Inside | Jurnal Sistem Informatika Cerdas

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Implementation and Testing System Information Academic (SIAKAD) In New University XYZ

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Abstract

Technological developments that are increasing each year rapidly in various fields have contributed to encouraging tertiary institutions to remain superior and carry out all fields quickly and efficiently by utilizing digital technology. Indicators of technological development in tertiary institutions have adequate information technology infrastructure. One of the tertiary information technology infrastructures has an academic information system governance (SIAKAD) in managing the educational management process at the tertiary institution. Universities that have just been established generally do not have SIAKAD in their academic management process, one of which is XYZ University. XYZ University in carrying out the process of academic activities is still done manually resulting in less effective and efficient activity processes. Then the condition of the COVID-19 pandemic requires students to do remote or online learning. Therefore the author makes SIAKAD which will be tested on users so that the system built can suit their needs. Of the 15 respondents, a questionnaire test was carried out which resulted in a user satisfaction value of 76.83% which showed reasonable satisfaction by the user. Based on the results of the test, it was found that the use of SIAKAD in tertiary institutions is very helpful in the academic process.

Keywords : system information academic, university, technology information

1 INTRODUCTION

Information technology has made tremendous progress in the last few decades. This also influences the development of information technology in the field of information systems in the world of education, especially in universities [1]. The need for information systems in tertiary institutions is a priority in line with ongoing academic activities. The use of information systems is very important in the academic process so that the academic process becomes more efficient and effective than using manual / traditional [2]. Universities that cannot keep up with existing technological developments will be displaced and unable to compete with other tertiary institutions.

In 2020 we are facing the COVID-19 pandemic which has hit various sectors, both the economy and education [3]. New lifestyle changes due to the pandemic have also changed teaching and learning activities in the world of education. Policies that require all activities to be carried out boldly require educational institution administrators to prepare effective supporting facilities in terms of digital infrastructure. Under these conditions, higher education institutions are required to apply the use of digital technology in dealing with these problems. Newly established tertiary institutions generally do not have an academic information system, one of which is XYZ University.

The information system needed must be able to bridge all information related to campus academic activities such as academic processes, KHS students, student data management, presentation of teaching and learning activities. In addition, the application of information systems helps in increasing the added value of higher education in promotion events and competing with other campuses.

With the above background, the author implements and tests an academic information system or SIAKAD at XYZ University using the PHP 7 programming language and the CodeIgniter framework. The results of the system that has been created will be tested by questionnaire to student correspondence regarding user satisfaction regarding the use of academic information systems. The expected results of the information system that is built can have a positive impact and function for XYZ college

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2 RESEARCH METHOD

In this research, the design of an academic information system uses the Waterfall method. The waterfall method is a system development method with a focus on a sequential and systematic approach. Stages of the Waterfall Method [4]:

2.1 *Requirements analysis and definition*

Analysis of the needs of the system that will be designed to produce the goals and functions as expected

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2.2 *System and software design*

The stages are carried out by designing the system to be built by looking at the needs of the system that has been obtained from the previous stage. This stage involves an overview of the design that will be done.

2.3 *Implementation and unit testing*

This stage is carried out by implementing the system according to the design that was made before. This implementation can be done by coding the application.

2.4 *Integration and system testing*

The system will be tested first on the user to verify the function is running the same as expected

2.4 *Operation and Maintance*

The final stage of the waterfall method is to perform maintenance on the system that has been created. The maintenance referred to is updating or repairing if the system experiences an error or error. Figure 1 shows the stages of the Waterfal method.

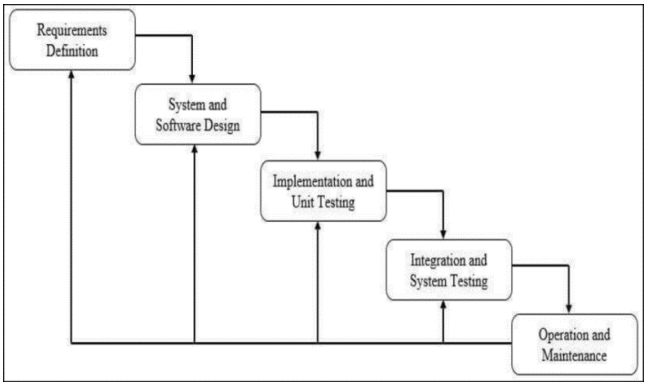

Fig 1. Waterfal Method

3 RESULTS AND ANALYSIS

By using the waterfall method as a method of developing SIAKAD. Then the results and discussion are obtained as follows:

3.1 *Requirements analysis and definition*

Analysis and search for system requirements is carried out. Obtained problems, supporting data requirements, functional and non-functional requirements

3.1.1 *Problem's*

- Students have difficulty taking KHS because they have to come to campus to take KHS
- Processing of student grades is slow because the process is still manual
- Attendance or attendance of students who are still manual (recorded by the lecturer concerned) during the COVID-19 period
- Information and announcements related to academics are still provided in the student WhatsApp group
- There are no student digital data storage facilities for academic purposes, so it takes a long time to search for student data

3.1.2 *Data Support's*

Supporting data in the academic information system include: student data, lecturer da ta, student KHS scores, announcement data and information, class schedules, file upload data, types of payments, study program data, room data, academic year data, batch data and lecturer data. Next, functional and functional requirements analysis is needed to determine the system requirements to be built. This requirement is very important to test the system running according to its purpose [5]

3.1.3 *Functional*

- Login process by users (students, lecturers and administrators)
- View announcements and other information (students, lecturers and administrators)
- Upload the required files (students, lecturers and administrators)
- User data management (administrator)
- Department data management, class year and room (administrator)
- Management of class schedule data, courses and lecture absences and KHS students (administrators)
- Management of announcements and other information (administrator)
- Input student (lecturer) grades
- Print KHS students (administrators and students)

3.1.4 *Non-Functional*

- The system only provides one language, namely Indonesian
- The system can be used in various places (websites)
- System can save previous data
- All symbols that have not been mentioned in the equation should be explained in the following text.

3.2 *System and Software Design*

This stage performs architectural design according to the system requirements that have been obtained previously

3.2.1 *Use Case*

Use cases are units that carry out functionality to exchange messages from one unit to a particular unit [6]. Figure 3 explains the SIAKAD use case

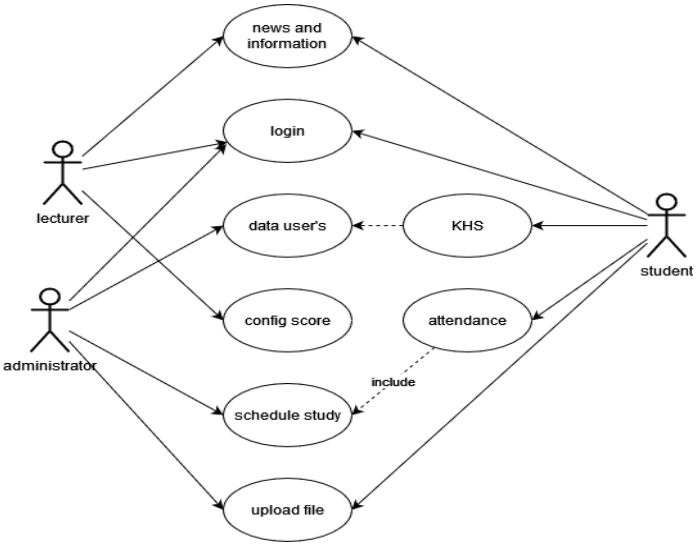

Fig 2. Use case SIAKAD

3.2.2 *Sequence Diagram*

Sequence diagrams are communication between diagrams that show messages from a certain time (Booch, 2005). Figure 4 explains the Student KHS Sequence Diagram :

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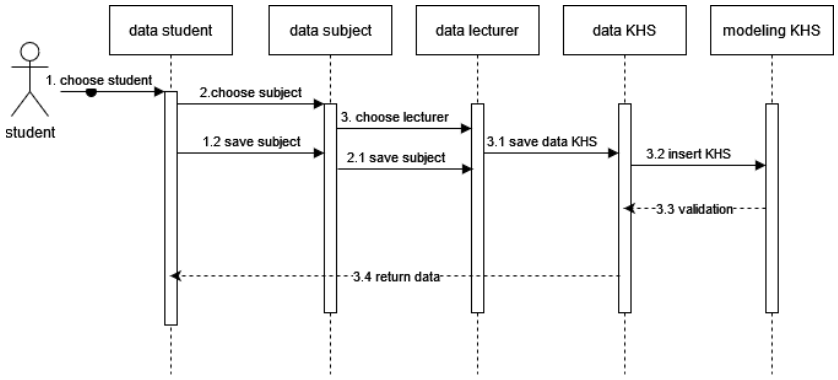


