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Design Web-Based Information System of Tri Dharma Higher Education for Lecturer

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Abstract

Tri dharma of higher education consisting of education & teaching, research, and community service which must upheld by every lecturer at universities in Indonesia. Lecturer who has implemented the tri dharma of higher education need these tri dharma files for promotion and lecturer performance report to get allowance. It is important to have an online system to store those files. In this research we develop a web-based information system for processing lecturer tri dharma activities data using Rapid Application Development (RAD) Method which started from requirement planning, system design, and implementation.

Keywords: Tri Dharma, Information System, Lecturer Data

1. Introduction

Information technology is one of the technologies that almost needed in every aspect of life. One of the very rapid advances in information technology is terms of data processing which really useful to ease the work that is done manually. Technology has an important role in the management of data in higher education, so these data need to be manage or process using good and appropriate technology and it can obtain useful information. An organization including higher education institutions require this data processing, both of manual data processing or electronic data processing. Every university naturally has data on lecturer and student that must be precise and accurate. However, the data are very complete and requiring higher education institutions to design or build a system that is able to overcome problems that will arise such as incomplete data, difficulty in finding the desired data, the appearance of the same data, and other problems.

Tri dharma of higher education is one of the goals that must be achieve and carried out by every university in Indonesia. Lecturer have a duty to carry out the tri dharma of higher education that including of education & teaching, research and community service which is inseparable of the duties and functions of lecturer. Lecturer who have implemented the tri dharma of higher education have a lot of data that must be store or manage properly such as data entry education & teaching lecturer, data entry community service, data entry article or activities lecturers, and others. The purpose of managing and structuring technology is to be able to produce information that is accurate, transparent, and has accountability and professionalism at work. The presence of online technology such as internet services is very helpful for users in accessing information from the data presented.

Along with the increasing number of lecturer in universities nowadays, it is necessary to have system that can manage and organize lecturer data about their education & teaching, research, community service, personal data, background, publications, and others. Design web-based information system of tri dharma higher education for lecturer is a solution for managing and organizing lecturer data to make it more effective and efficient. Utilization of this information system provides several advantages for lecturers that can make it easier and faster for lecturers to find their data in the system, whether it is for the purposes of their tri dharma activities, promotion, and lecturer performance report. This situation makes this system indispensable for lecturers because it can make it easier for lecturers to find their data anytime and anywhere through internet access.

2. Literature Review

2.1 Tri Dharma of Higher Education

Higher education under law No.20 2003 of Indonesia Republic, is an organization that is obliged to provide education, research and community service (Tri Dharma) and has the autonomy to manage its own institutions. Borg and Gall 1983 defines research and development is the process used to develop and validate educational products. The steps in the research and development cycle were found in the final used configuration and the shortcomings identified in the filed-testing stage. In more rigorous research and development programs, this cycle up to field testing shows that the product has achieved the operating goals. A good and comprehensive education system in universities is certainly not just a transfer of knowledge from lecturer to student. But the role of educating must also be the responsibility of the lecturer as an educator in the university.

2.2 Information System

According to Romney and Steinbart (2015), system is a circuit consisting of two or more interrelated components that mutually relate and interact with each other to achieve goals where the system is usually divided into smaller sub system that support larger system. Information is a data presented in a useful form to decision making activity (Gelinas et al., 2012). Information system is a collection of components that collect, process, store and provide output from any information that required in business process and application use through the software, database, and even interrelated manual processes (Satzinger et al., 2012). Information systems make it quick and easy for communities to get information. The development of information system is growing rapidly, along with the development of current technological such as internet. The internet is a more efficient and practical media. The web is one of the internet services that widely used by organizations, companies and educational institutions.

2.3 Rapid Application Development (RAD)

RAD is a set of methods designed to overcome the weakness of traditional system development methods such as the waterfall model and their variants (Dennis et al., 2014). Another definition states that RAD is existence cycle method that's meant to offer a quick improvement and get the result with high quality compared with the result achieved through conventional cycle (Metev and veiko 1998). From the definition of this RAD concept, it can be seen that application development using RAD method could be done relative quickly. Meanwhile, according to kendall (2010), RAD is an object oriented approach to system development that includes a development method and software. RAD aims to shorten the time normally required in development life cycle of traditional systems development between designing and implementing an information system. Eventually, RAD is trying to fulfill the business terms that changing rapidly. There are 3 phases in RAD namely requirements planning, design workshop and implementation.

