



Web-Based Academic Information System Design at Praktisi Polytechnic

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Abstract

This study aims to design an academic information system. The method used in this study uses observation on the object of research and answers. It conducts an assessment of the literature while for the description of the information system using an object-oriented depiction method with UML tools. The waterfall is used as a software development method. The PHP programming language is a programming language and database Mysql. Based tests on academic information systems at practitioner polytechnics can be used properly and effectively, making it easier for users to carry out academic administrative processing.

Keywords: Information system, Academic, Web, PHP, MySQL

Abstrak

Penelitian ini bertujuan untuk merancang sebuah sistem informasi akademik. Metode yang digunakan dalam penelitian ini menggunakan observasi terhadap objek penelitian dan melakukan pengkajian literatur, sedangkan untuk deskripsi sistem informasinya menggunakan metode penggambaran berorientasi objek dengan tools UML, software yang digunakan adalah Waterfall. metode pengembangan. serta bahasa pemrograman PHP sebagai bahasa pemrograman dan database Mysql, berdasarkan pengujian yang dilakukan sistem informasi akademik pada politeknik praktisi dapat digunakan dengan baik dan efektif, selain itu memudahkan pengguna dalam melakukan proses administrasi akademik.

Kata-kata kunci: Sistem informasi, Akademik, Web, PHP, MySQL



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1. Introduction

Current technological developments are developing very rapidly and can even be said never to end, and this makes all organizations compete to build towards the latest technology. It is done not only because of technological developments but also based on the need for service to customers or users of the service [1].

Universities are required to produce professional resources by the demands of the business and industrial world. Therefore, a system is needed to manage academics which is one of the crucial components. It is currently developing technology that is expected to support information management in academic management [5].

Information systems influence the direction of every process or rule within the organization, so the role of information systems is crucial in existing organizational processes [7].

Currently, academics practicing polytechnics use a manual system or use physical records. So that in practice, there are obstacles in the form of inaccurate data input so that the information obtained is different from what is expected. Besides, the time needed to obtain information is relatively long because the data needs to be integrated [10].

Due to the problems mentioned, in addition to technological developments and problems in the academic system, the authors conducted a study entitled Designing a web-based educational information system at a practicing polytechnic.

2. Method

For each study, use the method in its preparation so that the research results can be directed according to the research objectives [8].

In this study, the authors used the waterfall software development method, which is relatively easy to develop, where each stage depends on the previous stage. It means that the next stage can be carried out after the previous stage has been carried out [3]; besides that, in practice, the author carries out activities according to the stages contained in the method are the stages of software development as shown in figure 1 below [9]:

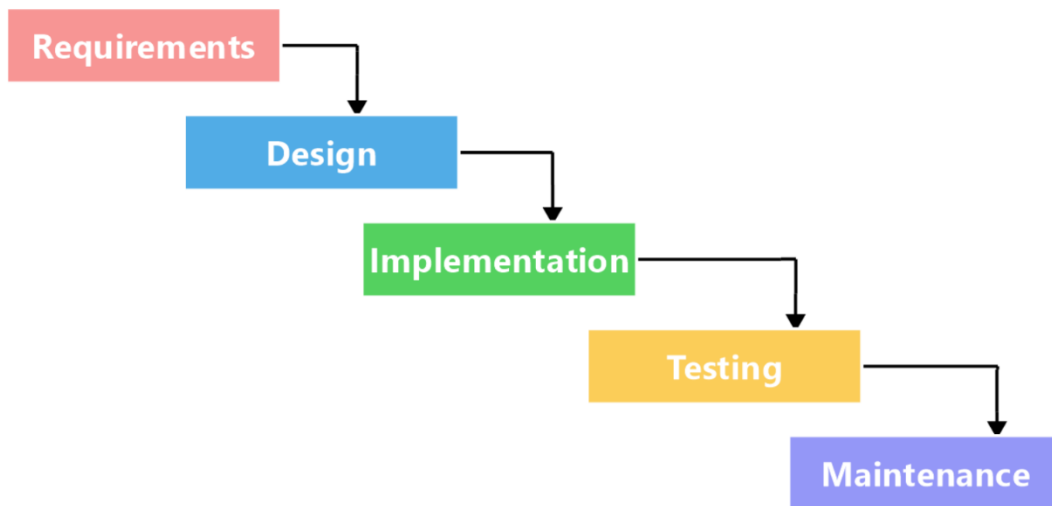


Figure 1. Waterfall Method

From these stages, the author carries out activities in sequence, as shown in **Table 1**:

