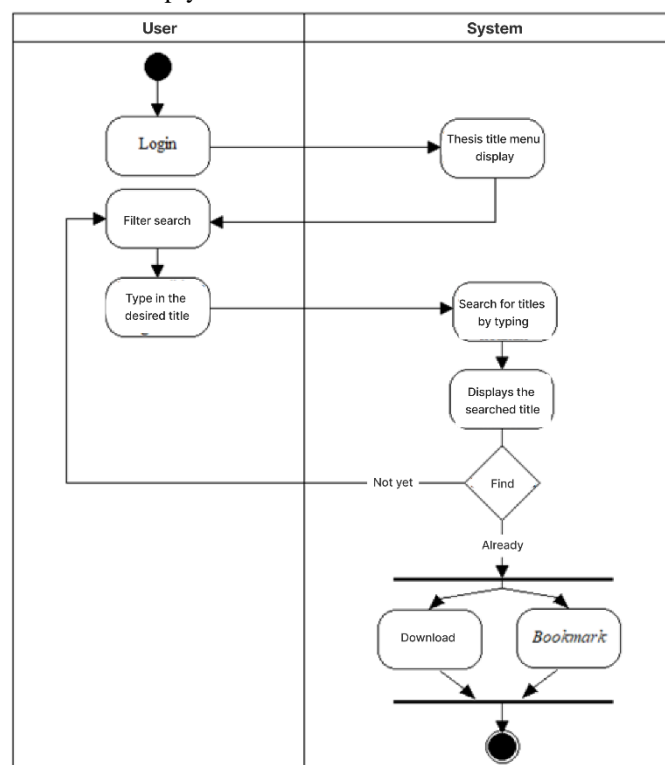
Figure 8 Activity Diagram Thesis Bookmarks (Students)

After the student has successfully uploaded the thesis data and stored in the database. The thesis data will then be displayed to the library staff for further review regarding the contents of what has been uploaded by the student concerned. Lecturers will assess the legitimacy of these documents manually, if these documents are deemed sufficient to be validated, then the thesis can be published and can be accessed by other system users.
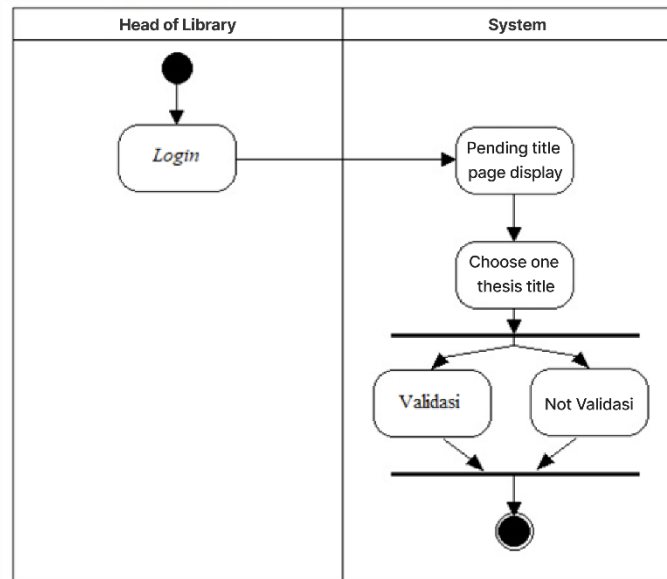
Figure 9 Validation of Thesis Title (Head of Library)