3. Materials and Methods

3.1. Materials (TN Roman 11pt)

The objects of this research are all data of lecturer tri dharma that include of education & teaching data, research data, and community service data. This research was conducted by interviewing lecturer at Faculty of Mathematics and Natural Sciences Sam Ratulangi University Manado. The result of this interview are the system requirements data that needed to build this lecturer information system.

3.2. Methods

This research method include of two stages starting with data collection that consisting of literature study, observation, and interviews and in the second stage, namely system development using the Rapid Application Development (RAD) method. This RAD approach is a method that created the system using a fast method with popular strategy in developing software (Kendall, 2010). This fast step is made possible by the focus of RAD to minimizing the planning stage and maximizing the prototype development. The stages of the Rapid Application Development method are:

a. Requirements Planning
The identification of required information and problems faced is carried out to determine the objectives, system limitations, constraints, and alternative solutions to problems. The analysis is used to determine the system behavior and also to find out what activities are in the system.
b. Design Workshop

This phase involve an analysis of the system created by an expert based on the data received and the acquisition of knowledge. The overall system design is carried out based on the analyzers that have been carried out previously. The results obtained are in the form of modeling, database design, and interface design.

c. Implementation

After the design is complete and agreed with the user, the next step is to translate the design into a code programming technique. The study uses the programming language PHP which is used on the server side (Padhye et al., 1999). This stage is implemented the system in programming against the results of the system requirements and could be explain in database implementation stage and program coding.

4. Results and Discussion

4.1 Requirements Planning

This stage contains activities to identify the purpose and requirements of the information on the system that being built. Identification of system development goals has been described on the introductory chapter, while the identification of information requirements is done by identifying user requirements for the building system. Therefore, observations and interview were carried out to get what requirements that needed in building an information system of tri dharma higher education for lecturer. Based on the results of observation and interview that have been made, the following requirements are obtained:

4.1.1 Access Rights

a. Access level consists of admin level, lecturer level, and guest level
b. Information that managed by the system, related to lecturer data information in the form of lecturer profile, education & teaching data, research data, community service, seminar training, and supporting data lecturer.
c. Lecturer registers his own account
d. Lecturers can only see the profiles of the lecturers
e. Lecturers can view, add, and change personal data
f. Visitor can only see the profiles and list of lecturer at faculty of mathematics and natural science sam ratulangi university
g. Admin has full access to the system

4.1.2 Functional Ability

a. Log in
b. Register
c. Adding Data
d. Changing Data
e. Deleting Data
f. Sorting Data
g. Uploading Data
h. Searching Data
i. Log Out

4.2 Workshop Design RAD

After Analyzing the information system that will develop, then next step is designing the system. To assist in planning the system, it takes requires tools in the form of image or diagram. In this methodology, the author use development tools structured systems that include:

4.2.1 Use Case

Use case diagram illustrate the relationship of actors with business processes that exit in the system .Use Case are made in 3 forms namely admin level, lecturer level and guest level.

