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DESIGN OF A WEB BASED ACADEMIC COUNSELING INFORMATION SYSTEM IN UNIVERSITY: A CASE STUDY OF JAKARTA STATE UNIVERSITY, INDONESIA

ZARINA AKBAR[1], MAUNA[2], ERNITA ZAKIAH[3], MARATINI SHALIHA AISYAWATI[4]

[1] FACULTY OF PSYCHOLOGY, UNIVERSITAS NEGERI JAKARTA, JAKARTA, INDONESIA.
[2] FACULTY OF PSYCHOLOGY, UNIVERSITAS NEGERI JAKARTA, JAKARTA, INDONESIA.
[3] FACULTY OF PSYCHOLOGY, UNIVERSITAS NEGERI JAKARTA, JAKARTA, INDONESIA.
[4] FACULTY OF PSYCHOLOGY, UNIVERSITAS NEGERI JAKARTA, JAKARTA, INDONESIA.

EMAIL: [1]zarina_akbar@unj.ac.id, [2]mauna@unj.ac.id, [3]ernitazakiah@unj.ac.id, [4]maratiniaisya10@gmail.com

ABSTRACT:
This research presents the design of web-based academic counselling information system. The research aims to reveal a design framework for a web-based academic counselling information system integrated with universities, lecturers, students to support academic counselling processes. In the implementation of academic counselling, lecturers and students must work together to create quality guidance. This research is structured as a design-based research approach. This research presents the results of the first cycle of design-based research. The research follows a five step process: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. A pilot study involved three psychologist and two counsellors as reviewers in Jakarta State University Indonesia. The system examined with ten students during implementation. Feedback from reviewers guided improvements. Overall the web is receptive, easily access when used, and get information directly. Moreover, the web can still be developed such as adding notification features, providing pop-ups with further information as a guide for users, connecting to users email or whatsapp, and being synchronized with the counselor's activity schedule. With this system is expected also to become a web-based academic counselling in order to make information system faculty better in particular and all faculties of university all over Indonesia.
KEYWORDS: Web-based, Academic Counseling, Higher Education

1) INTRODUCTION:

Undergoing a formal learning process always has its challenges. Usually, higher education is the final stage of formal learning. The learning system in higher education is different from that in school, such as emphasizing independent learning and self-teaching [1], arranging the selection of courses, schedules, and times [2]. Higher education provides opportunities for students to study subjects of interest to help achieve career goals after graduation. Students can have academic advising and consultation sessions to help them in their studies, including making study plans and consulting on obstacles faced during the lectures. Academic advising is defined as a service that guides students according to their needs [3]. Academic advising is the process of providing guidance and advice to students to assist them in the successful completion of their studies [4, 5]. This process involves consultations between academic advisors and students to map out their course of study and to help them overcome any academic challenges they may face [6].

In Indonesia, campuses provide academic advisors for each student in carrying out the academic advising and consultation process. The academic advisors at Universitas Negeri Jakarta have the right to provide considerations, guidance, advice, and approval to their students in determining their study plans [7]. The success of the implementation of education can be seen from students' academic achievements, for example, through the achievement index (IP) and the length of study time [8]. Students who have a high achievement index and can complete their studies within the specified period are categorized as students with academic achievements [9]. The academic advisors help universities to retain students who perform well and graduate on time. The duties of academic advisors are to monitor the progress of students' studies, assist in preparing the lectures, and provide consultations related to academics and non-academic activities[10, 11].

In the implementation of academic advising and counseling, lecturers and students must work together to create quality consultation. Academic advising and counseling that run well can effectively increase motivation, learning achievement, and engagement in learning [12, 13, 14]. Quality academic advising helps students arrange their classes and motivates students in their studies. In addition, the counseling process can handle academic and non-academic problems, monitor student development until students can complete their studies well [15, 16].

In general, academic advising service is still carried out conventionally, namely, students and lecturers meet directly on campus, students bring academic advising books or study plan cards, and the results of the consultation are recorded manually by students [6]. The academic advisor only provides validation of the Study Result Card (KHS), provides validation of how many Semester Credit Units (SKS) can be taken, and which courses can be taken by students based on the achievement index achieved previously. Usually, the advising process is carried out at a certain time together. However, due to the limited time of lecturers and considering the number of students being guided, and limited communication between students and lecturers, sometimes the schedule can change. Another problem in the academic advising and counseling process is that the number of students being advised from various classes and not having special documents or archives for their students makes it difficult for the academic advisor to get to know their students and has an impact on making it difficult to monitor their academic development. This certainly reduces the efficiency, quality of the advising process, and effectiveness of the results of counseling on the student's academic process [18].