Fig 3. Sequence Diagram

3.2.3 *Class Diagram*

The class diagram is a class structure in the database that describes the creation of an academic information system [7]. Figure 6 describes an overview of the SIAKAD Class Diagram :

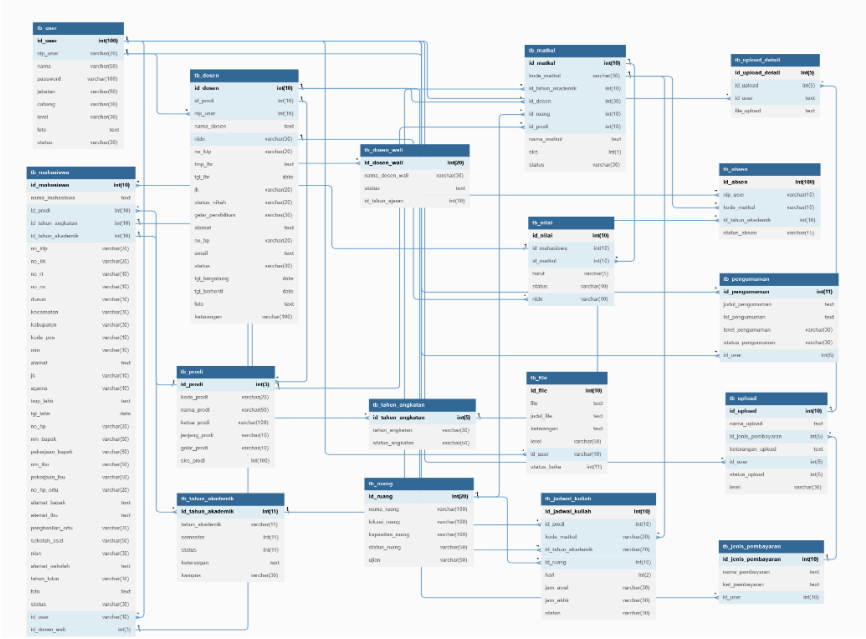


Fig 4. Class diagram

3.3 *Implementation and unit testing*

At this stage, the coding of the website program uses the programming languages PHP, Javascript, CSS, MySQL and the CodeIgniter 3 framework. The reason for using this programming language and framework is that it is easy to develop further. Codeigniter users also make the TIM program work easier. In the following, several implementation programs will be shown in the coding and database. Next, the implementation of coding using a framework will be carried out on the website. Figure 4 shows the initial page view :

Fig 5. Homepage SIAKAD

The course data menu functions as information on course code, name of the supporting lecturer, room, credits and the course details menu functions to inform details of the courses taken and student status

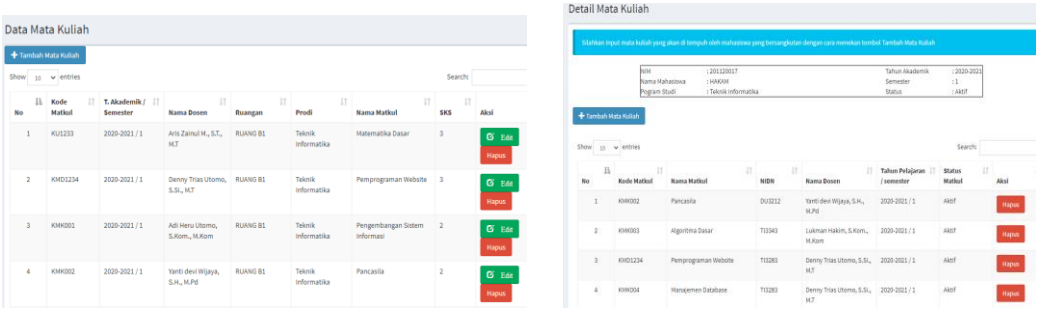


Fig 6. Subject and sub-subject

The student information display menu is displayed when students log into the system. There is information about the date of birth, address, lecturer guardian and so on. Then there is an attendance menu used to make attendance online. The course schedule information consists of the day, the name of the course, the supporting lecturer and the time the lecture takes place. Figure 6 shows the display of the biodata information menu and course attendance

