

# The Design of Online Expert System as an Alternative Guidance with the Academic Advisory Lecturer of University Students of State University of Malang

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**Abstract**— Expert system is a system tried to adopt the human knowledge into a computer in order to finish problems as well as some experts. After conducting a survey of interview with the university students, it was obtained an information stated that almost the university students could not consult either in academic or non- academic with their advisors because of the limitation of time and place. As a result, the process of academic guidance is still not maximum yet. Based on that problem, therefore, the purpose of this research is to develop an expert system to make an appointment of consultation with the academic advisors. By using this system, hopefully all the university students can consult, ask for guidance, and make an appointment with their academic advisors easily. This research uses a waterfall development method and the expert system development tends to use expert system development model. This research produces a system design that gives a solution to make an appointment for university students when they want to consult and ask for guidance with their academic advisors.

**Keywords**— *information System, Expert System, Academic Advisor, Waterfall.*

## I. INTRODUCTION

Academic guidance is the guidance efforts that are done by academic advisory lecturers (PA) to the university students as their responsibility in guiding their students. These efforts is helping the university students in planning their study, solving problems in studying, and developing the university students' ability optimally. Helping here means that the academic advisors do not determine the path or the decision of the students' selection. The decision-making from the university students is done by the university students themselves. Meanwhile, the help from the advisors (PA) can be the relevant academic information, study program orientation, building appropriate attitude and behavior to the university students, giving critics and suggestions in the process of decision-making, giving a good model, and giving agreement

or refusal toward something proposed by university students according to the appropriateness and the applicable provisions in the area of State University of Malang.

Guidance either in academic or non-academic is salient, especially in the process of semester credit system (SKS). In programming SKS, every university student is given freedom to choose and determine a program and the study load in accordance with their interests and ability.

This freedom will have positive effect if every university student has the proper information and know the rules of SKS that must be followed. This point is very important and thus, the suggestion from an academic advisor is necessary in giving proper guidance and in finishing their study in their major and in the overall program. Besides, the function of an academic advisor is to help the university students in solving their problems they faced in the process of studying, and to encourage the university students in developing their attitude and behavior in the study to have a power and success.

The number of university students who need guidance from an academic advisor and so do the responsibility of guiding the students from the academic advisor that is not achieved yet optimally because of the dense lecturer schedule in State University of Malang, makes the university students facing difficulty and makes them reluctant to do consultation. There are so many social media that can be used as a means of consultation and make an appointment with the academic advisor, but they feel that they faced difficulty because of the schedule of the academic advisors (PA) to do consultation and response via these social media.

According to the above problems, the researcher argues that it is necessary to have an effort to solve the guidance problems to the academic advisors (PA) for the sake of academic purpose. That is why the expert system as an alternative does some guidance with the academic advisors

(PA) who can help the university students of State University of Malang to consult and ask for a signature by making an appointment with the academic advisors (PA). By using this expert system, a computer as a medium for storing the experts' knowledge, the academic advisors (PA), has an ability to accomplish the problems in making appointment as well as the academic advisors (PA) have.

Therefore, in this chance, the researchers focus on the expert system-making in designing application by online. The design of this expert system is based on the researchers' want to provide a system that helps the university students make an appointment with the academic advisors (PA) to have a signature and intense consultation. Considering these cases, the researchers will investigate the problems in this paper entitled "The Design of Online Expert System as an Alternative Guidance with the Academic Advisory Lecturer of University Students of State University of Malang."

## II. LITERATURE REVIEW

There are some stages in developing expert system as explained below:

### A. Feasibility Analysis

The first stage is coming from the developing process that is called as system analysis process. In this stage, the first step to do is finding the problem and the need from the users; this process can be called as user requirement engineering. After the process of user requirement engineering, then the next process is making the concept design of expert system, the design of knowledge base and the rules to present knowledge from the knowledge base. The following part is the feasibility analysis in the expert system that will be developed as the following:

The problem determines the best schedule of the university students to have an appointment from the academic advisor.

The criteria: the lecturer's schedule of the academic advisors, the academic advisors' time that willing to be asked for some signatures and consultation, the position of the academic advisors when the university students want to see them, and the complaint that the university students have toward the academic advisors.

### B. Conceptual Design

The second stage of the developing process is that a system design process. In this stage, the process that is conducted is making a design of expert system working, designing the knowledge base, designing the system rules and designing face-to-face system.

