



**INFORMATION SYSTEM DESIGN
FOR FINAL PROJECT CONSULTATION**

Hirawati Oemar¹, Sumarto², Aan Komariah³, Maulana Malik Ibrahim⁴, Anis Saleh⁵
^{1,2,3} Jurusan Administrasi Pendidikan Universitas Pendidikan Indonesia, ^{1,4} Jurusan Teknik Industri
Universitas Islam Bandung, ⁵ Jurusan Teknik Industri Universitas Muslim Indonesia
Jln. Dr Setiabudhi No.229 Bandung 40154^{1,2,3}, Jln. Taman Sari No. 1 Bandung 40116¹³, Jln. Jl. Urip
Sumoharjo No.km.5, Makassar 90231⁵

ABSTRACT

This Final Project is one of the graduation requirements for Industrial Engineering students at the Islamic University of Bandung. Currently. The final project consultation process is conducted manually using physical documents owned by each student as proof of consultation in the form of a consultation card. The problem faced was the difficulty in monitoring consultations and recording consultation discussions which were not well organized. The purpose of this study is to design a consulting information system using the prototyping method. The prototyping method is a system development method used to describe the system. The stages in this method consist of: (1) The planning stage is the identification of system requests. (2) the analysis phase analyzes the existing business processes in the final project section and identifies functional and non-functional requirements, (3) the design phase includes the interaction design of systems, processes, data and logical systems and physical interfaces. (4) Implementation phase of database and website development using PHP language and MySQL database. The results obtained from this study are business process consulting for the Final Project after the implementation of the proposed information system; final project consulting information system design which is expected to facilitate the consultation process in terms of time and consultation file documentation.

Keywords: *final project consultation, information system, prototyping method, PHP*

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Address :
Jl. Urip Sumoharjo Km. 5 (Kampus II UMI)
Makassar Sulawesi Selatan.

Email :
Jiem@umi.ac.id

Phone :
+6281341717729
+6281247526640

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1. INTRODUCTION

Final Project is one of the courses that must be taken before graduating to become a bachelor. In working on the final project, students at the Islamic University of Bandung must conduct a research which consists of several stages and can be accounted for. One of the important stages that students must do when conducting a final project research is that students can explain their research clearly in front of the examiner. The process of explaining the final project research is divided into three parts, namely at the time of proposal presentation, seminar and final project session.

In the midst of the current development of technology and information, a documented process of student final project consultation must be done. The importance is due to the knowledge of students' final project progress will increase the number of graduates an institution wants to achieve (Akbar and Putra, 2013). The rapid presentation of information is one of the factors in the success of the institution. In this case, a management information system is needed in sending and processing information optimally.

In the process of working on the final project, students will not work on the final project report alone. Unisba industrial engineering study program will appoint lecturers to guide in the process of working on the final project conducted by students. This is done to achieve the final result that meet the criteria of all parties involved and as a proof that the student is entitled to pass.

The final project consultation system implemented in the UNISBA industrial engineering study program is a conventional system, where the students and lecturers must meet in person to do the consultation. In addition, students can conduct on-line consultation by sending a final project report to the supervisor. The final project scheduling system is done through scheduling in a conventional way, where the final task team gets the registration data for the presentation in question. Subsequently, the final task team will contact the examiner lecturer to ask if he is willing to evaluate the presentation. If the lecturer agrees the administration will make a written assignment letter that will be forwarded to the head of the study program for signature.

The drawback of the current system is that monitoring consultation is difficult to do. The different distances and schedules between lecturers and students sometimes create miscommunication so that the consultation process is neglected. In addition, the recording of the consultation discussion was not well organized. Starting from the above problems, we need a system that can organize student consultation.

The final project information system and final project consultation have been carried out by many previous studies including: Final Project Information System Design and Practical Work (Prasetyo, 2010), Analysis and Web-Based Final Assignment Consultation System at the Faculty of Information Technology (Constantianus, 2015), and Final Project Consultation Online Application Design (Sastypratiwi and Dwiyani, 2016).

2. LITERATURE REVIEW

2.1 Information Systems

An information system is a system within an organization that meets the needs of daily transaction management, supports operations, is managerial, and strategic activities of an organization and provides certain outside parties with the required reports. (Hutahean, 2015).