Table 1. Research Activity

No	Stages	Activities
1	Needs Analysis	<p>The author makes observations in the form of interviews and sees directly the processes that occur in the field where the processes that are observed are:</p> <ol style="list-style-type: none"> a. Master data consisting of students, courses, and lecturers b. Transaction data are consisting of lectures, academic guidance, lecture minutes, and filling in value data c. Reports generated from the entered master data and transactions contained in the academic system
2	System Desain	<p>The author describes the system design in the form of a business process using an object approach, namely using the UML [2] model, while the diagrams created or described consist of:</p> <ol style="list-style-type: none"> a. Use case diagram where in this diagram illustrates master data management in the form of lecturers, students and courses as well as management of transactions, namely academic guidance lectures and filling in grades [6]. b. Activity Diagram in this diagram describes the business process of master data management activities in the form of students, lecturers and courses, lecture management, final project guidance and course grade management [6].

		c. A class Diagram is used to describe the data requirements in the system as a basis for database development [6].
3	Program Code Writing	In this stage, the author writes the program using a web-based programming language where the front-end programming language is used, namely HTML and CSS. The backend uses the PHP programming language and MySQL for data storage [1]. The program code manages master data from lecturers, students and academics. Besides that, a program code is also made to manage lectures, academic guidance and management of grades.
4	System Testing	In testing, the author tested using the blackbox method where this method was used to carry out functional testing of the system [4], besides that testing was carried out on the management system of lecturers, students, courses, lectures, academic guidance and assessment
5	System Implementation	After testing and getting the results everything goes according to the desired criteria [3], then it is implemented in an academic environment by installing the system on the computer that has been prepared according to the needs and network connection so that the system can be used on the client computer.

3. Results and Discussion

The author writes down into three parts the results of the research in the form of system design, implementation results and system testing where these three points are the results of the stages in system development.

a. Desain System

To describe the system that is designed the author uses an object-oriented approach and uses UML as a tool used to describe system design where the diagrams are Use Case diagrams, Activity Diagrams and Class diagrams, where Usecase and Activity are used to describe the business processes of the system while class diagrams used to describe the need for data contained in the system that is designed [2].

1) Use Case Diagram

In a system designed, use case diagrams are used to describe the business processes that occur in the system where the business process in question describes more deeply the activities of the actors in the system [2]. The following is **Figure 2** about the use case diagram:

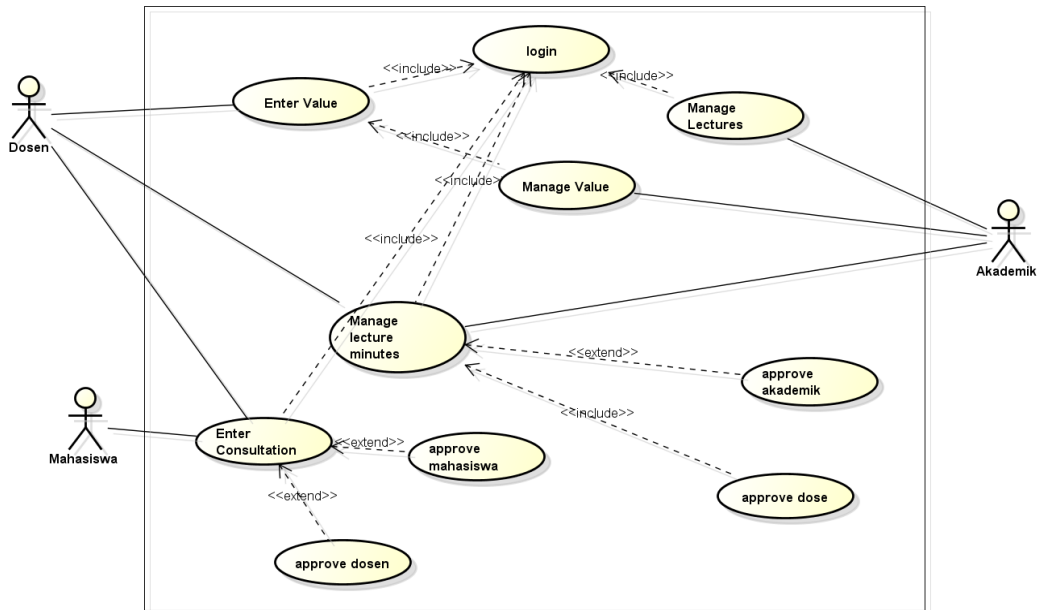


Figure 2. Use Case Diagram

2) Academic Consulting Activity Diagram

The activity in the diagram is management regarding academic guidance, which involves two parts: lecturers and students. The following is **Figure 3** about the academic consulting activity diagram:

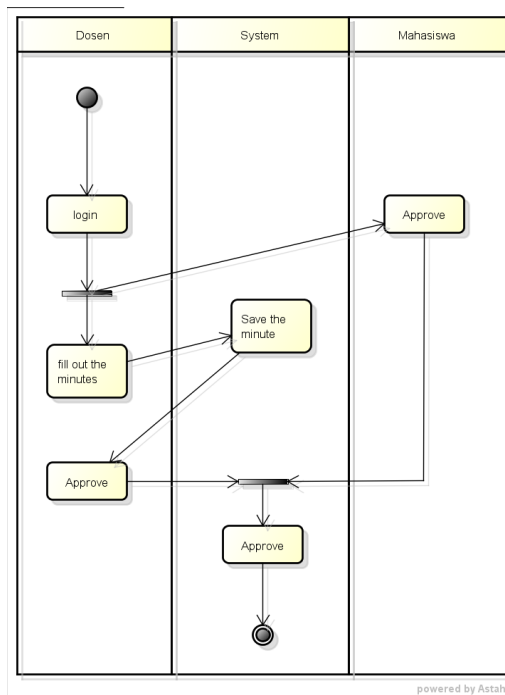


Figure 3. Academic Consulting Activity Diagram

3) Minutes of the lecture activity diagram

The activity carried out in the diagram is the management of lecture news. This system will run after the lecturer has finished conducting lectures with students, which involve two parts: lecturers and academics. The following is **Figure 4** about minutes of the lecture activity diagram:

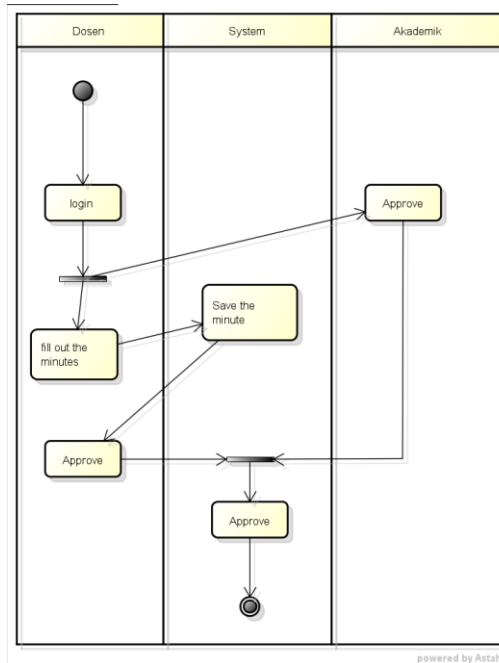


Figure 4. Minutes of the lecture activity diagram

4) Lecture grades activity diagram

The activity of entering values is an activity that describes the business process for entering values. The activity is carried out by the lecturer, where the lecturer enters values after first logging in. The activities are entering values into the system, changing data and deleting previously stored data [6]. The following is **Figure 5** about the lecture grades activity diagram:

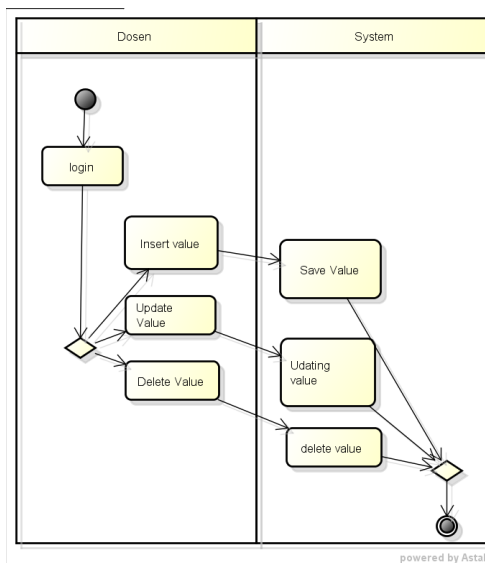


Figure 5. Lecture grades activity diagram

5) Class Diagram

Class diagrams are used as a description of the data requirements that exist in the system where the description can be seen in the following **Figure 6**:

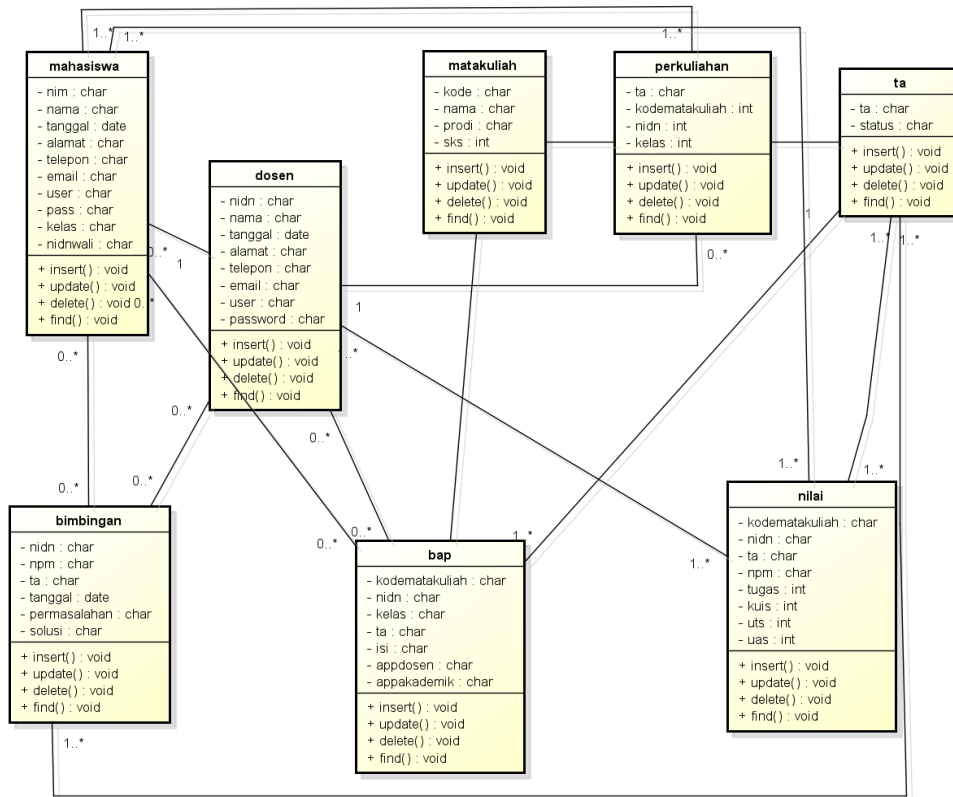


Figure 6. Class Diagram

b. Implementation System

In designing the system, the author refers to the analysis of the designed system, which in addition to designing the interface, also makes programs by entering code and connecting and manipulating data into the database according to the system design that has been done before [3].

The initial display is the login form display which is used as validation for users who can use the system by entering a user in the form of an NPM, NIDN or NIP and a password, as shown in **Figure 7**:

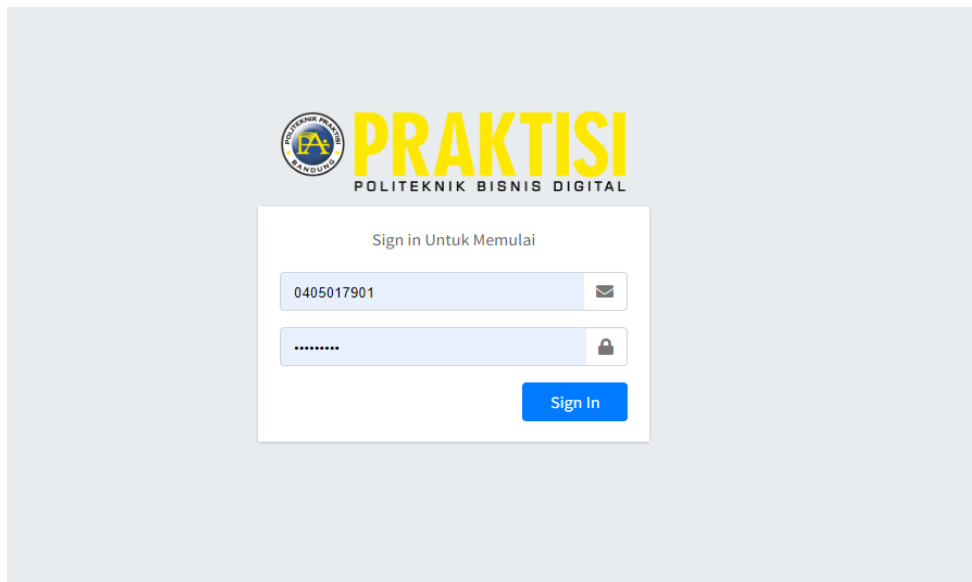


Figure 7. Login Form

The main menu is the initial display used to access existing facilities in the information system, such as Figure 8 for lecturers, Figure 9 for students and Figure 10 for academics.

