Implementation of a Web-Based Academic and Non-Academic Achievement Information System at the Student Affairs and Alumni Office of Universitas Muhammadiyah Sumatera Utara Using the Rapid Application Development (RAD) Method

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ABSTRACT

This research discusses the implementation of a web-based academic and non-academic achievement information system at the Student Affairs and Alumni Office of Universitas Muhammadiyah Sumatera Utara. The system is designed to address issues in managing student achievement data, which was previously handled manually, often resulting in data inaccuracies, delayed reporting, and a lack of convenience in accurately monitoring student achievements. Using the Rapid Application Development (RAD) methodology, the system development is conducted quickly and iteratively through planning, design, and prototype construction phases that allow users to test it directly. RAD was chosen because it enables results that meet user needs in a relatively short time and facilitates adjustments throughout the development process. This information system allows the student affairs office to record, process, and report student achievement data more efficiently. Additionally, the system includes features for searching and tracking achievements, assisting the university in analyzing and evaluating student accomplishments in both academic and non-academic areas. The results of this research show that the developed system can provide accurate, real-time data and contributes to the improvement of service quality at the Student Affairs and Alumni Office. It is expected that this system will enable more transparent, effective student achievement data management and support the enhancement of graduate quality.

Keyword : Information System, Student Achievement, Web, Rapid Application Development (RAD), Student Affairs Office

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1. INTRODUCTION

Muhammadiyah University of North Sumatra (UMSU) is one of the Private Universities in Medan, North Sumatra. UMSU is one of the best campuses in Medan, North Sumatra, both in terms of Achievement and the number of students. Under the leadership of Rector Prof. Dr. Agussani, M.AP. UMSU has succeeded in achieving the peak of its achievements by achieving Accreditation A, in addition UMSU also has 9 Study Programs that have been accredited A, making this University the first University on the island of Sumatra to be accredited as an Excellent institution. UMSU also recorded many student achievements at the regional, national and international levels in the fields of sports, arts and culture, qori, and research and community service. Many students have achieved in various things. This is important to make the Muhammadiyah University of North Sumatra proud and advance the good name of the university because the achievements obtained prove that students have talents in various fields outside the study program. Each achievement is recorded and stored in the campus database as proof of achievements that have been obtained. The problem that occurs is that the Muhammadiyah University of North Sumatra still uses the MS application. Excel to manage academic and non-academic achievement data so that it requires many storage files and the difficulty in finding data and printing reports. Therefore, a method is needed that can help the University of Muhammadiyah North Sumatra in facilitating the management of academic and non-academic achievement data.

The use of computers helps the performance of many people in various matters regarding information management. Therefore, researchers utilize the use of computers to help the University of Muhammadiyah North Sumatra in creating an application for an academic and non-academic achievement information system. However, a method is needed that can provide good stages in creating an information system application.

Based on research conducted by Fergina et al (2023) regarding the Implementation of an Academic Information System Applying the Rapid Application Development Method, it was concluded that with this application, students have easy access to information related to their attendance, subjects, and grades. On the other hand, teachers will also benefit from this application by getting information related to attendance, teaching schedules, and the ability to provide grades and school assignments online. This application will provide convenience and efficiency in managing academic information for both students and teachers.

Based on research conducted by Arafat (2022) Designing an Academic Information System Using the Rapid Application Development (Rad) Method Based on the Web (Case Study of SMP Gemilang Modernland) it was concluded that by building an academic information system at SMP Gemilang Modernland, the process of recording student data, teachers, assessments, and subject schedules can be automated, facilitating management and fast access to information. This system allows schools to increase efficiency and accuracy in managing data that is very important in daily operations.