2.2 Information System Modeling Tool

Information system modeling is used with several tools, namely use case diagrams, business process model notation 2.0, and entity relationship diagrams.

2.3 Use Case Diagrams

Use Case Diagrams is a diagram that describes the relationship between actors in a system (Whitten and Bentley, 2007).

2.4 Business Process Model Notation 2.0

Object Management Group developed Business Process Modeling Notation 2.0, a standard format for describing business processes with the aim of providing an easy-to-understand notation for all business customers, from business analysts to technical engineers who are responsible for integrating the technology that can execute the process, and ultimately use it in handling and tracking processes what's in it (Group, 2011).

2.5 Entity Relationship Diagram (ER-Diagram)

Entity relationship diagrams is a model to describe the relationship between entities in a database. Data is converted into data diagrams using various conceptual tools in the entity relationship diagram model (Elmasri and Navathe, 2016).

2.6 PHP

According to Sutarman (2007) PHP is a Server-side language that is specially designed for web applications. PHP can be inserted between the HTML language (HyperText Markup Language) and because it is a Server-side language, the PHP language will be executed on the server, so that what is sent to the browser is the finished result in HTML form, and the PHP code will no longer be visible.

2.7 MySQL

MySQL (My Structured Query Language) is a software maker and database manager, also known as DBMS (Database Management System) according to Nugroho (2014). MySQL is one type of open source DBMS.

3. METHODOLOGY

3.1 Prototyping Method

A system development technique that uses a prototype to explain the system, so that users have an overview of the system development that will be carried out is prototyping (Mulyani, 2016).

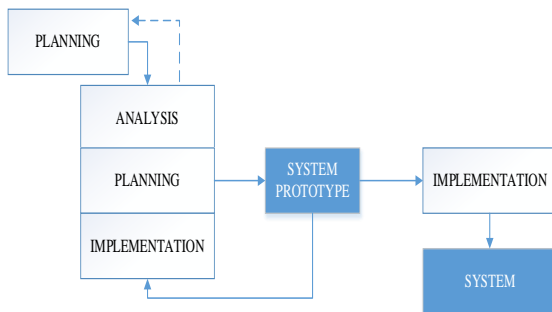


Figure 1 Stages of the Prototyping Method

Figure 1 shows the stages in the prototyping method. This method starts from planning the information system to be created which consists of defining a system request. The second stage is system analysis, system design and system implementation. System analysis is done by analyzing the current business processes to determine the functional and non-functional system requirements. Then do a system design consisting of a logical and physical system design modeling of the proposed system to be built. System modeling is done by using use case diagrams to describe system interactions, BPMN 2.0 is used to describe business processes in the UNISBA industrial engineering study program

and entity relationship diagrams are used to describe relationships between entities contained in the database. Next is the implementation of the system, namely the development of the prototype that has been made to assess the feasibility of the proposed system. If the proposed system is said to be feasible, then the proposed system can be used in the UNISBA Industrial Engineering Study Program.

4. RESULTS

4.1 System Planning

System planning is a plan for how the system will be built based on several factors that support the success of the new system.

Table 1. Consultation System Development Plan and Final Project Scheduling

System Request – Final Project Consultation and Scheduling Application
Project Sponsor: Final Project Team of Unisba Industrial Engineering Study Program
Business Needs: Both students and lecturers can access student consultation using the system and student consultation data can be stored in a database.
Business Requirements: The requirements that must be met by the system are:- - The system can store student consultation data. - The system can conduct consultation and consultation discussions
Business Value: Unisba's industrial engineering study program can improve services by enabling students to facilitate online consultation with supervisors. The business value that can be created is that supervisors can easily monitor student final assignments
Special Issues or Constraints: The Final Project Team views this problem as a strategic system, in order to prevent this project's final project monitoring problem from having to be resolved in the near future.

4.2 Business Process Analysis

Business process analysis is the first step in analyzing a system. The business processes that occur in the unisba industrial engineering study program as a whole have previously been described in 4.2 processes in the company's information system. The research was conducted in the final project section of the Unisba Industrial Engineering Study Program, especially focused on the consultation section.

