

Information System Design for Final Project in Higher Education

Hirawati Oemar ¹
Industrial Engineering
Bandung Islamic University
West Java, Indonesia
hirawatio@yahoo.co.id

Sumarto Sumarto ²
Educational Administration
Indonesian education university
West Java, Indonesia
soemarto@upi.edu

Aan Komariah ³
Educational Administration
Bandung Islamic University
West Java, Indonesia
aan_komariah@gmail.com

Maulana Malik Ibrahim ⁴
Industrial Engineering
Bandung Islamic University
West Java, Indonesia
maulana2cool@gmail.com

Fijrina Rahma Innayah L ⁵
Industrial Engineering
Bandung Islamic University
West Java, Indonesia
fjirinrahma29@gmail.com

Mochamad Kiki Baihaki M ⁶
Industrial Engineering
Bandung Islamic University
West Java, Indonesia
mkikibaihaki@gmail.com

Abstract— The final project is one of the requirements for graduation in higher education. Several stages must be passed, namely the proposal stage, seminar, and thesis trial. Currently, for each stage students must come directly to register with the required documents. Administration performs the collection, processing, reporting, and storage of documents. Problems with storage space, loss of documents, and not being connected to computers make administrative services less effective. This study aims to design a final project information system with the prototyping method. The prototyping method is a system development technique consisting of three stages: the planning stage, in which the system is identified; analysis stage, where business processes are analyzed; the design phase, where systems, processes, logistics, and physical interactions are designed; system interface stage; and the implementation phase, where the database and website are developed using the PHP language and MySQL database. This final project information system makes the final project administration process more efficient in terms of time and resources. The results show that the design of a web-based information system with MySQL database storage media can meet every system need.

Keywords— Information System; The prototyping method; Final project.

INTRODUCTION

The Final Project is the end of the student learning process in the undergraduate program at the university. In this final project, students independently demonstrate ability, creativity, and innovation in integrating and applying the knowledge and skills acquired through the learning process during undergraduate education. Therefore, the final project is one of the graduation criteria for the Industrial Engineering study program at the Universitas Islam Bandung (Unisba). The implementation of the final project is divided into three stages, namely the proposal stage, where students will present their final project proposal in front of two examiners. Furthermore, students will get a supervisor and guide until it is stated that they are ready to attend a seminar on attending assignments. The seminar was tested by two examiners to get recommendations for feasibility as well as input or corrections to the final project material. The final stage is the final task trial. Students defend their research results in front of the two examiners until they are declared graduates.

In the three stages, students will register, collect the required documents and submit the documents to the administration. Administrative staff will collect,

check the completeness of the files, and cross-check documents with the data available in the study program. Before and after the implementation of each stage, other administrative staff will submit documents to the examiner lecturer, collect minutes of the final project presentation, and store all physical documents in the available storage area. Data related to the final project is rewritten and stored in soft copy on several administrative computers that are not connected. This situation makes the process of carrying out the final project, from registration to presentation at each stage, inefficient. In its implementation, this Final Project requires the involvement of a lot of resources and time.

This study aims to produce a design of registration information system and Final Project presentation that can support every activity in the implementation of the Final Project so that the Final Project activities become more effective, and efficient.

The design of information systems in previous studies shows that the existence of a final project information system provides convenience for students in the process of searching for final project data [1][2]. Other studies have made a final project information system using a web-based system, but some processes are still done manually [3]. This research produces an integrated information system that can be accessed online to help students and administrative staff for the Final Project. The final project information system will facilitate the final project team in storing, processing, and reporting the implementation of the final project.

RESEARCH METHODOLOGY

The method used in this research is the prototyping method, the prototype method involves the user in system analysis and design making in the development of information systems such as the system information service administration hospital [4]. Figure 1 shows the stages of prototyping information system design, including planning, analysis, design, and implementation of the created information system [5].

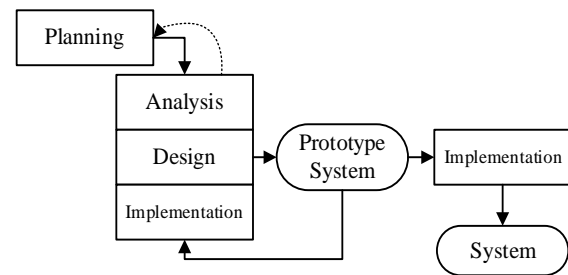


Fig 1. Prototyping method
(Source: Dennis, Wixom, and Roth, 2014)

A. System Planning

The system planning process is carried out using a system request system based on aspects of strength, information, performance, and service. The next stage is to conduct a feasibility study with aspects of technical and operational feasibility. create these components, by entering the following applicable criteria.