This problem shows the need for solutions that can support the academic advising process to be more structured, easily accessible, and responsive to student needs. The use of information technology can accommodate the needs of the academic advising process [19]. Information technology is used to process data, including processing, obtaining, and storing data in various ways to produce relevant, accurate, and timely information [3]. Information technology, such as a web-based system, can be used to organize data, simplify, and accelerate the advising process.

Currently, the academic advising process at Universitas Negeri Jakarta is still carried out conventionally, not supported by a web-based information system. Academic advising with a web-based information system allows students to make appointments with the advisors, carry out online advising, and keep complete records of each advising session. On the other hand, the advisors will find it easier to manage the time, monitor student academic development, and document the advising sessions to support better planning and decision making. On the web, features can also be developed for lecturers to get to know their students better with psychological measurements. The results of psychological measurements help lecturers understand students' personalities, which then become the basis for the intervention plan that will be given, namely, academic counseling [20, 21].

This web-based academic advising system that has been developed is still in the form of a prototype. To achieve meaningful advising quality, a prototype was also developed to improve student self-development, especially related to mental health. The prototype was developed to encourage the counseling process by providing counseling services, brief psychological measurements, and information related to mental health and psychological services in general.

2) METHODS:

The development of this web-based academic advising information system uses the Rapid Application Development (RAD) method. This method was chosen because it enables faster delivery of the system to users, without having to wait for all features to be completed first [22]. RAD is a sequential linear development method that focuses on short development cycles in software development [23]. It emphasizes rapid development through an iterative approach (repeated) in which a working model is constructed early in the development process to define user requirements and is then discarded. RAD development stages [24] include the Requirements Planning Phase, planning the system requirements; RAD Design Workshop, involving users to design and build the system (this is done iteratively until a mutual agreement is reached); and Implementation Phase.

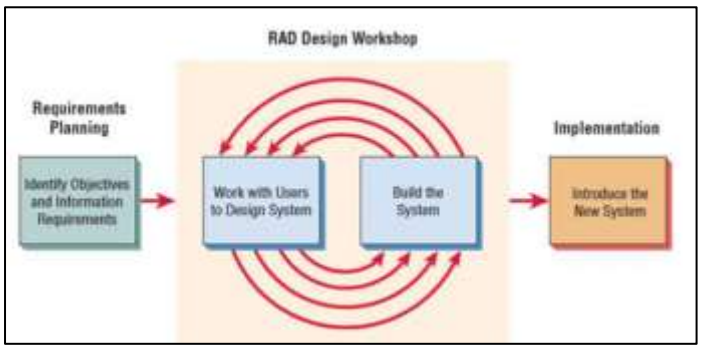


Figure 1. The RAD design

(a) Requirements Planning Phase

At this stage, observations, interviews, and documentation were conducted to identify the objectives of the system to be built, the information requirements that would arise to achieve these objectives, and to analyze all systems that would be needed by users. Data collection techniques were employed to carry out this process:

1. Observation

Observation means directly seeing how the process was carried out before and during academic advising sessions. The results of the observations showed how the academic advising and counseling process was.

2. Interviews

Interviews were conducted with students and their academic advisors. Open-ended questions were given to obtain comprehensive and in-depth answers related to the experiences and problems during the process.

3. Documentation

Documentation study was used to complete the data obtained from the results of observations and interviews by looking at documents or reports related to the academic advising and counseling sessions.

The results of the needs analysis of the system that will be used on the academic advising and counseling website are as follows:

Table 1. The administrator's needs analysis

No	User's needs
1.	Login administrator
2.	Students' and advisors' data and accounts management
3.	Information features and articles management
4.	Administrators' (staff/head of study program) data management
5.	The administrator's home room

Table 2. The lecturer's needs analysis

No	User's needs
1.	Academic advisor's login
2.	Academic advisor's profile management
3.	Academic advisor's home room
4.	Receive, rearrange, and accept schedules for academic advising and counseling.
5.	Live chat feature with students, send, view, and download documents
6.	Input the results of academic advising and counseling with students
7.	View the history of academic advising and counseling sessions

Table 3. Students' needs analysis

No	User's needs
1.	Log in for students
2.	Manage students' profiles
3.	Students' home room
4.	Make appointments for academic advising sessions with the advisors
5.	Live chat feature with advisors, and sending, viewing, and downloading documents
6.	View academic advising and counseling history

(b) RAD Design Workshop

At this stage, the user's needs analysis results are developed into a use case diagram. An activity diagram is created from each diagram to describe the flow of each use case in the system to be developed.