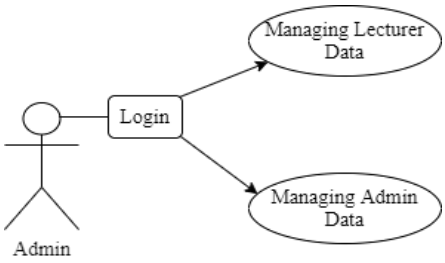

Figure 1. Use Case Admin

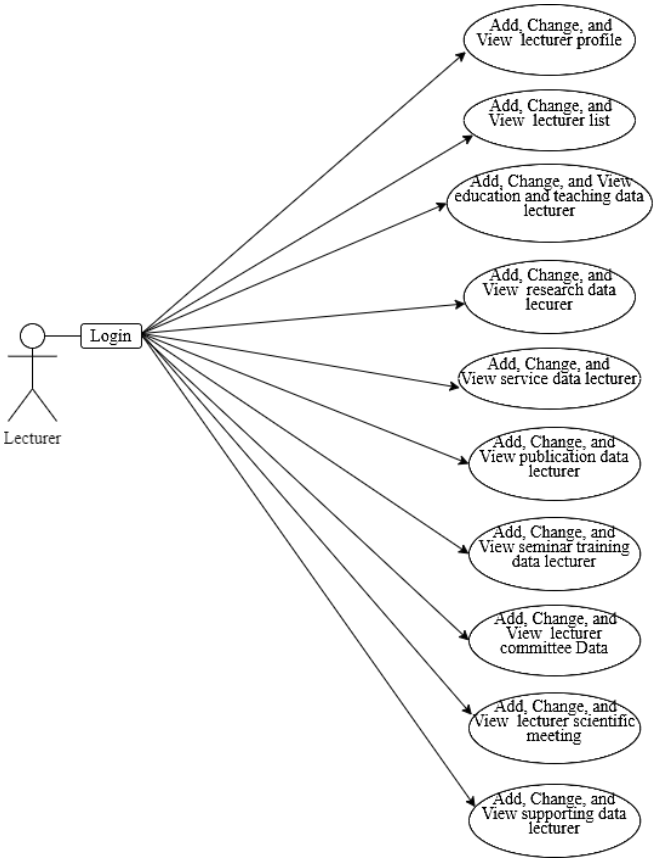

Figure 2. Use Case Lecturer

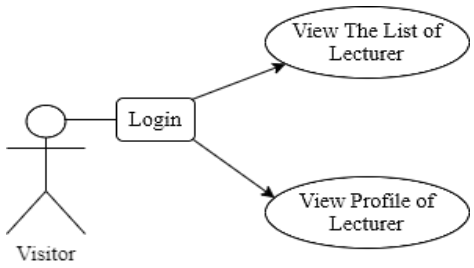

Figure 3. Use Case Visitor

4.2.2 Diagram Context

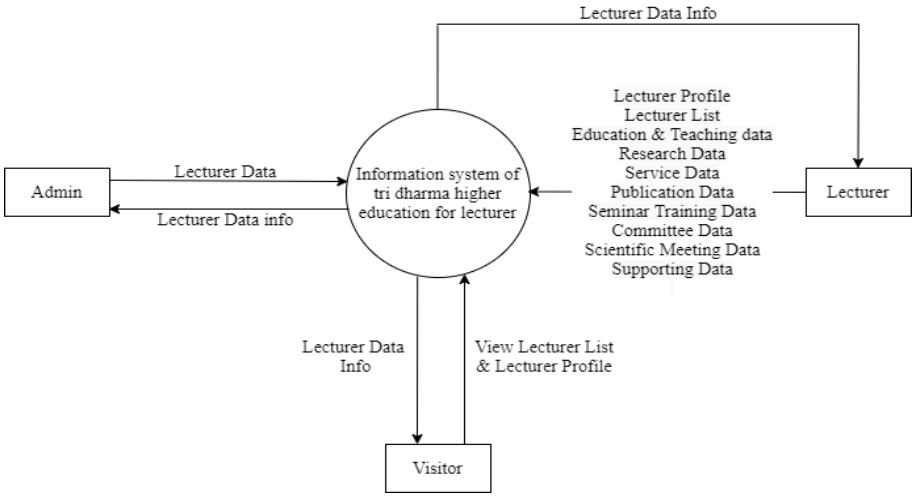

Figure 4. Diagram Context

A context diagram sometime called as level 0 data flow diagram which is drawn in order to define and clarify the boundaries of the software system. From the context diagram above, it can be seen that admin has full access to the system. Admin can do anything with the data that lecturer have entered into the system such as editing or deleting the data. Lecturer account registration is not done by the admin but by lecturer themselves. Therefore, the admin can control who has registered into the system, if the admin sees any suspicious action then the admin can delete that account. For lecturer, they can input and store their data into the system according to their requirements. Another case for visitor who are not included in the category of lecturer or admin, they can only see general data of lecturer such as lecturer profile and list of lecturer.