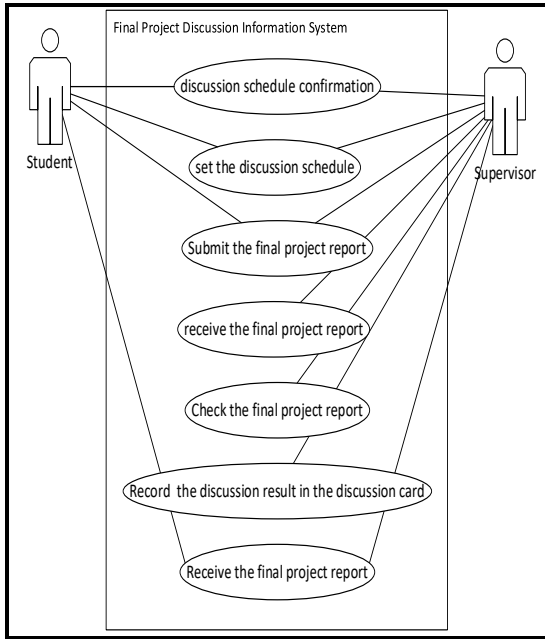


Figure 2 Final Project Consultation Use Case

4.3 Needs Analysis

Needs analysis is an analysis that is conducted based on the problems that occur to find out the needs needed by users. Needs analysis is divided into 2 parts, namely:

1. Functional requirements analysis

At this stage, a needs analysis is conducted related to the features in the application, and the things that the application can do. Functional requirements are statements of the services the system must provide, how the system reacts to certain inputs and how the system behaves in certain situations. Functional requirements describe the functions that can be performed by the system depending on the type of software in which the software is used. The functional requirements in the system that have been collected are grouped based on users. The following is table 2 showing the functional requirements for the new system.

Table 1 System Functional Requirements

No	Functional Need Student
1	The system can do consultation
2	The system can conduct consultation discussions between students and supervisors
3	The system can store consultation data
	The system can print consultation cards

Continuation Table 2 System Functional Requirements

Final Project Team / Admin	
1	The system can register new student and lecturer accounts
2	The system can display the number of students who registered for the final project
3	The system can see the progress of students' final assignments per supervisor
Lecturer	
1	The system can see the progress of the student's final project
2	The system can conduct consultation discussions between students and supervisors

2. Analysis of non-functional requirements

Non-functional requirements are additional requirements for supporting information systems, which consist of operational, security, information, performance, user and display requirements. The table 3 shows the non-functional requirements of the system.

Table 3 System Non-Functional Requirements

Non-Functional Needs	Information
Security Needs	The designed application has different user levels and to access the features in the application, it is necessary to log into the system using a username and password.
Hardware Operational Needs	Hard disk: 500GB or more RAM: 2GB or more Monitor: 14" or more LAN (Network) / Wi-Fi cable Mouse, Keyboard and Printer
Information Needs	There is information about the application usage guide
Performance Needs	Consultation can be done quickly, and consultation files, consultation discussions, and consultation results can be stored properly in the system
User Needs	Students, Lecturers, Final Project Team
Display Needs	Attractive display, easy to understand language, and animation.

4.4 Logical Design

This step is done after the system requirements have been obtained. System interaction is a process of interaction that occurs in the system which will be described using a use case diagram. Figure 3 is a use case diagram that shows the logical requirements for system interaction in the consultation process.

1. Admin inputs student data, including registering student accounts into the system.
2. Admin will allocate mentors to students who take TA
3. Students will carry out a mentoring contract, in the consultation contract system it is a re-registration.
4. Students provide consultation by accessing the final project information system.