### C. Knowledge Acquisition

The third stage of the developing process that is a process of acquiring knowledge and makes it formal in the knowledge base of expert system. In this stage, the acquisition process of knowledge can be likened with distillation process in which

the salient facts and the rules from the experts should be isolated.

### D. Knowledge Representation

The fourth stage of the developing process is that knowledge representation that is to change the knowledge base acquired into basic language of the knowledge by using premise, in which this premise, some knowledge can be used as a new information. The first step to do is making a system by using the help from Notepad ++ for editing process of HTML, PHP, JQuery and CSS. Besides, in order the system can work, it is necessary to have XAMPP as a local server and can be accessed by using browser. Furthermore, to store the data or database, it uses MySQL that can be edited by using PHPMyAdmin, one of the application units in XAMPP.

### E. Validation

Validation is the name given in the examination process and analysis that guarantee the software based on its specification and fulfill the users' need. This process is started by observing the product requirements and then by observing the design and code examination till the system testing is accomplished.

### F. Technology Transfer and Maintenance

This stage is ongoing system covering the correction from the bug and error that cannot be found in the previous stages. The maintenance and the development of software are very important because the software is never static forever, but it tends to dynamic based on the users' need.

## III. METHODE AND DESIGN

In the designing process, a system depicts the overall system of how the experts work starting from depicting dataflow diagram, usecase diagram, activity diagram, sequence diagram, and erd diagram.

### A. Dataflow Diagram

Data Flow Diagram (DFD) is a description from a system that uses a number of symbol shapes to depict how the data flow through a related process. DFD level 0 or context diagram from this expert system has 3 entities, namely university students, the academic advisory lecturer, and admin. DFD level 0 is presented in Figure 1-2.

### B. Usecase Diagram

Usecase diagram is one of the shapes of diagram in UML that gives a description about functional requirement from the system that will be made, in which it is described the interaction, scenario as well as the duty between the users and the system, shown in Figure 3-5.

C. Activity Diagram

Activity diagram is a model activity of data flow in an ongoing system, both from the planned system and its end as shown in Figure 6-7.