4.2.3 Data Flow Diagram Level 1

Data flow diagrams in the design of information system are useful for describing procedures that must be develop in a programming language along with the data flow that flows between these processes. Data flow diagram also provides a comprehensive overview of the system scope.

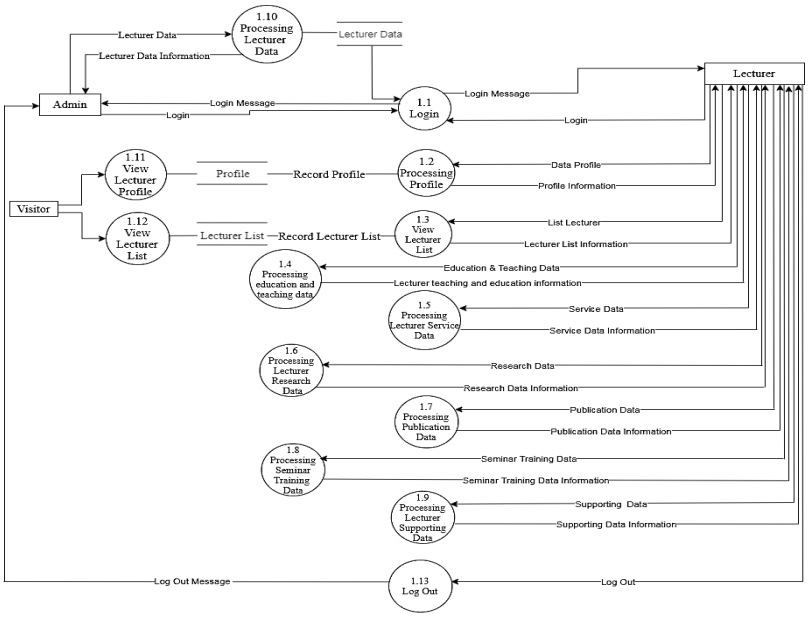

Figure 5. DFD Level 1

Figure 5 provides information that admin and lecturer need to login first in order to enter the core of the system. After the admin enters the system, admin can immediately process lecturer data in the system. Because the admin has full access to the system, they can input data, edit, or even delete the data. In this case, admin can do anything to the system under the required condition. For lecturer who have logged in, they are able to manage their data. They can input, edit, save their data or upload their data into the system easily according to their requirements. As for visitor, they don't need to login like admin and lecturer because they can only access lecturer general data such as lecturer profiles and also they can see the list of lecturer.

4.2.4 Data Base

To create this information system, it takes a database consisting of 10 tables as shown in the following figure:

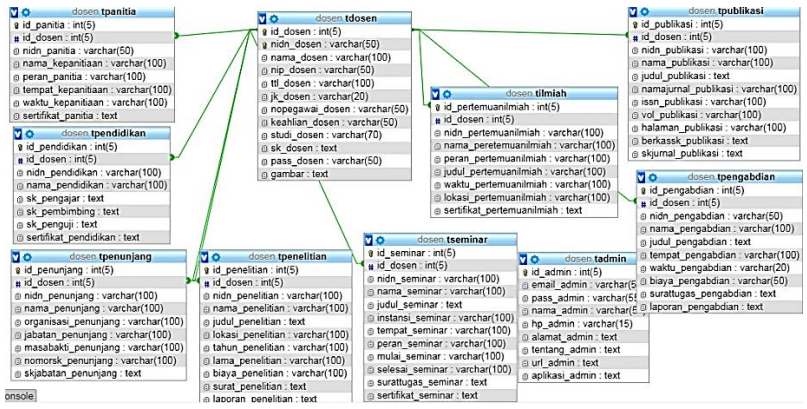

Figure 6. Data Base

4.3 Interface Implementation

Information system of tri dharma higher education for lecturer at this stage implements a system interface for system requirements analysis and system planning processes at this stage. Here is the result of gradual capture of the image on the system:

4.3.2 Login Page for User

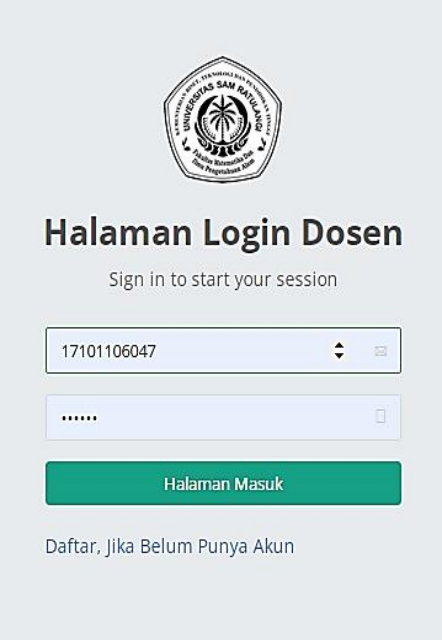

Figure 7. User Login

This login page also known as the system access page that requires lecturer to register or create an account first and then log in with username and password that has been made.

4.3.3 User Interface

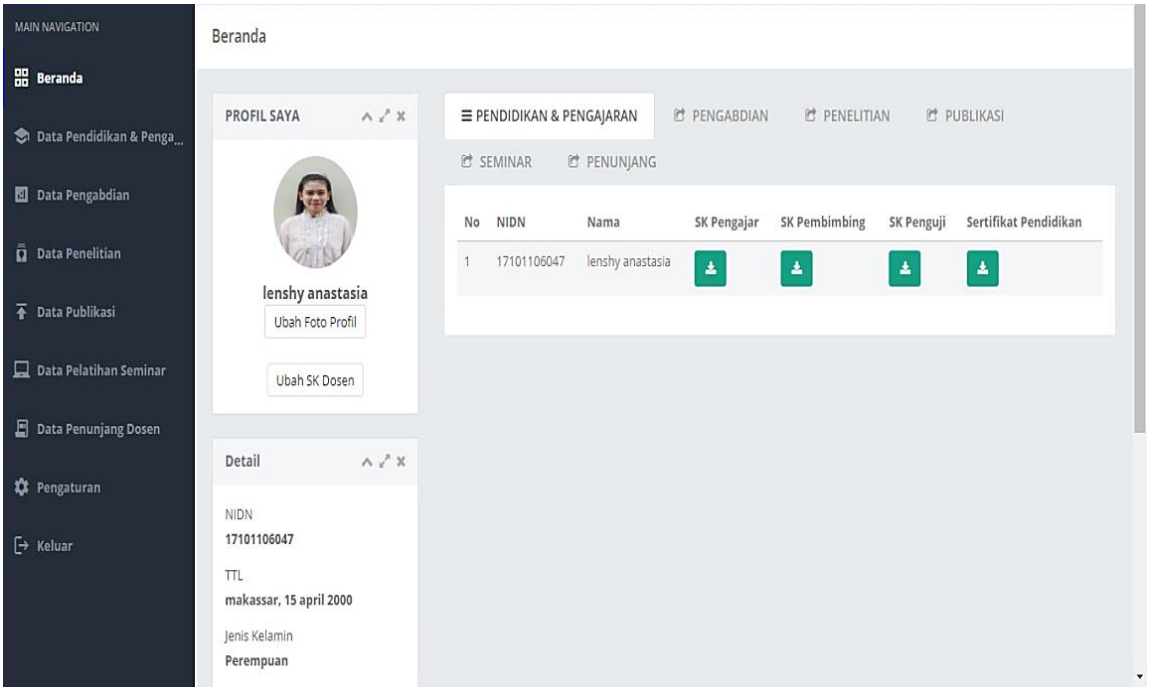

Figure 8. User Interface

This interface is the main page of this system that all users can access the system using the menu bar that available accordance with the respective access right.

4.3.4 Lecturer Menu

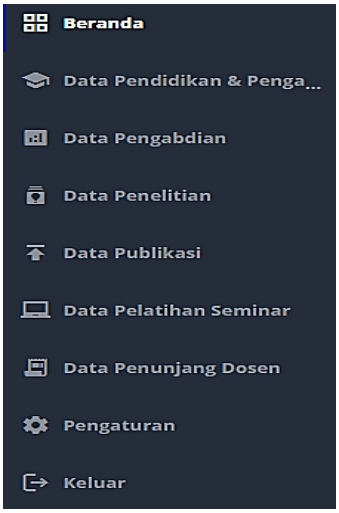

Figure 12. Lecturer Menu

In every account that owned by lecturer, there are several menus in the left corner of this user interface. These menus are similar in appearance and function. If lecturer want to enter the data safely and neatly arranged, lecturer must fill or upload the data first into the existing menu.