1. Use Case Diagram

The use case is a description of the function of a system from the user's perspective [25]. This design uses the Unified Modeling Language (UML).

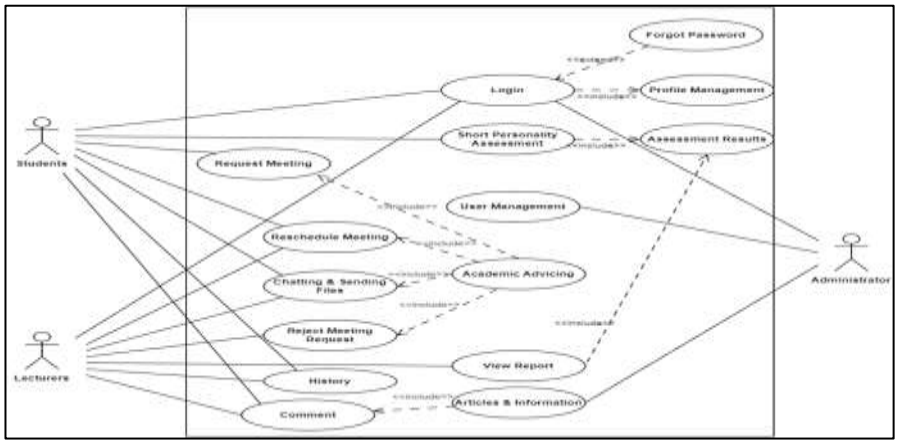
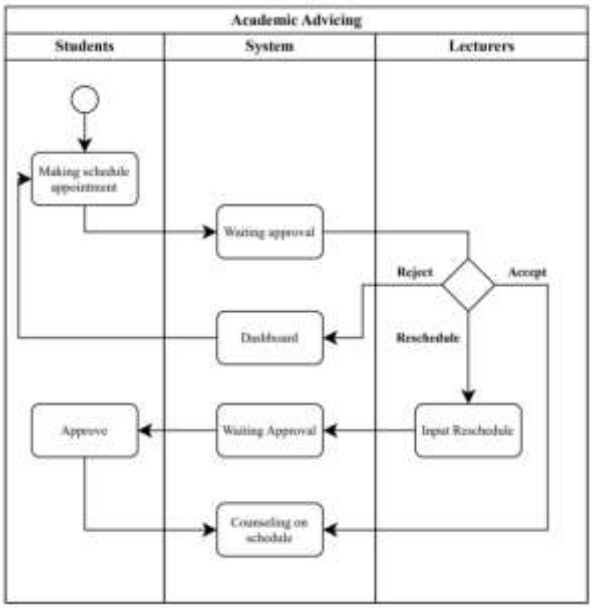


Figure 2. Use case diagram

2. Activity Diagram

An activity diagram was used to explain each existing use case so that the system description was more complete. Procedural logic, business processes, and workflows can be easily described by an activity diagram [25]. This diagram would make it easier for developers to build the system. One example of an activity diagram of the academic advising process is shown in Figure 3.

Figure 3. Academic advising activity diagram



3. Implementation

At this stage, the results of the system development design were then translated into a system program using the PHP and MySQL programming languages. Then, a system test was carried out. System testing focuses on the system flow and system functionality. This was done to minimize errors and find out whether the system is running well or needs further improvement.

3) RESULT:

The UNJCARE web program is a web-based e-counseling specifically for students and lecturers at Universitas Negeri Jakarta to improve the quality of student academic advising sessions. In this prototype product, UNJCARE has been synchronized with student and lecturer data of the Psychology Undergraduate Study Program, Faculty of Psychology, Universitas Negeri Jakarta so that on the UNJCARE web sign-in page, students and lecturers can use their student registration number (NIM) and employee registration number (NIP) as their username and password.