B. System Analysis

The analysis stage is carried out on the current information flow of the Final Project and is described using a use case diagram after it is continued with a study of functional and non-functional requirements for information systems for the Final Project.

C. System planning

System design is carried out in two stages: logical system design and physical system design. Logical system design includes logical system interaction design using use case diagrams, logical system business process design using *Business Process Model and Notation* (BPMN), and logical data system design using *Entity-Relationship Diagrams* (ERD). While the physical system design process includes the design of physical system business processes using BPMN, data system design using ERD, and application interface design using FIGMA.

Business Process Model and Notation (BPMN) is the most widely used decision and process modeling language [6]. Process models exhibit different levels of abstraction concerning the underlying business processes, depending on the purpose of the modeling. A high-level textual description of a process, including process inputs, outputs, and responsibilities, is provided at the organizational level. An operational process model is a diagram that

depicts actions, their relationships, and organizational data. BPMN divides the operational level into descriptive and analytical models. The descriptive model is used for high-level documentation, while the analytical model is used to study the process in depth. Based on this, the process model that has been built extends and modifies it to include the technical components required for implementation [7] Using clinical scenarios, this section attempts to quickly present both criteria.

Entity Relationship Diagram (ERD) is a technique used by systems analysts in the requirements analysis phase of a systems development project to simulate the data requirements of an organization. Although ostensibly a visual aid or diagram, it serves as the basis for the relational database architecture that underpins the information system under development. The data model consists of entity-relationship diagrams and accompanying details, which are then used as database definitions [8].

After defining the Entities and their Relationships for the database, Figma Wireframing is used as a tool to create a two-dimensional illustration of the page interface, focusing on designing Modern and Intuitive websites with space and priority of content, available functionality, and desired behavior. Because of this, wireframes rarely incorporate any style, color, or image [9].

Figma, a free online editing application that also allows prototyping, is used to develop prototypes. Another benefit of using Figma as a tool is its ability to provide information about the design in the form of cascading style sheets (CSS). This makes it easy for any designer to transfer styles into the app itself. Figma also allows the creation of responsive scalability for designs [10].

Use case diagram is a model that describes the risks associated with the system to be implemented. Use cases are useful for describing interactions that occur between two or more actors in a system [11]. Figure 2 shows a use case diagram for Final Project Registration.

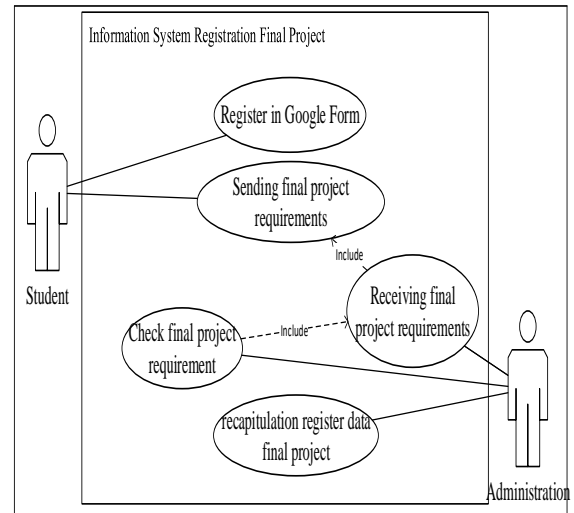


Fig 2. Use case diagram of Final Project Registration

The explanation of the Final Project registration interaction in Figure 2 is as follows:

1. Students register for the Final Project (Proposal, Seminar, and Thesis Defense).
2. Students collect registration files that have been filled in on the google form (Proposal, Seminar, and Thesis Defense) and are explained in the first point.
4. Administration of the study program receives a report on the registration of the thesis defense.
5. After the Final Project registration files (Proposal, Seminar, and Thesis Defense) are collected, the study program administration will check whether the registration requirements have been met; otherwise, the file will be returned to the student.
6. If all the files are correct and collected, the study program administration will recap the results of the Final Project registration (Proposal, Seminar, and Thesis Defense)

D. System Development

The development of this information system includes the development of data as storage media using MySQL and the application interface using the PHP programming language, with the hosting platform using the media domain and com domain. The application that has been built can be accessed online by anyone at the staunisba.com domain.

DISCUSSION

The results of this study are web-based applications,

and application development process using PHP language with data storage using MySQL. Figure 3 shows that the initial display on the information system is a login menu equipped with admin, student, and lecturer accounts.