4.3.5 Input Data Page

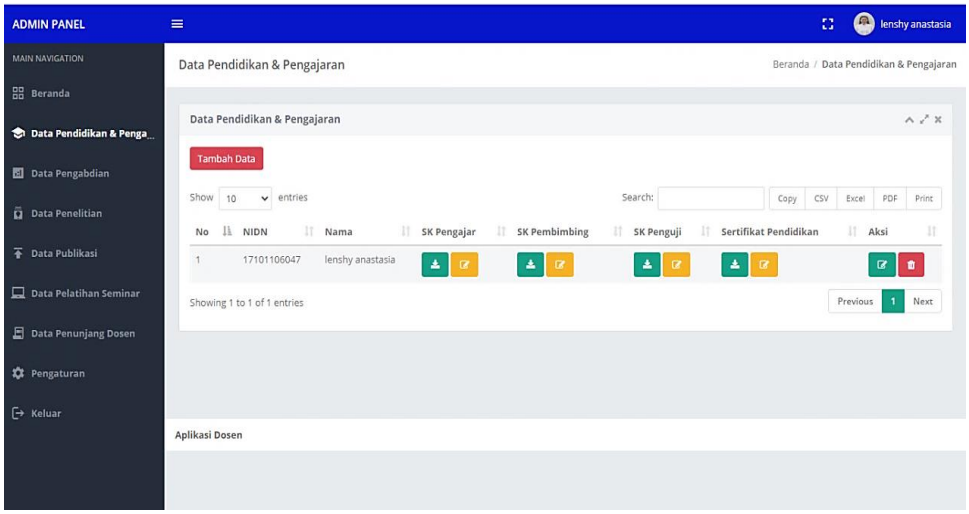

Figure 13. Education Data

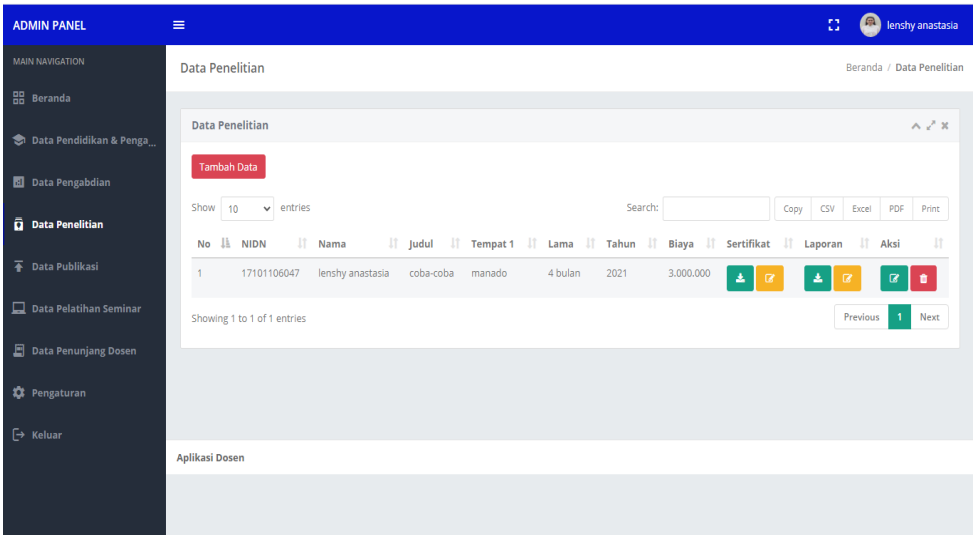

Figure 14. Research Data

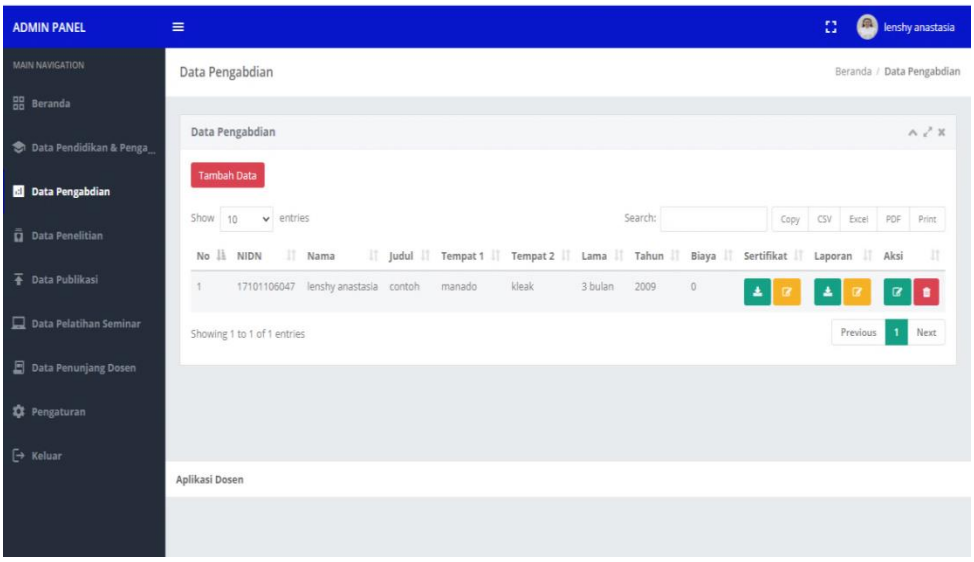

Figure 15. Community Service Data

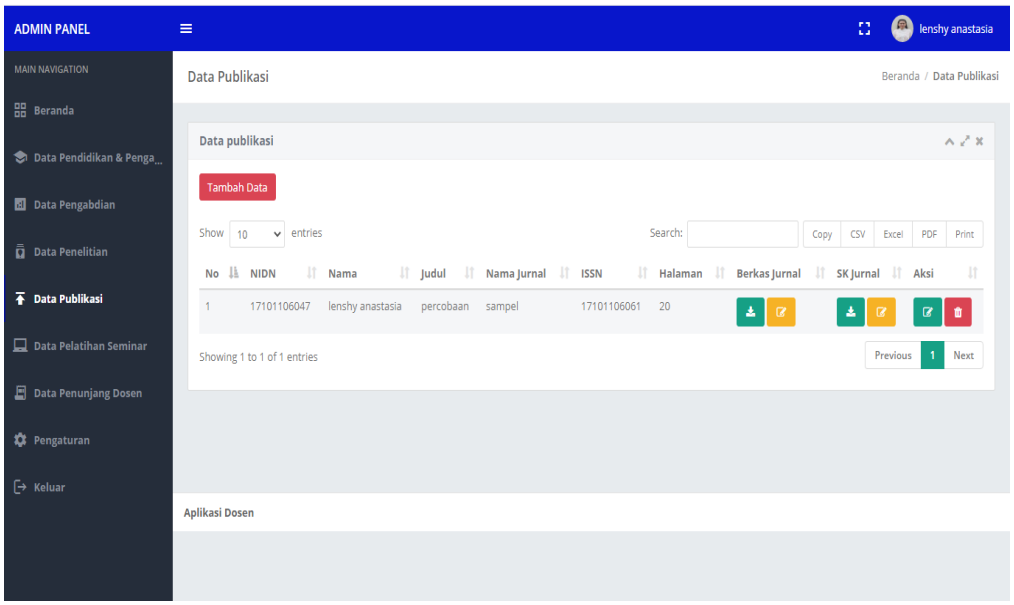

Figure 16. Publication Data

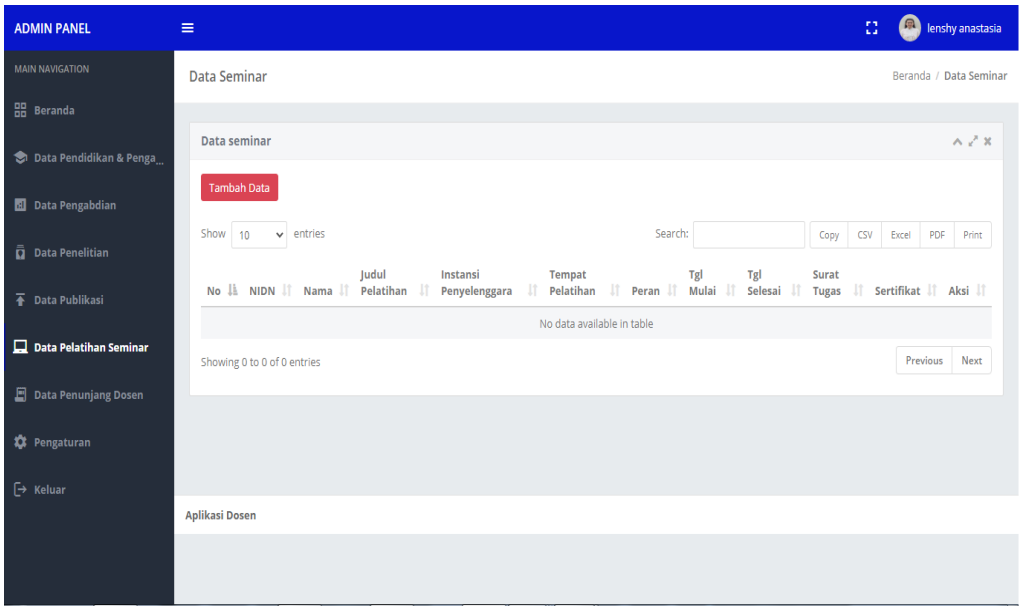

Figure 17. Seminar Training Data

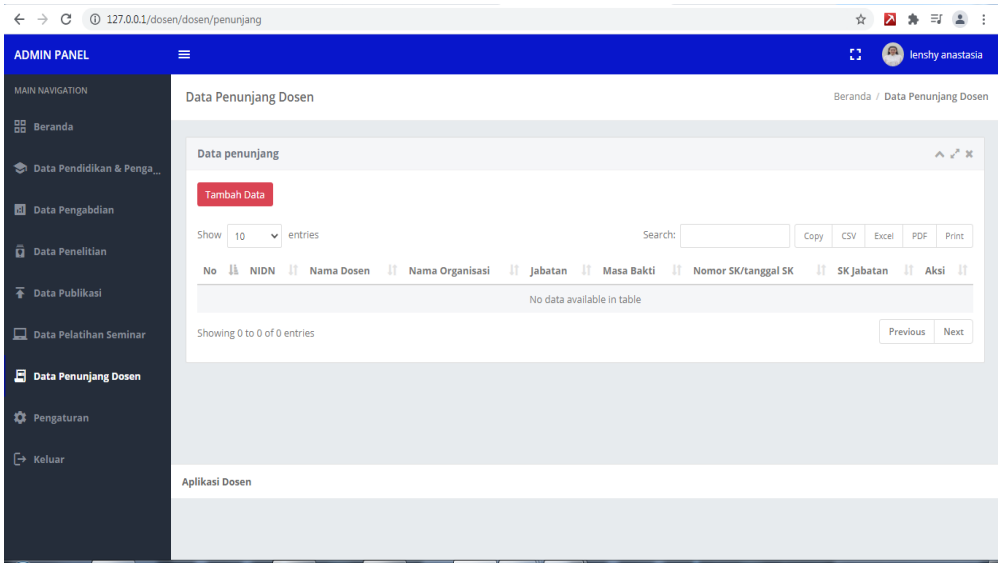

Figure 18. Lecturer Supporting Data

The display of data input from each menu is almost the same. Input page above serves to manage lecturer data such as add, edit, delete and store lecturer data in the various format such as csv, excel, or pdf according to lecturer data. There is also an option to copy or print the data. The data could be input by click the red button on the top left as shown on the image above.

5. Conclusion

From the result and discussion related to the design web-based information system of tri dharma higher education for lecturer, it can be concluded this system was created to assist lecturer to process the data quickly and easily in reducing the risk of the failure data. By using the internet, lecturer can be more extensive and easier to manage the required data quickly and precisely, especially in updating the lecturer data.

Acknowledgments

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