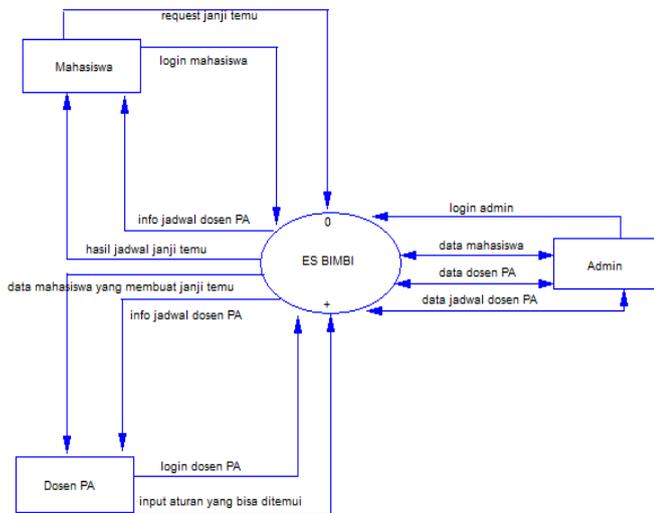


Fig. 1. DFD Level 0

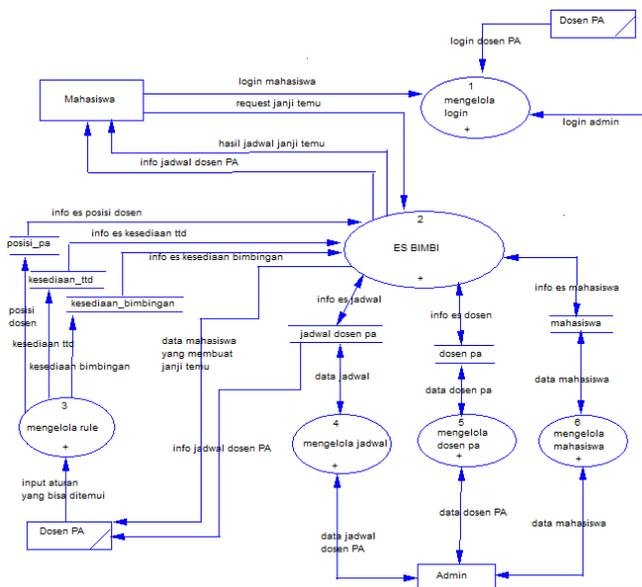


Fig. 2. DFD Level 1

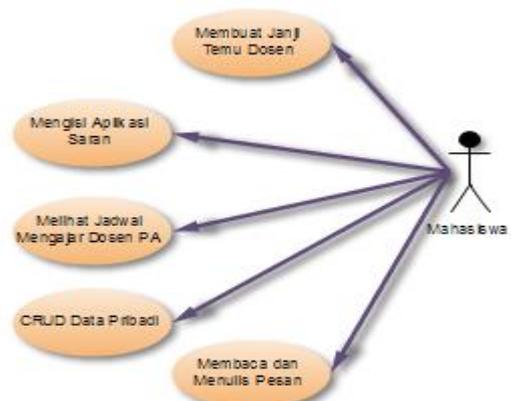


Fig. 3. Usecase Diagram Mahasiswa

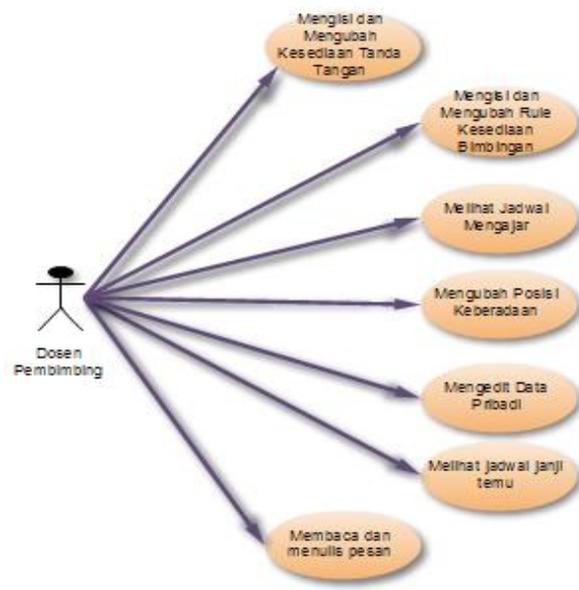


Fig. 4. Usecase Diagram Dosen Pembimbing

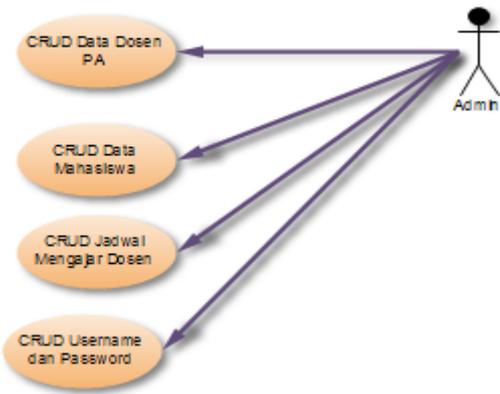


Fig. 5. Usecase Diagram Admin

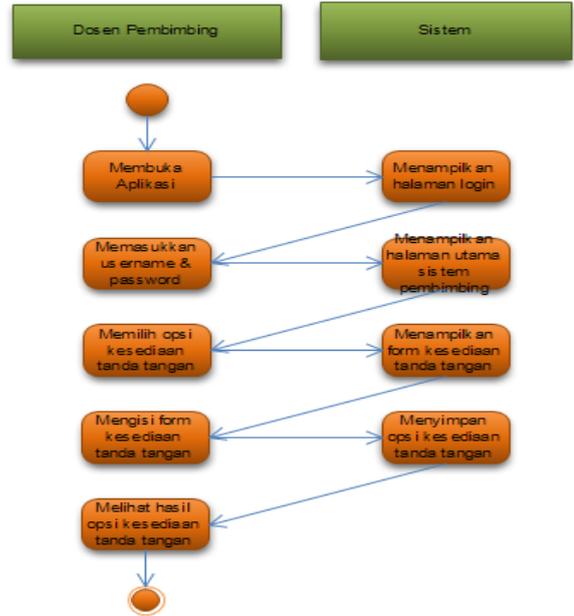


Fig. 7. Activity Diagram Kesediaan Tanda Tangan

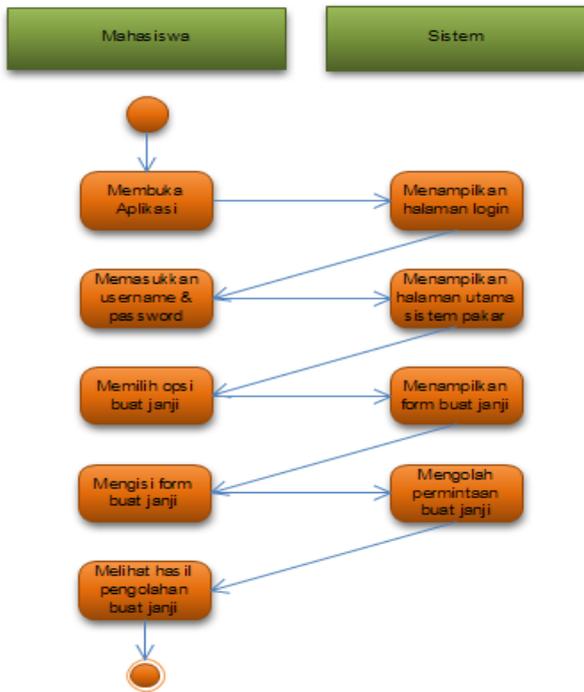


Fig. 6. Activity Diagram Buat Janji

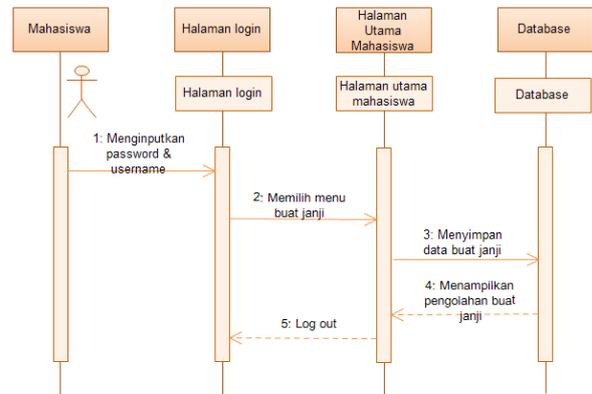


Fig. 8. Sequence Diagram Buat Janji

D. Sequence Diagram

Sequence diagram is a diagram that describes the interaction between objects or the actors in a system, as shown in Figure 8-9.

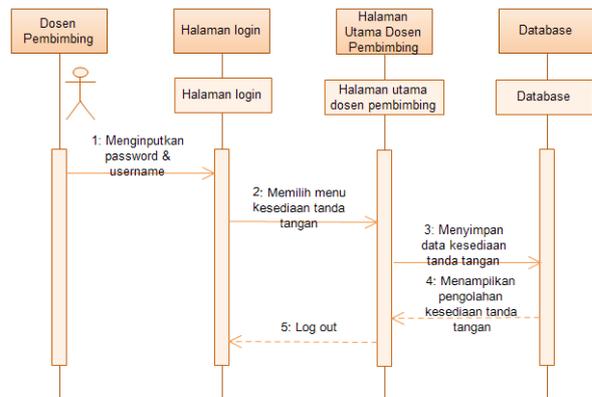


Fig. 9. Sequence Diagram Kesediaan Tanda Tangan





Fig. 15. Design Of Option “Kesediaan Tanda Tangan”

#### IV. CONCLUSION

This expert system is still in the form of design and it is designed as minimize as possible by optimizing the system function. In addition, the color aesthetic and the layout are arranged by using a simple concept. Hopefully, the users can focus in accessing the information and the data based on the function/feature offered by this expert system.

In designing this expert system, the researchers use waterfall development method as the developing system generally and the development of the experts by Kampran Parsaye and Mark Chignell, because this method is suitable for developing expert system that has small developing scale.

For optimizing the usage of this expert system, there are some suggestions to follow:

- A. *Online expert system is as an alternative guidance with the academic advisors should be implemented and should be socialized in the university to increase the service and the function of academic advisors in education.*
- B. *To increase the speed access, it is suggested that using hosting-payment with high server specification to increase the stability and good safety. This is meant to get the access service of multi user fast and sufficiently.*
- C. *In installation of local server, it is suggested to use minimal XAMPP version 1.8.2 to optimize the work of this expert system.*

There are some suggestions in developing this further product as the following:

- A. *Online expert system as an alternative guidance with the academic advisors (PA) should be applied to several study programs and university in order to help appointment-making with the academic advisors.*
- B. *Online expert system as an alternative guidance with the academic advisors should be developed again to make an appointment between the academic advisors and the thesis' advisors.*
- C. *It is necessary to increase the safety toward this expert system if it is installed in the network connection. For example, by adding anti-SQL injection and xss filtering features.*
- D. *The development of this expert system is still in the form of design and there are still some weaknesses in some parts. It is suggested to the web experts and the information technology teaching program students to develop this expert system better.*

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