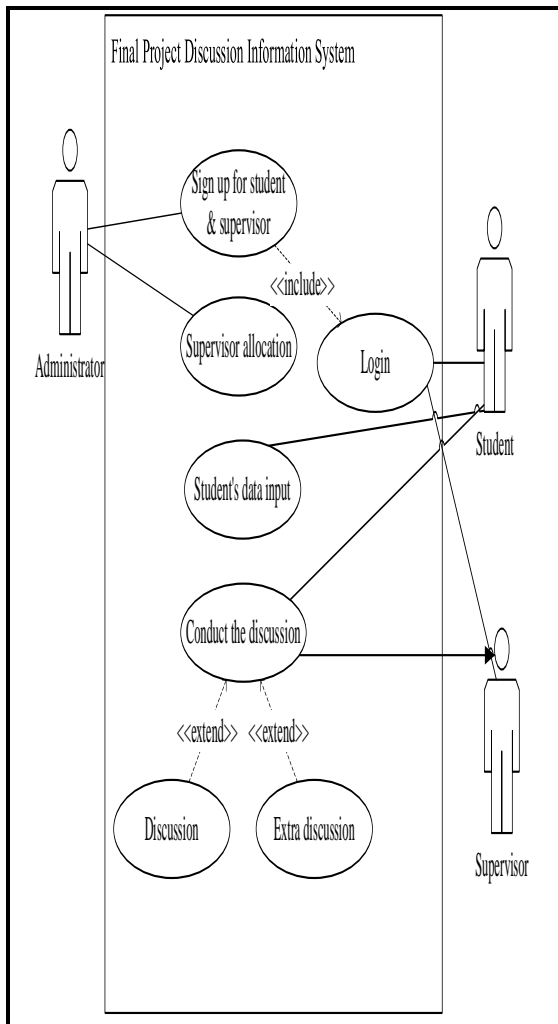


Figure 3 Use Case Logical Diagram of the Consultation Process

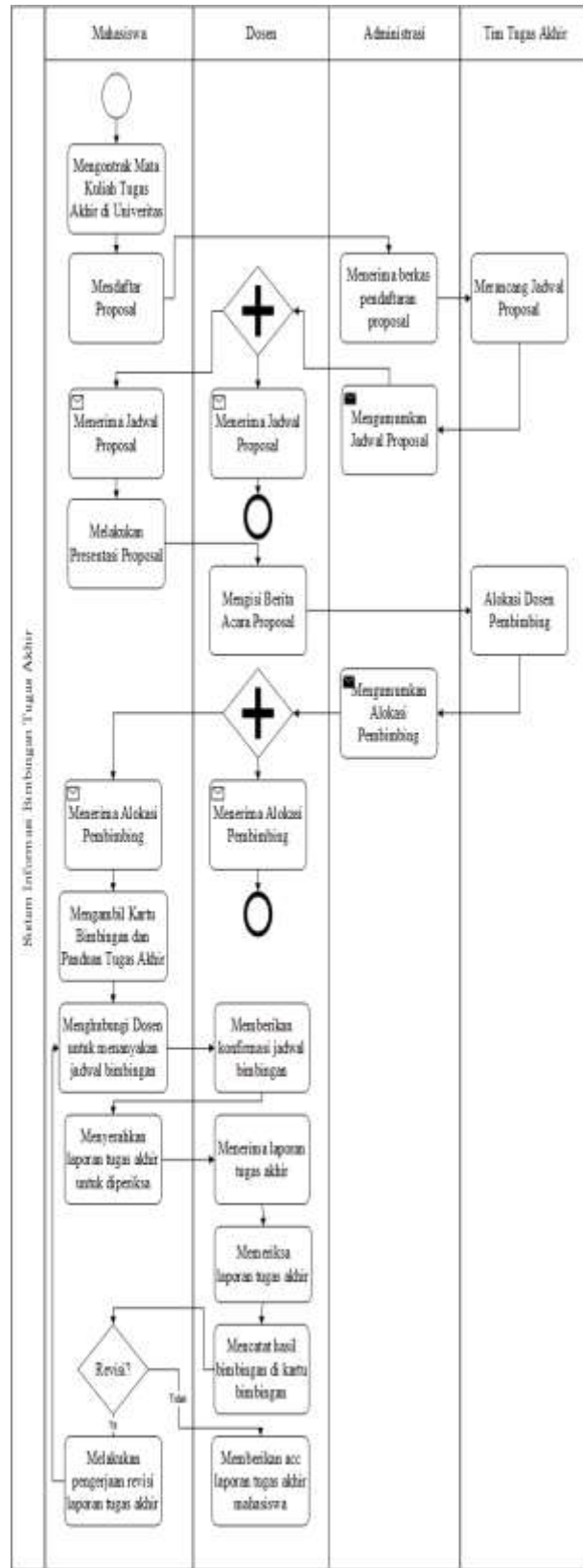