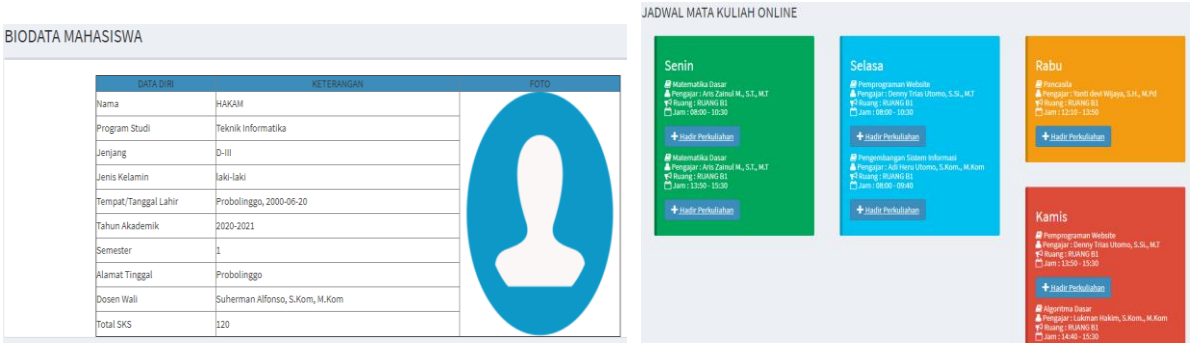
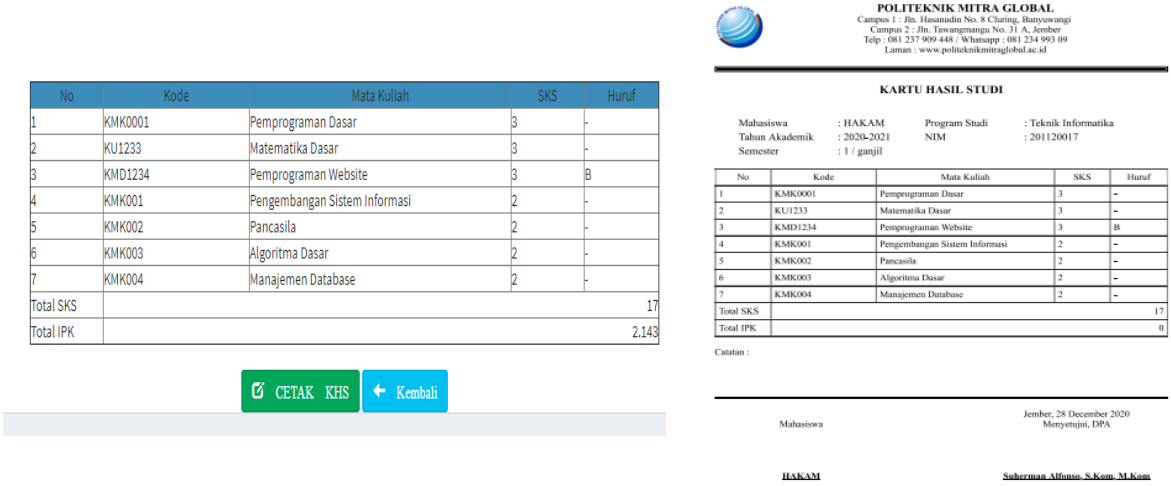


Fig 7. Menu biodata and attendence

Furthermore, there is a GPA value menu that students can see. The value displayed includes the course code, course name, number of credits, grades and GPA. On that menu there is a print KHS button which functions to print grade reports according to what is displayed on the menu. The printed report will display student biodata, details of semester grades, signatures of students and supervisors.