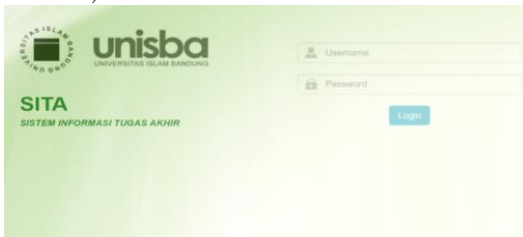


Figure 3. Login page

Figure 4 shows the admin page; in this view, it shows the dashboard related to the implementation of the Final Project and several accessible features such as a database containing student and lecturer databases; The menu aims to display and add student or lecturer account data. The registration feature aims to monitor and approve every student who registers for the Final Project (Proposal, Seminar, and Defending Thesis).

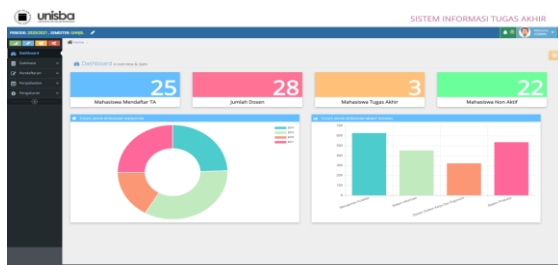


Fig 4. Admin Main Page

Figure 5 shows the student page; the display displays related student profiles, as well as several accessible features such as registration which includes registration of proposals, seminars, and thesis defenses, as well as presentation features that aim to enable students to see the schedule and results of proposal presentations, seminars, and thesis defenses in real-time. time.

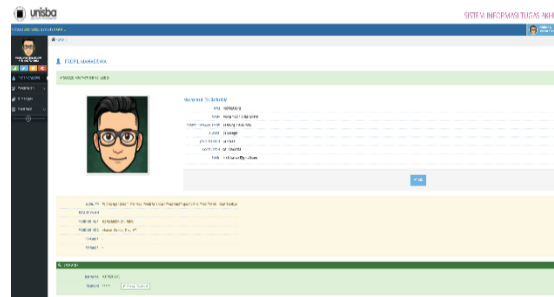


Fig 5. Student Pages

Figure 6 shows the lecturer's page; the display displays the profile of the related lecturer, as well as features that can be accessed, namely presentations which include proposal presentations, seminars and thesis defenses, presentation features that aim to enable lecturers to view schedules, provide event data and scores, and view data on proposal presentations, seminars, and presentations. . Live experiment.

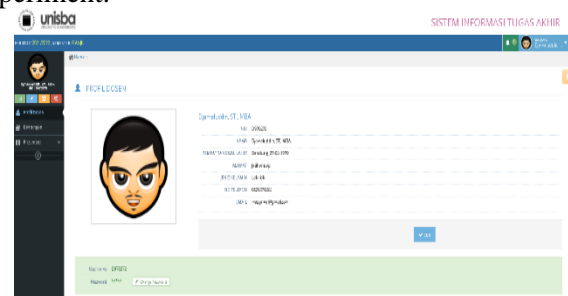
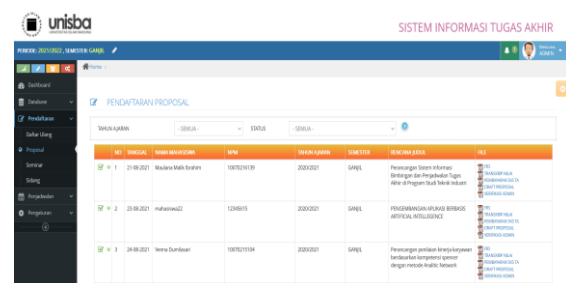


Fig 6. Lecturer Page

Proposal registration is a page that displays a database of students who have registered for proposals. The progress of the proposal registration can be seen in Figure 7.



No	Tanggal	Nama Mahasiswa	NPM	Tahun Lulusan	Semester	Rencana Kerja
1	21-08-2021	Wahana Raka Ibrahim	1987021010	2020/2021	GANES	Perancangan Sistem Informasi Berbasis Web Berbasis Tugask Akhir di Program Studi Sistem Informatika
2	21-08-2021	Mahasiswa02	12345678	2020/2021	GANES	PERENCANAAN PROPOSAL BERBASIS ARTIFICIAL INTELLIGENCE
3	24-08-2021	Nisa Durdiana	1987021014	2020/2021	GANES	Perancangan aplikasi berbasis web berbasis sistem informasi dengan metode Anlysis Network

Fig 7. Proposal Registration Page

Seminar registration is a page that displays a database of students who have registered for the seminar. The

progress of seminar registration can be seen in Figure 8.



Figure 8. Seminar Registration Page

Thesis Defense is a page that displays a database of students who have registered for the trial. The construction of trial registration can be seen in Figure 9.