Figure 4 Current Final Project Consultation Business Process

4.4 Logical Process Design

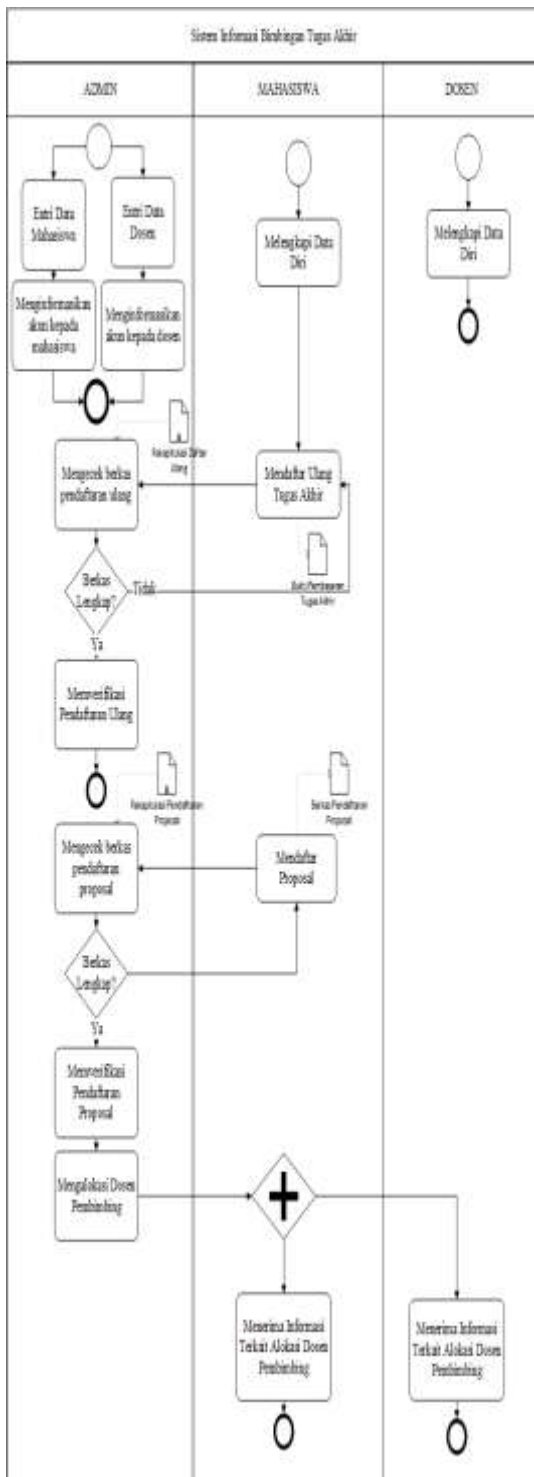


Figure 5 Logical Consultation Business Process Modeling (1)