Figure 4. The login page display on a computer or laptop

Figure 5. The login page display on a smartphone

After successfully logging into the UNJCARE website, users will be on the main page (dashboard). Data on students and academic advisors have also been adjusted in UNJCARE so that students can only have academic advising sessions with their advisors. Students can make appointments for their sessions with available times only during working hours. Requests for consultations will be sent to the lecturer's account, and the lecturer can determine whether to accept the schedule or rearrange it. A messaging feature is also provided, along with uploading files, media, and links. UNJCARE has also been developed to be able to connect with the user's WhatsApp or email to provide notifications in real time.

Figure 6. Dashboard layout

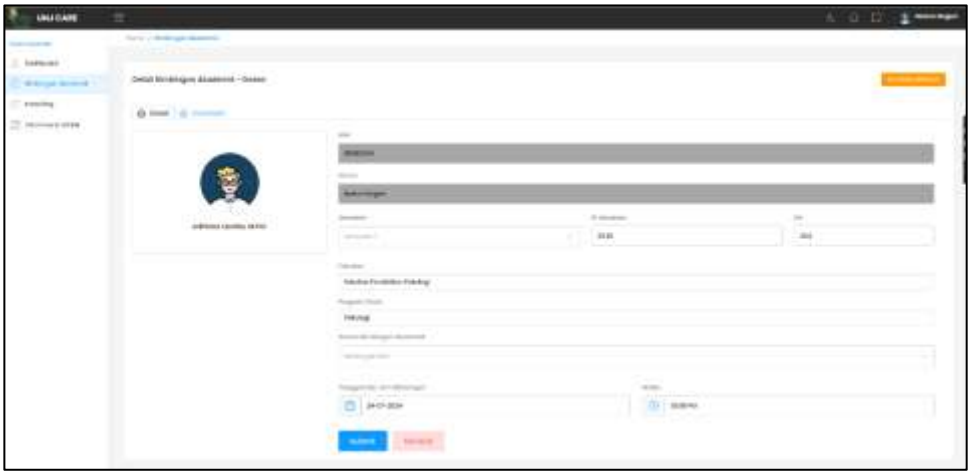


Figure 7. Arranging academic advising schedule

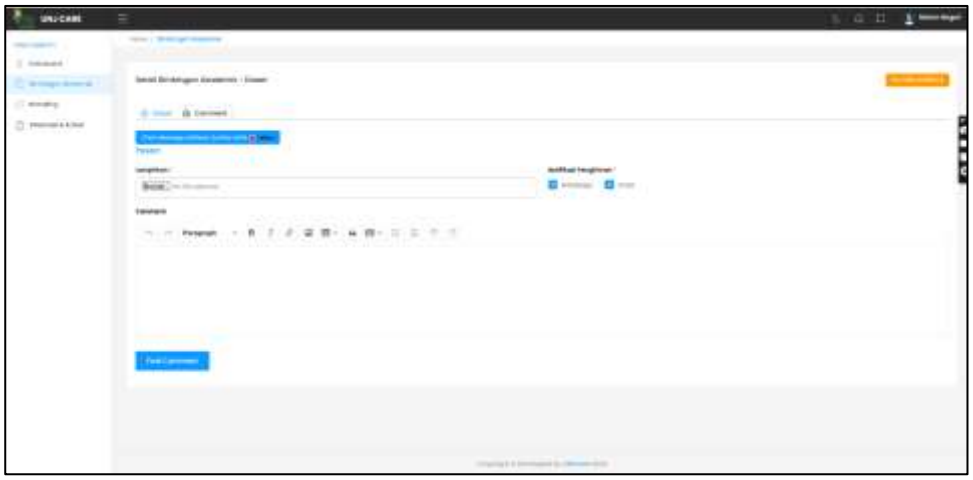


Figure 8. Chatting feature

Besides the academic interests of students, UNJCARE also facilitates students' needs for psychological counseling with professional staff (counselors) on campus. To overcome the limited time to meet counselors on campus, UNJCARE provides information on counselors available at the nearest health center. UNJCARE also facilitates education related to mental health, mental disorders, and self-development through article pages. The use of a web system will help control the guidance process and save the history and results of the consultation, so that the guidance process will be more effective and efficient. Based on these things, the UNJCARE web program design consists of three main pages, namely the academic advising page, the counseling service page, and the articles and information page.