From several previous studies that have successfully used the Rapid Application Development (RAD) method in information system applications, the researcher used Rapid Application Development (RAD) for academic and non-academic information systems. RAD is a system development method that adopts a prototyping approach with the aim of creating a high-quality system quickly and at a lower cost. The purpose of using the RAD method in system development is to accelerate development, actively involve end users, face change with flexibility, reduce risk, and save costs and time. RAD emphasizes the development cycle in a limited time. and is an important limitation in this model. The rapid application development method uses an iterative approach in building a system, where a functioning system model is built in the early stages of development to determine user needs, and then the model will be deleted. (Fergina et al., 2023). With the existence of academic and non-academic information systems, it can facilitate data management from MS. Excel applications.

2. RESEARCH METHOD

The environment used to develop programs includes the type of software used, the operating system used and the type of computer used. The type of software used to create the Web-Based Academic and Non-Academic Achievement Information System Implementation Application at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra Using the Rapid Application Development (RAD) Method, namely Browser Web, Notepad++, Appserv, MS. Word, MS. Excel. The operating system used to run the Web-Based Academic and Non-Academic Achievement Information System Implementation Application at the Student and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method is Windows. The type of computer used to run the Web-Based Academic and Non-Academic Achievement Information System Implementation Application at the Student and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method is a laptop with the following specifications: a minimum Intel processor, minimum 4GB RAM, and a minimum 80GB hard disk. The data structure used is Unified Modeling Language modeling and creating tables for data processing media.

3. RESULTS AND DISCUSSION

A. Results

The results of the implementation of the Web-Based Academic and Non-Academic Achievement Information System at the Student Affairs and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method can be seen as follows:

1. Login Form

   The login form for the implementation of a web-based academic and non-academic achievement information system at the Student and Alumni Bureau of the University of

Muhammadiyah North Sumatra using the Rapid Application Development (RAD) method can be seen in in Figure 1.

2. Home Form

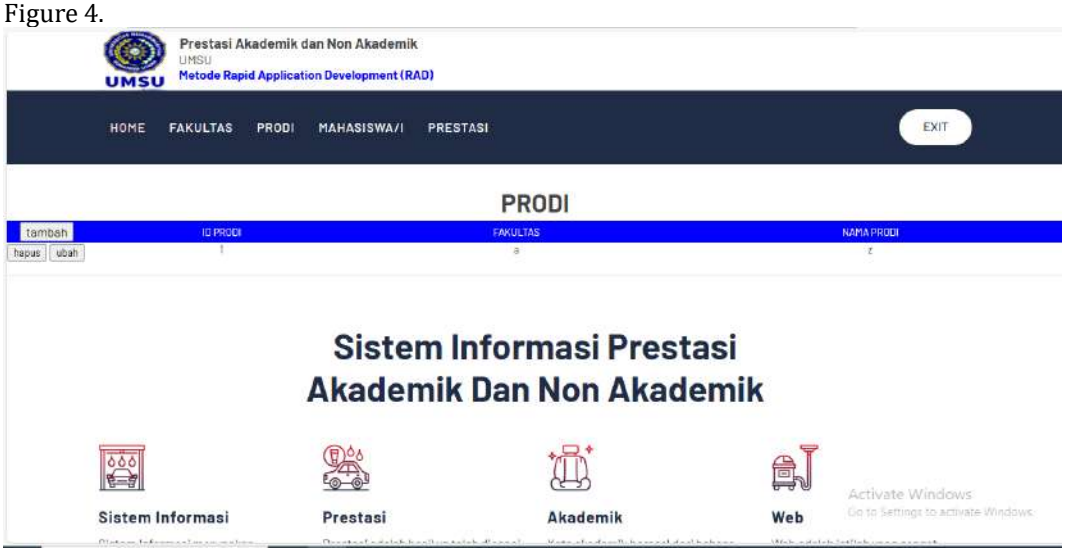
The Home Form of the Implementation of a Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 2.

3. Faculty Form

Faculty Form of the Implementation of Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 3.