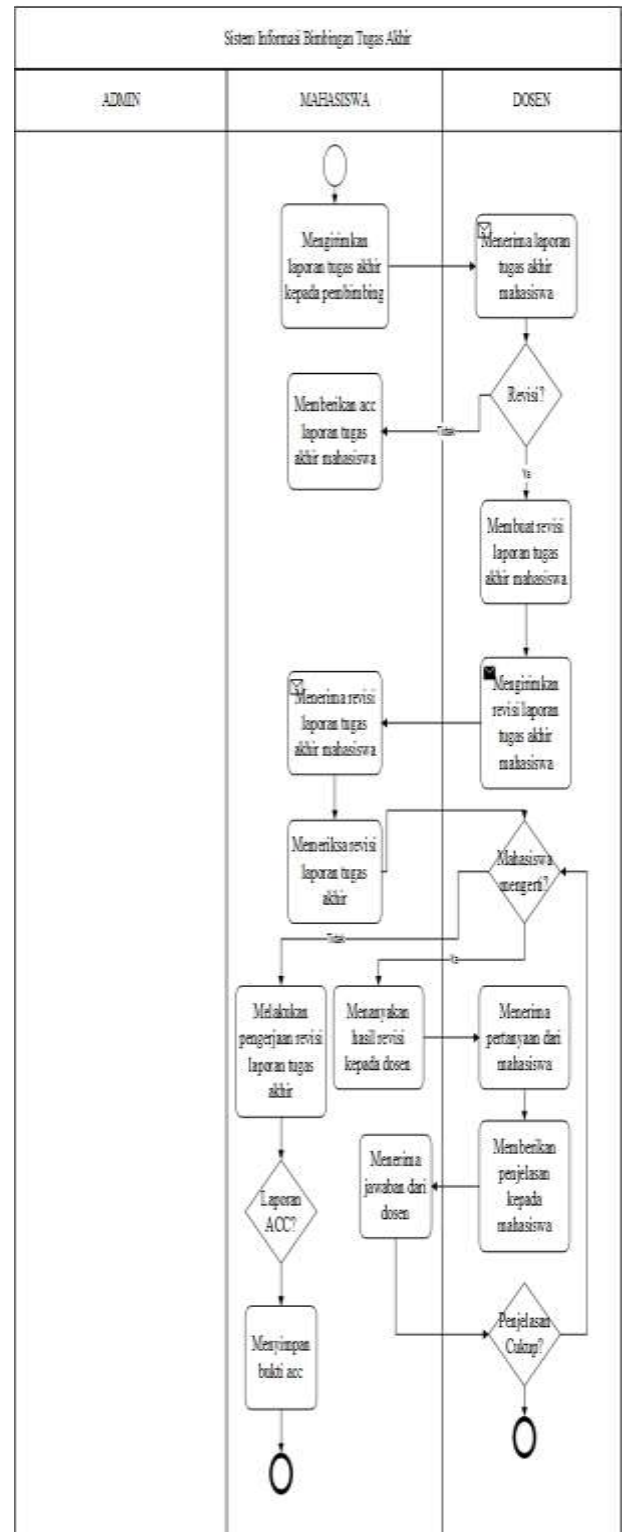


Figure 6 Logical Consultation Business Process Modeling (2)