4) Discussion:

After the program was designed and the prototype was made, a trial was conducted to obtain input to improve the program. The trial was conducted on nine participants, consisting of six students and three lecturers (advisors). From the results of the trial, it can be concluded that the sign-in page was considered to have good quality (55.5%) by participants and very good (44.5%). Then, the dashboard page was dominated by good comments (67%) from participants. In addition, the academic advising and counseling features were considered quite good to very good.

Table 4. Student user survey on the academic advising page

No	Qustions	Responses				
		1 Completely Disagree	2	3	4	5 Completely Agree
1	Users understand the features			16,7%	16,7%	66,7%
2	The function of the features helps users				33,3%	66,7%
3	The responsiveness of the page is satisfactory			16,7%	66,7%	16,7%

Table 5. Student user survey on the academic advising page

No	Qustions	Responses				
		1 Completely Disagree	2	3	4 Completely Disagree	5 Sangat Setuju
1	Users understand the features			16,7%	16,7%	66,7%
2	The function of the features helps users				33,3%	66,7%
3	The responsiveness of the page is satisfactory			16,7%	83,3%	

Table 6. Lecturer users' survey on the academic advising page

No	Qustions	Responses				
		1 Completely Disagree	2	3	4	5 Completely Agree

1	Users understand the features				33,3%	66,7%
2	The function of the features helps users				66,7%	33,3%
3	The responsiveness of the page is satisfactory				100%	

Table 7. Lecturer users' survey on counseling page

No	Qustions	Responses				
		1 Completely Disagree	2	3	4	5 Completely Agree
1	Users understand the features				33,3%	66,7%
2	The function of the features helps users				33,3%	66,7%
3	The responsiveness of the page is satisfactory				66,7%	33,3%

The next test is to evaluate the functionality of each feature in the developed academic advising system. The list of tests on students is shown in Table 8, and the lecturers (advisors) are listed in Table 9.

Table 8. Students' features testing results

No	Page testing	Testing Procedures	Testing Results
1.	Log in	Input the username and password correctly and incorrectly	Success
2.	Academic Advising	1) Make an appointment for academic advising, 2) Determine the date and time of academic advising, 3) Reschedule, 4) Send messages and attachment files	Success
3.	Counseling	1) Choose a psychologist (who is also a the lecturer), 2) Make an appointment for counseling, 2) Determine the date and time of counseling, 3) Reschedule the counseling schedule, 4) Send messages and attachment files, 5) View the counseling schedule that has been made, on process (approved schedule, waiting for counseling time), canceled schedule (there is a change in the schedule), and completed	Success
4.	Dashboard	1) View notifications of the history of academic advising and counseling sessions that have been made, are being processed, canceled, and completed, 2) Use the menu bar to go to the academic advising page, 3) Use the menu bar to go to the counseling page, 4) Use the menu bar to go to the article and information page, 5) Use the menu bar to go to the profile settings page	Success

Table 9. Advisor (lecturer)'s features testing results

No	Page Testing	Testing Procedures	Testing Results
1.	Log in	Input the username and password correctly and incorrectly	Success
2.	Academic Advising	1) View academic advising requests, 2) approve academic advising schedules, 3) reschedule academic advising sessions, 4) reject academic advising requests, 5) send messages and attachment files, 6) create summaries of academic advising results	Success
3.	Counseling	1)View counseling requests, 2) approve counseling schedules, 3) reschedule counseling sessions, 4) reject counseling requests, 5) send messages and attachment files, 6) create summaries of the counseling results	Success
4.	Dashboard	1)View notification of the history of academic advising appointment and requested counseling, on process, cancelled, and completed, 2) use bar menu to go to the academic advising page, 3) use bar menu to go to counseling page, 4) use bar menu to go to articles and information page, 5) use bar menu to go to profile setting page	Success

5) CONCLUSION:

Overall, the web-based academic advising system is acceptable, easy to use, and understandable when first used by students and lecturers. The features currently available are sufficient for web needs. However, according to the testing results, the academic advising web still needs to be improved in several parts, such as needs to be added

with a notification feature related to the academic advising and counseling schedules for student and lecturer users. In the personal data section, the home phone number is replaced with the home address or contact of the closest person, providing a pop-up for further information after using the feature of making or rescheduling an advising or consultation appointment.

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8) Conflict of Interest: The authors declare that there is **no conflict of interest**.

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