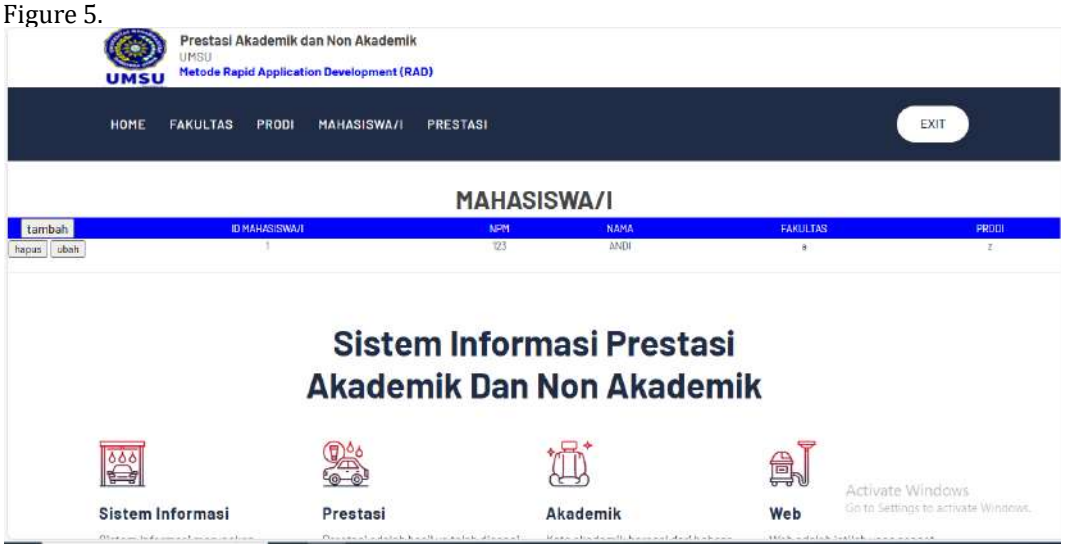
4. Study Program Form

Study Program Form from the Implementation of Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 4.



5. Student Form

Student Form from the Implementation of the Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 5.

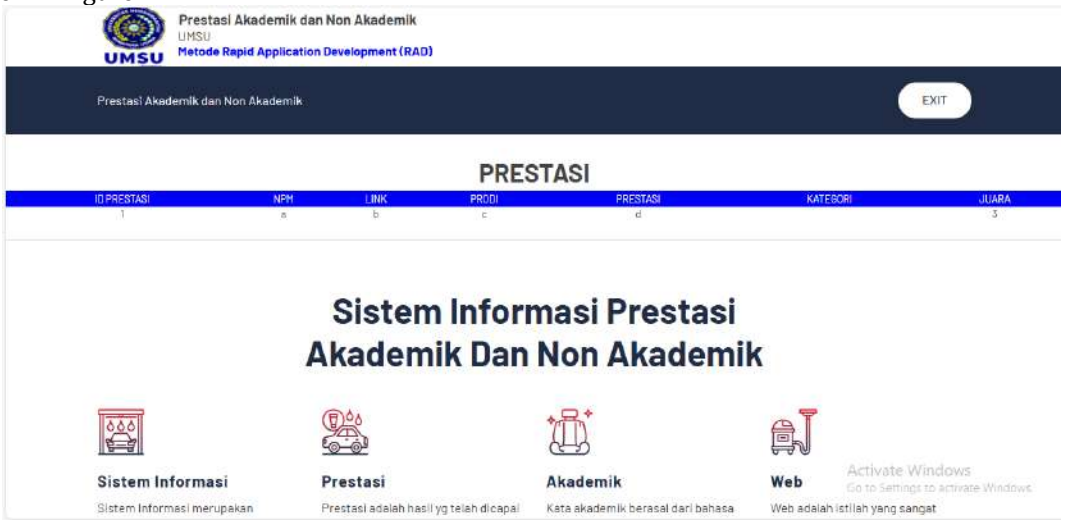


6. Achievement Form

The Achievement Form from the Implementation of the Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 6.