4.6 Logical Database Design

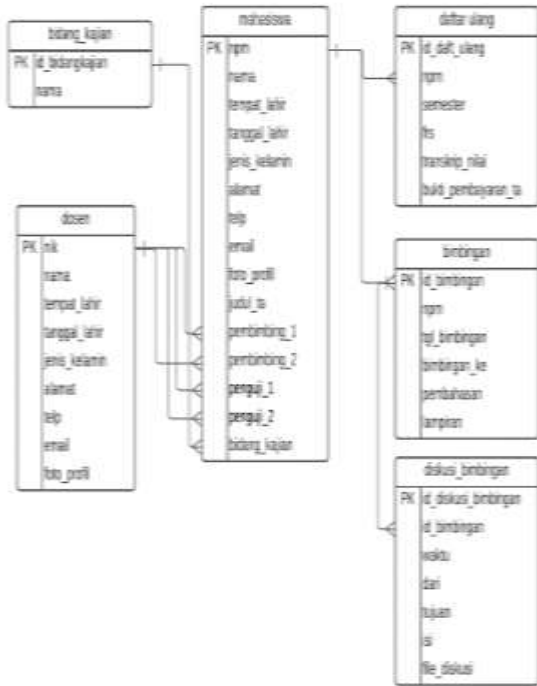


Figure 6 Entity Relationship Diagram Logical Consultation

4.5 Physical Database Design

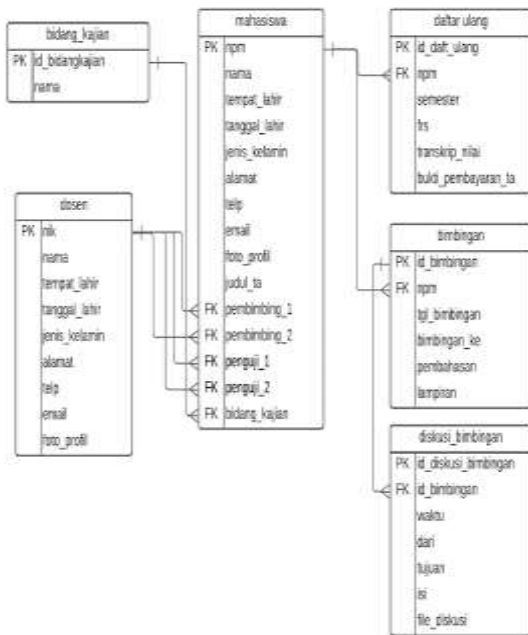


Figure 7 Entity Relationship Diagram Physical Consultation

Physical Process Design

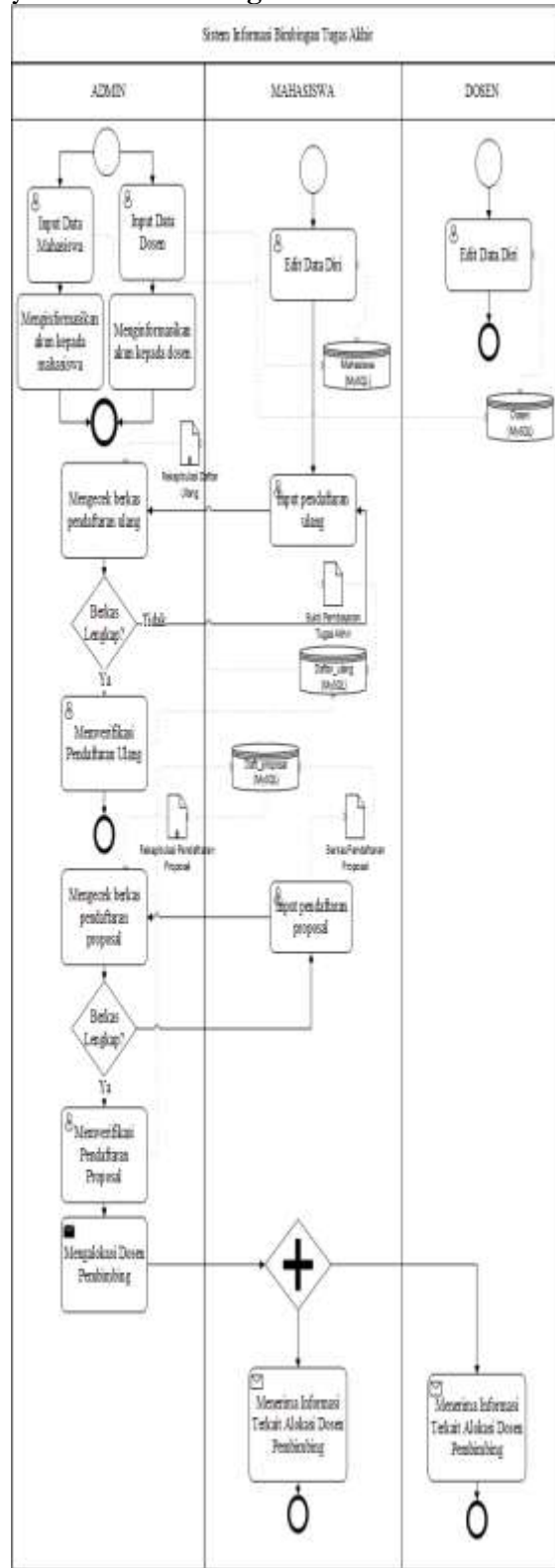


Figure 8 Physical Consultation Business Process Modeling (1)