No	Kode	Mata Kuliah	SKS	Huruf
1	KMK0001	Pemprograman Dasar	3	-
2	KU1233	Matematika Dasar	3	-
3	KMD1234	Pemprograman Website	3	B
4	KMK001	Pengembangan Sistem Informasi	2	-
5	KMK002	Pancasila	2	-
6	KMK003	Algoritma Dasar	2	-
7	KMK004	Manajemen Database	2	-
Total SKS				17
Total IPK				2.143

CETAK KHS Kembali

POLITEKNIK MITRA GLOBAL
Campus 1 : Jln. Hasanudin No. 8 Cluring, Banyuwangi
Campus 2 : Jln. Tawangmangu No. 31 A, Jember
Telp : 081 237 909 448 / Whatsapp : 081 234 993 09
Laman : www.politeknikmitraglobal.ac.id

KARTU HASIL STUDI

Mahasiswa : HAKAM
Tahun Akademik : 2020-2021
Semester : 1 / ganjil
Program Studi : Teknik Informatika
NIM : 201120017

No	Kode	Mata Kuliah	SKS	Huruf
1	KMK0001	Pemprograman Dasar	3	-
2	KU1233	Matematika Dasar	3	-
3	KMD1234	Pemprograman Website	3	B
4	KMK001	Pengembangan Sistem Informasi	2	-
5	KMK002	Pancasila	2	-
6	KMK003	Algoritma Dasar	2	-
7	KMK004	Manajemen Database	2	-
Total SKS				17
Total IPK				0

Catatan :

Mahasiswa

HAKAM

Jember, 28 December 2020
Menyetujui, DPA

Suherman Alfonso, S.Kom, M.Kom

Fig 8. Print KHS

3.4 *Integration and system testing*

The system testing phase uses a black box. Black box testing looks for program errors that are made by looking at the functions provided are the same as those that are running, while white box testing is based on the program's internal structure [8]. The following is Table 1 of black box testing

.

Table 1. *Black Box*

No	Fitured	Status
1	Login	Ok
2	Information identity	Ok
3	Management data user's	Ok
4	Management data student	Ok
5	Management data lecturer	Ok
6	Management data GPK	Ok
7	Management news and information	Ok
8	Upload data	Ok

Then a questionnaire test was carried out on students regarding the use and function of the academic information system implemented on campus (Likert scale) [9]. The number of questionnaires was given to 15 students with informatics and accounting engineering study programs. Following are the questions and answers to the questionnaire in table 2

Table 2. Questioonaire

No	Question	Answer				
		Very Good	Good	Neutral	Bad	Very Bad
1	The system provides a user friendly display	3	8	4	-	-
2	The system can be run lightly and easily	1	12	2	-	-
3	Features can run according to its function	2	10	3	-	-
4	Easy to understand system		13	2	-	-
5	Menus are integrated with each other according to their function	1	9	5	-	-
6	Data displayed on the system is in accordance with the existing information	-	8	5	2	-
7	The system can facilitate campus academic activities	3	12	-	-	-
8	Each button provided on the menu runs according to its function	1	10	3	1	-

The table above is the result of the questionnaire test given to students. User calculations were performed using a Likert scale of satisfaction. Calculation of the Likert scale starts by adding up all the data, giving weight values and calculating percentages. The results of the calculation presenting each question will be averaged to get the value of customer satisfaction. The following is the formula for calculating the Likert scale value: [10]

$$\text{in} = \frac{100}{n}$$

$$\text{ip} = \frac{x}{z} \text{ x } 100$$

Note :
in : interval
ip : presentase index
n : jumlah skor
x : score total
y : max score
z : min score

From calculation (1) interval value is 0% until 100%. The following are the criteria for interpreting the score based on the interval:

- 0% – 19,99% = Very bad
- 20% – 39,99% = Bad
- 40% – 59,99% = Neutral
- 60% – 79,99% = Good

- 80% – 100% = Very good

Dari perhitungan menggunakan rumus skala likert indeks presentase (2) didapatkan nilai rata-rata indeks presentase kepuasan rata-rata pengguna sebesar 76.83%. Dari interpretasi skor (1), diketahui bahwa 76.83% berada dalam kategori Baik. Dengan demikian, dapat disimpulkan bahwa mahasiswa merespon baik dengan pembuatan sistem informasi akademik.

3.3 *Operation and Maintance*

At this stage maintenance of the Global Mitra Polytechnic academic information system is carried out by making an existing schedule for application inspection. This purpose is done to prepare if in the future after use there is an error or system repair

4 CONCLUSION

This research was carried out using the Waterfall Method and a website-based application. The results of the academic information system make it easy for users to manage academic processes such as the process of student study results cards, announcement information, data uploads, course schedules and so on which were originally manual to digital and can be added value for the newly established campus accreditation.

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