Another activity that can be carried out by lecturers is to view student data. Each lecturer can see the entire list of students who are in the same study program with that lecturer, or can see a list of students who are only supervised by him. The following is an activity diagram of viewing student data carried out by the lecturer.
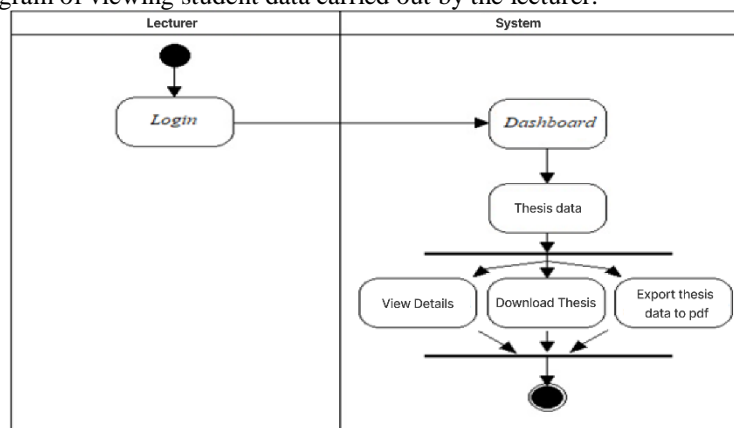
Figure 10 Activity Diagram Viewing Thesis Data (Lecturer)

c.   Sequence Diagram

Sequence diagrams explain the interactions between objects in and around the system in the form of messages arranged in a time sequence, namely the sequence of events carried out by an actor in running the system[13]. The explanation in the image below describes how to flow a thesis so that it can be published by the system.
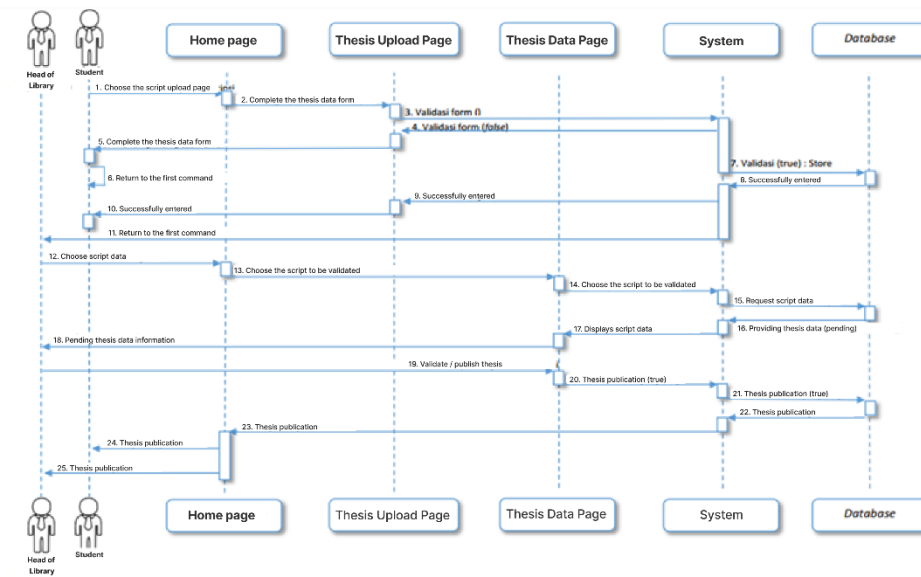
Figure 11 Sequence Diagram of Thesis Validation (Head of Libraries and Students)

The explanation in the picture below is done by the user (student). Starting from students who have successfully logged in who will be directly confronted with a home page that already contains a collection of published theses. There will be options given to the user, namely download and bookmark. After the system gets the bookmark action. The system will save the thesis bookmarked by the user according to the user who bookmarked it, then the database will respond to the system that the thesis has been successfully bookmarked and the system will inform the user what thesis has been bookmarked.
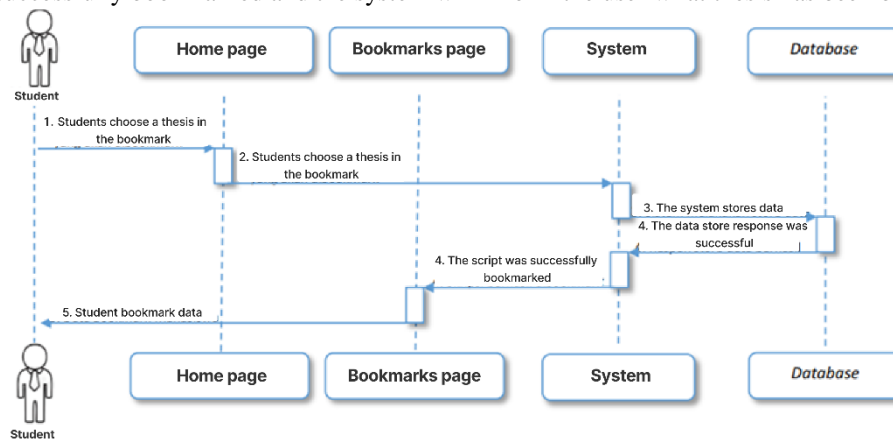
Figure 12 Sequence Diagram Bookmark (Student)