7. User Achievement Form

User Achievement Form from the Implementation of Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method can be seen in Figure 7.



B. Discussion

The discussion includes device requirements, results used and testing in this study.

1. Device Requirements

The hardware and software requirements for creating the application are as follows:

a. One laptop unit with the following specifications:
   1) Minimum Core 2 Duo Processor
   2) Minimum 1 GB RAM
   3) Minimum 80 GB Hardisk
b. Software with the following specifications:
   1) Windows Operating System
   2) Notepad++
   3) Appserv

2. Rapid Application Development (RAD) Method

This research uses the Rapid Application Development (RAD) method which is used as a stage in completing the research.

3. Program Trial

The system test aims to ensure that the system is ready to use. The instrument used to conduct this test is by using Blackbox Testing:

Login Form Blackbox Testing

No	Login Form	Description	Validity
1.	Click the Submit Button	The application displays a menu form	Valid

Home Form Blackbox Testing

No	Home Form	Description	Validity
1.	Click the Home button	The application displays the home form	Valid
2.	Click the Faculty button	The application displays the Faculty form	Valid
3.	Click the Study Program button	The application displays the study program form	Valid
4.	Click the Student button	The application displays the student form	Valid
5.	Click the Achievement button	The application displays the achievement form	Valid
6.	Click the User Achievement button	The application displays the user achievement form	Valid

Faculty Form Blackbox Testing

No	Faculty Form	Description	Validity
1.	Click the Save button	The application saves all data in the textbox into a database table	Valid
2.	Click the Change button	The application changes the contents of the database table according to the changed data	Valid
3.	Click the Delete button	The application deletes the contents of the data in the database	

Study Program Form Blackbox Testing

No	Study Program Form	Description	Validity
1.	Click the Save button	The application saves all data in the textbox into a database table	Valid
2.	Click the Change button	The application changes the contents of the database table according to the changed data	Valid
3.	Click the Delete button	The application deletes the contents of the data in the database	

Student Form Blackbox Testing

No	Student Form	Description	Validity
1.	Click the Save button	The application saves all data in the textbox into a database table	Valid
2.	Click the Change button	The application changes the contents of the database table according to the changed data	Valid

3.	Click the Delete button	The application deletes the contents of the data in the database	

Achievement Form Blackbox Testing

No	Achievement Form	Description	Validity
1.	Click the Save button	The application saves all data in the textbox into a database table	Valid
2.	Click the Change button	The application changes the contents of the database table according to the changed data	Valid
3.	Click the Delete button	The application deletes the contents of the data in the database	

User Achievement Form Blackbox Testing

No	User Achievement Form	Description	Validity
1.	Click the Exit button	The application closes the user's achievement form and displays the login form	Valid

C. Trial Results

After conducting a trial on the system, it can be concluded that the results obtained are:

1. The design interface is in accordance with the resulting interface.
2. The Decision Tree method has been applied to the application created.
3. The application interface is user friendly so that users can use it easily.
4. The application that has been created runs well.
5. The application that has been created does not have any logical errors.

D. Application Disadvantages

The shortcomings of the application in this study include:

1. The application that has been created does not use the decision search method.
2. The application that has been created requires complete achievement data.
3. The application is still implemented locally.

4. CONCLUSION

The conclusion of the implementation of the web-based academic and non-academic achievement information system at the Student and Alumni Bureau of the Muhammadiyah University of North Sumatra using the Rapid Application Development (RAD) method is by using the Rapid Application Development (RAD) method, the stages of application creation can be clearly seen. By using study program data, faculty data, and student data, the Rapid Application Development (RAD) method can be applied to information system applications. By using web programming, it can produce the Implementation of a Web-Based Academic and Non-Academic Achievement Information System at the Student and Alumni Bureau of the University of Muhammadiyah North Sumatra Using the Rapid Application Development (RAD) Method.

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