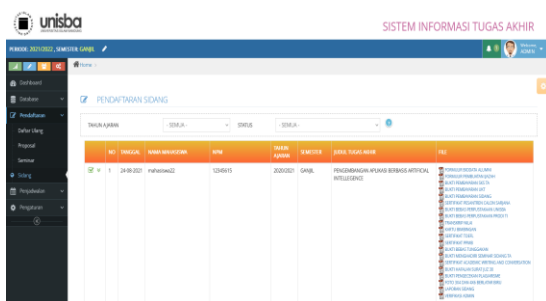


Fig 9. Session Registration Page

The research findings are analyzed in stages to determine whether the functional requirements of the system have been met. The status of the functional requirements of the final project information system in the Unisba Industrial Engineering study program is shown in Table 1.

TABLE 1. STATUS OF FUNCTIONAL SYSTEM REQUIREMENTS

Functional requirements	Status
The system can provide a login feature for each student	fulfilled
The system can register FP online (FP Registration,	fulfilled

Functional requirements	Status
Proposals, Seminars, Thesis Sessions)	
The system can store FP registration data (Registration, Proposal, Seminar, and Thesis Session)	fulfilled
The system can display the schedule and results of FP presentations (Proposals, Seminars, Thesis Sessions)	fulfilled
The system provides a special login feature for admins	fulfilled
The system can display student data who have registered for FP (Registration, Proposal, Seminar, and Thesis Session)	fulfilled
The system can make decisions regarding the status of family planning registration (Re-registration, Proposal, Seminar, and Thesis Session)	fulfilled
The system can recap the results of the FP registration (Registration, Proposal, Seminar, and Thesis Session)	fulfilled
The system can display the presentation schedule for each student (Proposal, Seminar, and Thesis Session)	fulfilled
The system can provide a recapitulation of the value of the FP presentation results automatically (Seminar and Thesis Session)	fulfilled
The system can store all data related to the FP presentation process (Proposals, Seminars, and Thesis Sessions.	fulfilled

Functional requirements	Status
The system can display the presentation schedule for each student (Proposal, Seminar, and Thesis Session)	fulfilled
The system can provide features for filling out minutes of FP Presentations (Proposals, Seminars, and Thesis Sessions)	fulfilled

CONCLUSION

Based on the research conducted, it can be concluded that the system design is to the needs that exist in the Unisba Industrial Engineering Study Program, especially the addition of a re-registration feature in the Final Project registration process, the recapitulation of presentation scores from related lecturers can be calculated automatically by the system, as well as in the easier administration in recording and searching data with an online data collection system with MySQL database

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REFERENCES

- [17] N. Renaningtias and D. Apriliani, "Application of the Prototype Method in the Development of Student Final Project Information Systems," *J. Recursive*, vol. 9, no. 1, 2021.
- [18] N. Nofirza, F. Audinda, H. Harpito, and A. Anwardi, "Development of a Final Project Information System Design in the Department of Industrial Engineering," *J. Tek. eng. J. Has. researcher. and Scientific Works. in the Offer. technology Ind.*, vol. 6, no. 1, p. 14, 2020, doi:10.24014/jti.v6i1.6511.
- [19] M. Melinda, RI Borman, and ER Susanto, "Design of a WEB-Based Public Information System (Case Study: Durian Village, Padang Cermin District, Pesawaran Regency)," *J. Tekno Kompak*, vol. 11, no. 1, p. 1-4, 2017.
- [20] J. Aprilia and M. Ihsan, "Development of Information Systems for Administrative Services for Bakti Timah Karimun Hospital Using the Prototyping Method," *9th Appl. Bus. eng. Conf.*, p. 1-11, 2021.
- [21] Dennis, A., Wixom, BH and Roth, RM, "*Systems Analysis and Design*". 6th edition. USA: Wiley. 2014.
- [22] Object Management Group, "Business process model and notation (BPMN)", v2.0.2, 2013, URL.
- [23] M. Weske, "Business Process Management - Concepts, Languages, Architectures", third ed., Springer, 2019,
- [24] M Brady, and J. Loonam, "Exploring the use of entity-relationship diagramming as a technique to support grounded theory inquiry". *Qualitative Research in Organizations and Management: An International Journal*, 5(3), 224–237, 2010, URL.
- [25] Martins Celso, Friedrich Fabiana, Tenorio Guilherme, and Martins Vinicius, "HELP US TECHNOLOGY: CREATED BY STUDENTS FOR STUDENTS" 2020. ICT. 13..
- [26] Ludvig Andersson, "Usability study of Swedish laboratory information system: User-centred design proposal for clinical microbiology LIS," CHALMERS UNIVERSITY OF TECHNOLOGY, Gothenburg, Sweden 2021.
- [27] A. Oktanto, P. Prasetyo, I. Irwan, and L. Fujiyanti. "The Design of Final Project Information System. *IJNMT (International Journal of New Media Technology)*," 8(2), 96-101. 2022. <https://doi.org/https://doi.org/10.31937/ijnmt.v8i2.2428>