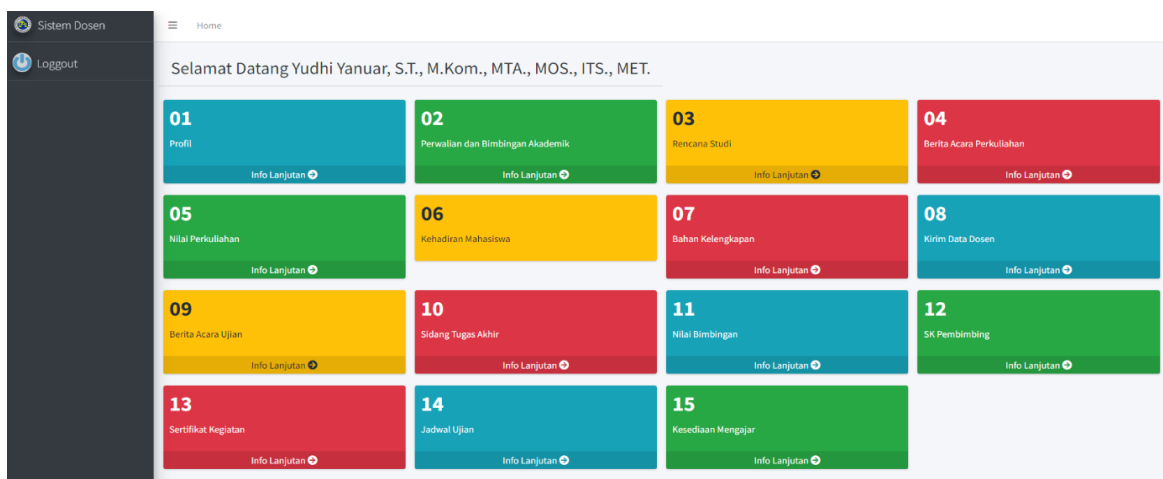


Figure 8. Lectures Menu

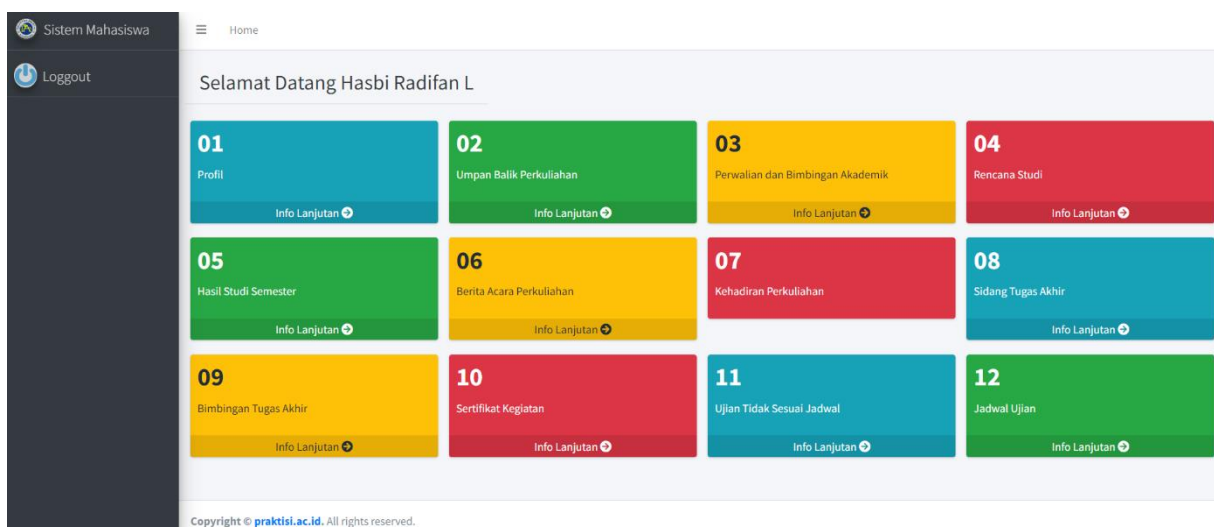


Figure 9. Students Menu

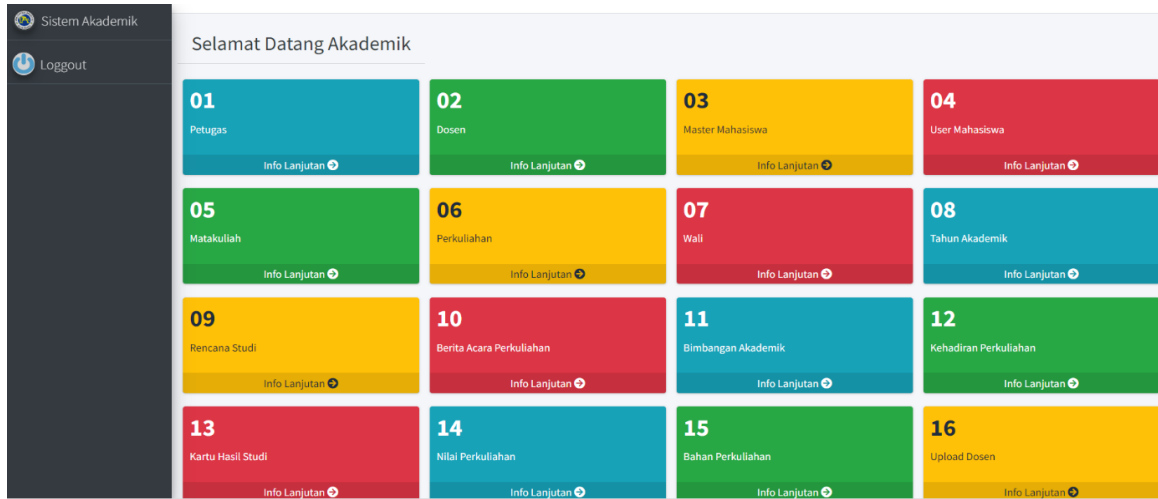


Figure 10. Academics Menu

In the academic guidance menu, there will be 2 parts, namely input regarding the guidance process as shown in Figure 11 and a list of guidance as shown in Figure 12.