This sequence diagram explains how the lecturer flows in obtaining the thesis data, starting when the lecturer opens the thesis data page, the thesis data page will request data from the system, the system that has received an operation to bring up data, then the system will request a request from the database, namely in this case all thesis data, the database will provide to the system where the data is packaged in tabular form which eventually appears on the thesis data page and can be seen by system users.
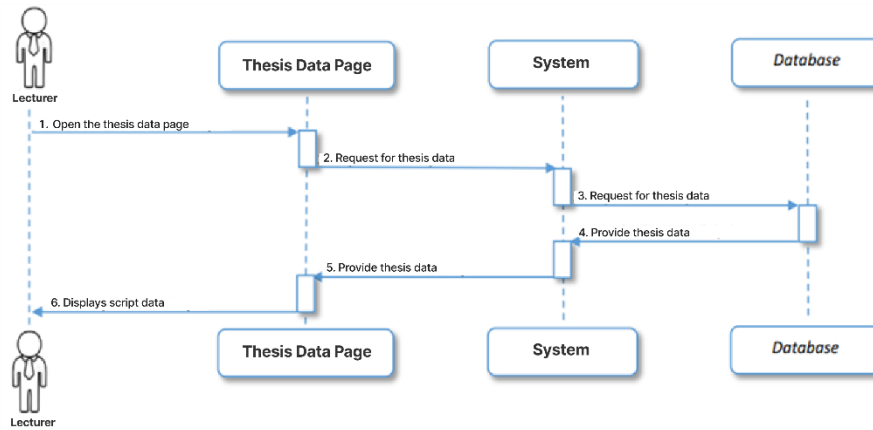
Figure 13 Sequence Diagram Viewing Thesis Data

d.   Class Diagram

Class diagrams that describe the structure of the system, starting with the definition of the classes needed to build the system. Class diagrams describe the types of objects in the system and the various static relationships that exist between them[14].
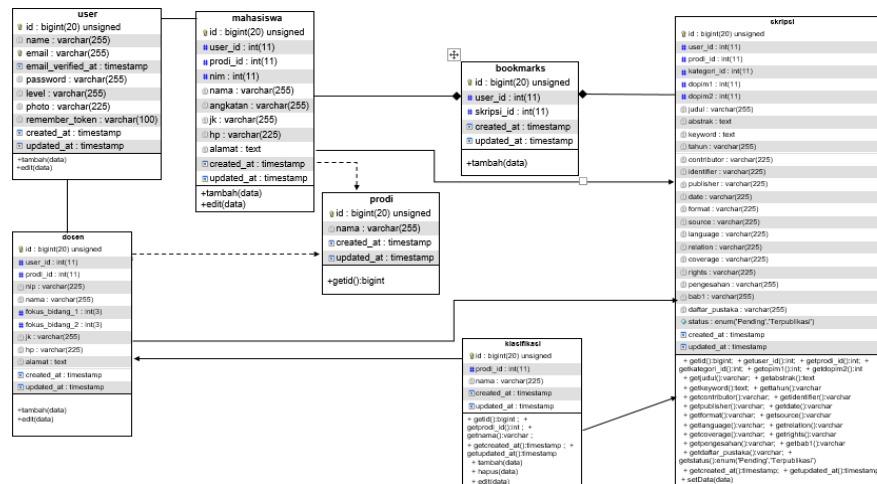

Figure 14 Class Diagram

3.2. Implementation
1)   System Implementation

The following is a display of the My Thesis (Student) page. This page will be filled in when students have uploaded their thesis.