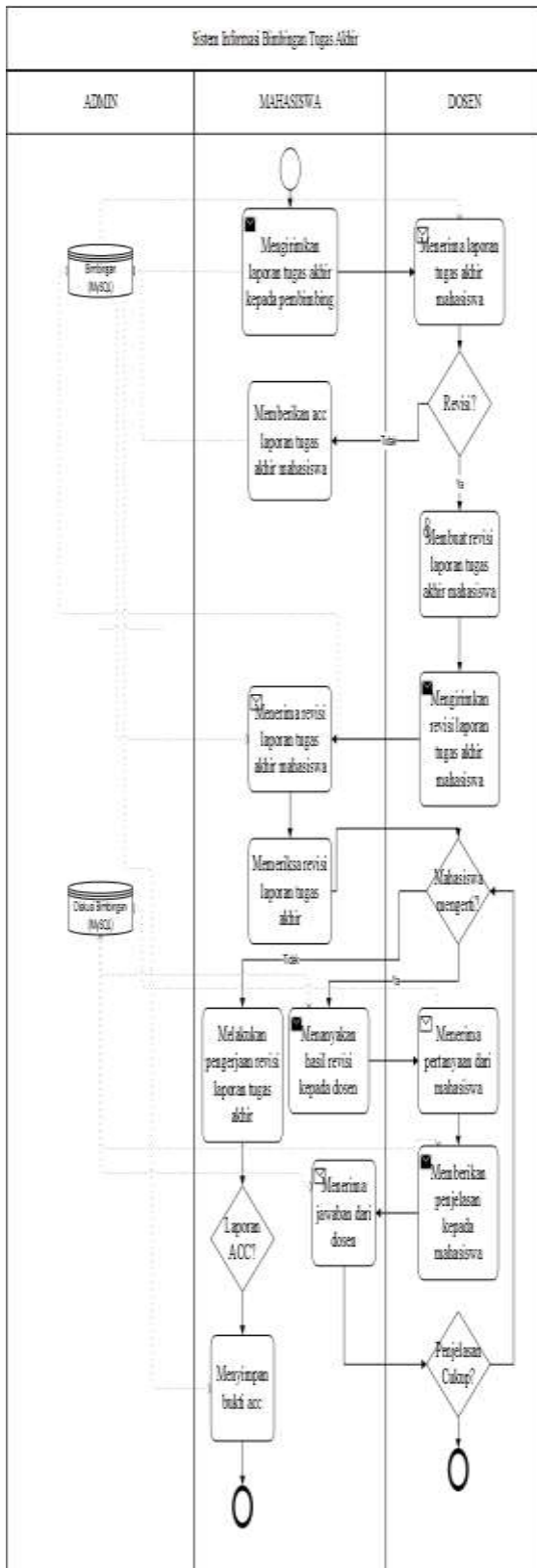


Figure 9 Physical Consultation Business Process Modeling (2)

4.6 Application Interface Development

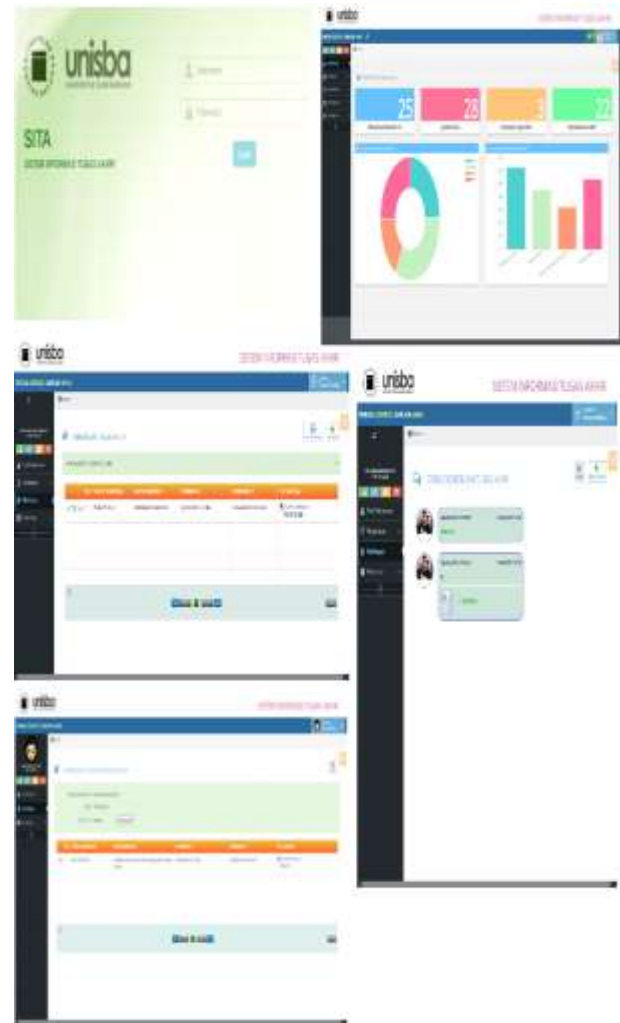


Figure 10 Final Project Consultation Application Interface

5. DISCUSSION

Based on the design results, there are changes in business processes that occur between the current and proposed conditions. In the current consultation business process, consultation is conducted face-to-face directly, where students bring a printed final project report which will be checked by the supervisor. In this process there are several weaknesses, namely, the lecturer's lack of organized explanation which often lead to the re-doing of the consultation. Another weakness is that students did not make improvements as desired by the lecturer. Lastly, the difficulty of determining schedules between students and their supervisors also became a weakness. The new system allows students to conduct tutoring anytime, and anywhere with the help of an internet connection to enter the system.

6. CONCLUSION

Based on the results of the design that has been done, the following conclusions can be drawn:

1. Business process identification is used to analyze problems and become the basis for creating new systems. There is a change in the final project business process after the implementation of the new information system, where the biggest change can be seen in the consultation process.
2. The design of the final project consultation information system makes it easier for lecturers and students to conduct consultation, where the consultation file will be well documented and the consultation card can be easily accessed to be used when needed.

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