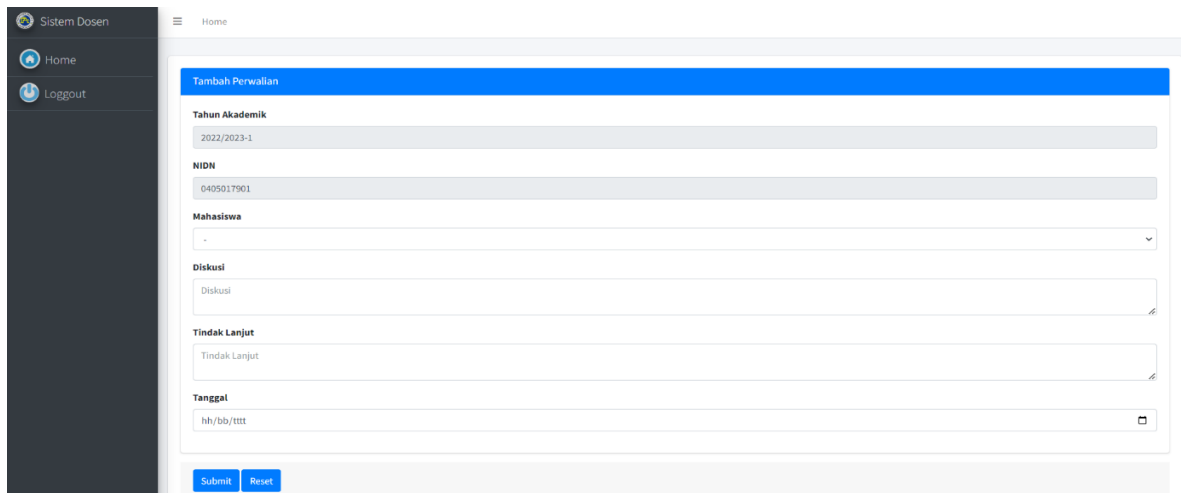


Figure 11. Input Regarding the Guidance

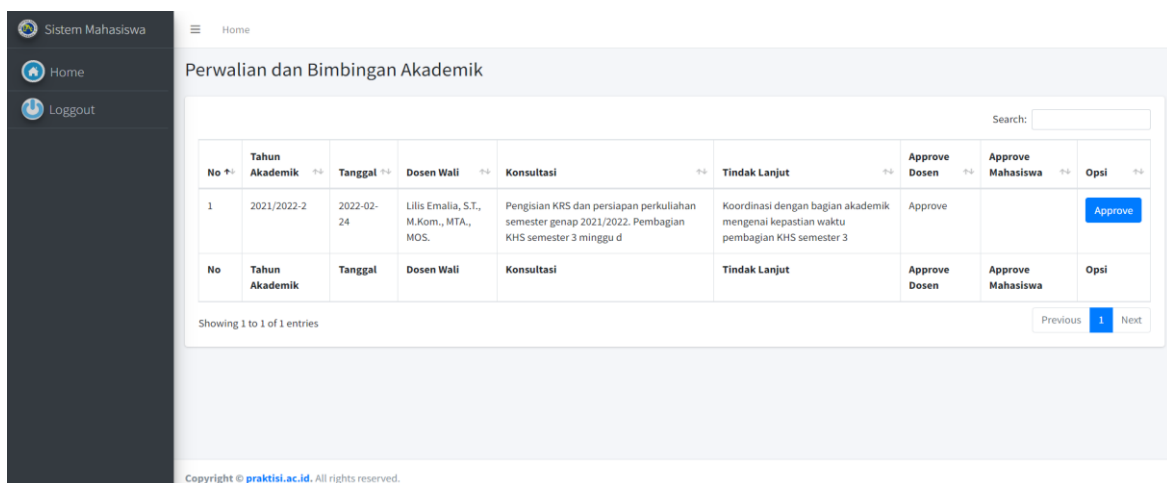


Figure 12. List Regarding The Guidance

In the agenda filling menu there are two facilities, namely inputting as shown in **Figure 13** and a list of minutes as shown in **Figure 14**:

Figure 13. Input Minute of Lectures

No	Tahun Akademik	Tanggal	Pertemuan	Kode Matakuliah	Nama Matakuliah	Berita Acara	Approve Dosen	Approve Akademik	Kelas	File	Opsi
1	2022/2023-1	2022-08-04	1	MIV03	Pemrograman Perangkat Bergerak	Pendahuluan : pengenalan teknologi mobile	Approve		MIV023		Hapus, Cetak
2	2022/2023-1	2022-08-11	2	MIV03	Pemrograman Perangkat Bergerak	Pengertian Aplikasi Bergerak dan Pembuatan Aplikasi Profile	Approve		MIV023		Hapus, Cetak
3	2022/2023-1	2022-08-16	3	MIV03	Pemrograman Perangkat Bergerak	Proses Pemilihan dalam Mobile Programming	Approve		MIV023		Hapus, Cetak
4	2022/2023-1	2022-08-25	4	MIV03	Pemrograman Perangkat Bergerak	Pemilihan dalam Pemrograman Mobile	Approve		MIV023		Hapus, Cetak

Figure 14. List Minute of Lectures

Then the value input is shown in **Figure 15** and the list of grades is shown in **Figure 16**:

No	Tahun Akademik	Semester	Nama Matakuliah	NPM	Nama Mahasiswa	Kuis	Tugas	UTS	UAS	Opsi
1	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223025	JATMIKO SATRIO BAGUS KUNCORO	100 100	100 100	80 80	100 100	Tambah
2	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223001	FAUZAN NAUFAL NUR RAMADHANI	100 100	100 100	100 100	100 100	Tambah
3	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223002	HASBI RADIFAN L	100 100	80 80	80 80	100 100	Tambah
4	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223003	HAGI AHMAD FIRDAUS	100 100	100 100	90 90	100 100	Tambah
5	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223004	DHEAN ARYANDI	100 100	100 100	90 90	100 100	Tambah
6	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223005	DIKKI DAKYUDIN	60 60	80 80	80 80	100 100	Tambah
7	2022/2023-1	5	Pemrograman Perangkat Bergerak	0223006	RIDWAN YUSUF RIFALDI	90 90	100 100	100 100	100 100	Tambah

Figure 15. Input Grade of Course

No	Tahun Akademik	Kode Matakuliah	Nama Matakuliah	Kelas	Opsi
1	2022/2023-1	MIW03	Pemrograman Perangkat Bergerak	MI2023	Input Nilai, Cetak Daftar Nilai, Generate Komponen
2	2022/2023-1	MIH04	Perancangan Basisdata	MI2024K	Generate
3	2022/2023-1	MIH04	Perancangan Basisdata	MBD2024K	Generate
4	2022/2023-1	MIH01	Pemrograman Web Dasar	MI2024R	Input Nilai, Cetak Daftar Nilai, Generate Komponen
5	2022/2023-1	MIH01	Pemrograman Web Dasar	MBD2024R	Input Nilai, Cetak Daftar Nilai, Generate Komponen
6	2022/2023-1	2213	Praktikum Pemrograman Web Dasar	MI2024R	Generate
7	2022/2023-1	MIH01	Pemrograman Web Dasar	MI2024K	Generate
8	2022/2023-1	MIH01	Pemrograman Web Dasar	MBD2024K	Generate
9	2022/2023-1	2213	Praktikum Pemrograman Web Dasar	MI2024R	Generate

Figure 16. List Grade of Course

c. System Test

The next stage in this research is to test the system that has been made [4], where the test process is carried out on logins, academic guidance, lecture minutes and lecture grades.

1) Login Form Testing

Testing the login form, we can find out whether the test results of the system are as expected or not, as shown in Table 2 below:

Table 2. Testing Login Form

Description of Testing	Expected Results	Observation Result
User enters the correct username and password	The system will display the main menu	Sukses
User enters the wrong username and password	The system will display an error message and return to the login screen	Sukses

Next test a test was carried out regarding the management of academic guidance as shown in Table 3.

Table 3. Testing Management of Academic Guidance Form

Description of Testing	Expected Results	Observation Result
Enter guidance data according to the attributes in the form display	The data included in academic guidance can be done well	Sukses
Enter guidance data that does not match the attributes in the form display	The system will refuse data storage	Sukses
The lecturer approves the guidance	The system will save the approval made by the lecturer	Sukses
Students approve the results of academic guidance	The system will save the approval made by students	Sukses

In testing the system for inputting lecture minutes can be seen in [Table 4](#).

Table 4. Testing Lecture Minute Form

Description of Testing	Expected Results	Observasion Result
Enter lecture minute data to the attributes in the form display	The data included in lecture minute can be done well	Succes
Enter lecture minute data that does not match the attributes in the form display	The system will refuse data storage	Succes
The lecturer approves in lecture minute form	The system will save the approval made by the lecturer	Succes
Academic approve the results of lecture minute form	The system will save the approval made by academic	Sukses

The test results on the lecture value filling form are shown in [Table 5](#):

Table 5. lecture value filling form

Description of Testing	Expected Results	Observasion Result
Lecturer enters grade according to the attributes on the form	System will store and calculate the final value	Succes
The lecturer agrees on the final result	System will refuse data storage	Succes
Academic approve final results	The system will save the approval made by academic	Sukses
Students see the results of the final grade	System will display final result	Sukses

4. Conclusion

The conclusion of this study is that the academic information system design is running well and no errors were found in its operation.

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