Figure 15 Dashboard Display, My Thesis (Student)

The following is a display of the form from the Thesis Upload page owned by the Student.

Figure 16 Dashboard View, Upload Thesis (Student)

The following is a display of the thesis data page owned by the user (lecturer).

Figure 17 Dashboard, Thesis Data (Lecturers)

The two pictures below are the display of student data pages in the Lecturer session. Lecturers have the right to see all student data in the same study program environment as themselves. From here the lecturer also sends notification emails manually as a reminder for students who have not uploaded their thesis by pressing the "notification" button.

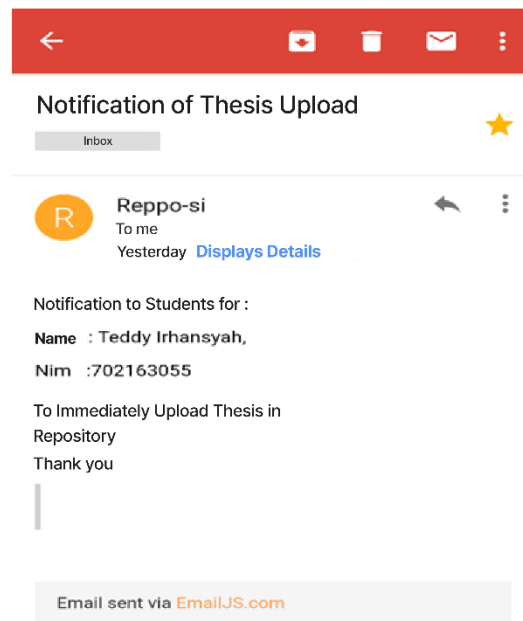Figure 18 Dashboard, Data Student (Lecturer)

Figure 19 E-mail Notification from Repository System

3.3.   System Testing

In testing the thesis repository system using the Vue.js framework at the Faculty of Science and Technology, the Black-box Testing method was used and this test was carried out by Mr. Ali Ikhwan as a Lecturer and Head of Library at the Faculty of Science and Technology, Sumatra State Islamic University. Black-Box Testing is testing that focuses on the functional specifications of the software, the tester can determine a set of input conditions and perform tests on the functional specifications of the program[15]. The following are the results of tests conducted by the author:

Table 1. Test Results Testing

No	Test Scenario	Test Result
1	Registration Process Testing	**Succeed**
2	Login Process Testing	**Succeed**
3	Testing Thesis Search Process	**Succeed**
4	Testing Thesis Filter Process	**Succeed**
5	Testing the Thesis Upload Process	**Succeed**
6	Testing Thesis Publication Process	**Succeed**
7	Testing the Process of Adding Lecturer Data	**Succeed**
8	Password Change Process Testing	**Succeed**

4.   CONCLUSION

Based on the research that has been done by the author, several conclusions are drawn including the following. Electronic media has been developed that is capable of facilitating the storage of theses within the Faculty of Science and Technology UIN-SU, a platform that can assist the performance of lecturers and students in searching for data related to theses such as finding theses that have been published within the Faculty of Science and Technology, knowing the number of students who have have been guided by lecturers, even reminders (alerts) to students who have not uploaded their theses. Then the application of Vue.js as a framework on this website makes the website easier to develop so that by implementing the single web application feature on this repository system it can speed up website performance in presenting data, and make the website more comfortable to use.

5.   SUGGESTION

In this research there are still many shortcomings that may be refined in the future by future research. Suggestion that can be used is that the application might be more user friendly so that it is easier to use again and maybe more features can be added.

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