

Designing a Web-Based Online Thesis Guidance Application for the Computer Science Study Program, Bina Bangsa University

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Abstract

This research aims to design a web-based online thesis guidance application for the Computer Science program to facilitate the processing of student thesis data and enhance the thesis guidance process for better completion of final thesis tasks. In the thesis guidance process of the Computer Science program, several obstacles hinder students' progress in completing their theses. These obstacles include the need for students to bring their thesis materials in physical form during conventional guidance processes. This can lead to additional issues, such as the cost of printing thesis materials for corrections by supervising professors. This research utilizes the PHP programming language with the assistance of the CodeIgniter framework and MySQL as the database. The System Development Life Cycle (SDLC) Waterfall method was employed for the software development phase of this research. This method was chosen because it is a simple and linear classic model, where the output of each stage becomes the input for the next stage. Data collection techniques in this research included observation, interviews, and literature studies. This research results in a web-based online thesis guidance application that provides convenience for both students and supervising professors in conducting thesis guidance. This application also assists the Computer Science program and its students taking thesis courses. The application is more efficient when conducted online, minimizing wasted paper printouts and saving time during the guidance period, ensuring that the thesis report can be completed promptly.

Keywords: application, thesis guidance, computer science, web.

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1. Introduction

Internet is one of the fastest growing technology, internet presence provides convenience in receiving and accessing information in various formats from all over the world. One element in the Internet is a web site, currently the website can not only serve as a medium of information but a variety of learning systems can be done on the internet (Henderi et al., n.d.).

Information technology and information systems allow an educational institution to develop an academic service. Services to collect, enter, process and store data to achieve the goals set by an organization (Januariani & Aziz, 2023). Agencies engaged in education also need support from information systems to improve services. The application information technology can increase the effectiveness and efficiency of work (Maghfiroh et al., 2020). Therefore, information technology is widely applied by various organizations (Jiang et al., 2020). Higher education, an organization that offers services, should be able to meet the services expected from users for the educational process, such as website-based online thesis guidance applications (Saputra et al., 2022). The final project or thesis is a final assignment that must be completed by a student who will graduate from the level of undergraduate education or diploma at a university. In working on the final project, students need to consult or guide the supervisor appointed by the final project coordinator. This aims to help students work on the Final Project more directed and focused to achieve the expected results (Aliftiar & Hibatullah, n.d.).

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Currently, the thesis guidance process in the Bina Bangsa University Computer Science Study Program is that students are guided by two supervisors, students who want to do thesis guidance must make a joint agreement schedule first with the supervisor (Sukiman & Jimmy, 2022). Then students come to campus to meet the supervisor at a predetermined time by bringing their final project. When in the Thesis Guidance Process many students are negligent of the time given by the supervisor in working on their thesis, and because of that many students urge the supervisor for guidance, because the time to do the trial is approaching (Zufriah, 2023). After the thesis guidance process is complete, the student submits the thesis guidance sheet form to the supervisor to be signed (Darmawan & Musril, 2021). However, sometimes students do not bring the guidance form when going to guidance, and also sometimes students or even their supervisors forget when they have to hold guidance. This can hinder students in doing their final project.

So on this basis, in order to support the progress of the Bina Bangsa University Computer Science Study Program, it is necessary to design a thesis guidance application (Zhang et al., 2006), which can help solve the problems faced in the thesis guidance process in the Computer Science Study Program at this time by applying information technology so that it can work like face-to-face thesis guidance with system intermediaries (Wang & Hao, 2017). This thesis guidance application will be built with website-based technology in order to serve the thesis guidance process online (Oktafiantoro et al., 2023). Selection of website-based technology because it can be accessed through a browser with the internet and can be accessed anytime and from anywhere.

This research aims to design a web-based online thesis guidance application in the Computer Science study program to be useful for facilitating the processing of thesis data for Computer Science study program students and carrying out the thesis guidance process so that the process of completing the thesis final project can be better (Zhenming et al., 2003).

Based on the exposure to the background, there are two problem identifications to be solved in this study (Kusuma, 2018). First, the process of guiding students' final assignments is still conventional. Students who want to guide their thesis must make a meeting schedule with the lecturer first with the supervisor and bring the final assignment guidance form to be submitted, this is the driving force for the need to develop a website-based online thesis guidance application (Johan et al., 2023). Second, the development of a website-based online thesis guidance application is still limited to students of the Bina Bangsa University computer science study program. Bina Bangsa University students really need a website-based online thesis guidance application that can facilitate and *streamline* the time and energy of students who want to do final project guidance.

2. Method

In this research, the method used is System Development Life Cycle (SDLC) Waterfall. This method was chosen because the Waterfall Model is a systematic and sequential information system development model (Haniva et al., 2023). So that the output of the previous stage is the input for the next stage. Figure 1 shows the flow of the research framework in which there are stages of SDLC Waterfall (Wahid, 2020). The waterfall method supports the principle of application development that focuses on structured development (Handayani & Salam, 2023).

The following is an explanation of Figure 1:

a. Interview & Field Observation

At this initial stage, the author collects information in the field related to problems in the bina bangsa university computer science study program through interviews / direct dialogue with sources. While the interview method is used to complement data and information that has not been obtained in the observation method (Mekarisce, 2020).

b. Literature Study

Collect all information related to the topic being researched from various sources. In this case, the information that must be collected is about thesis guidance, websites, and Waterfall SDLC for the development of web-based online thesis applications.

c. Analysis

This stage is an identification of the system about what needs are needed, starting from functional needs. Functional Requirements Analysis Is a type of requirement that contains the processes carried out by users.

d. Design

Is an advanced stage of analysis, where at this stage a design will be presented, namely the Entity Relationship Diagram (ERD) is a technical approach model that states or describes the relationship of a model between data.

e. Coding

At this stage the author will implement the previous design by applying the interface into the PHP programming language for the website.

f. Testing

Testing is a critical element in determining the quality of software that includes design, specification, and coding.

g. Maintenance

It is possible that a system will experience changes when it is used by users. Changes can occur if there are errors or developments in the system.

h. Conclusions and Suggestions

This stage is the last stage in the research framework. The author will provide conclusions based on the results of the research and constructive suggestions for the future.

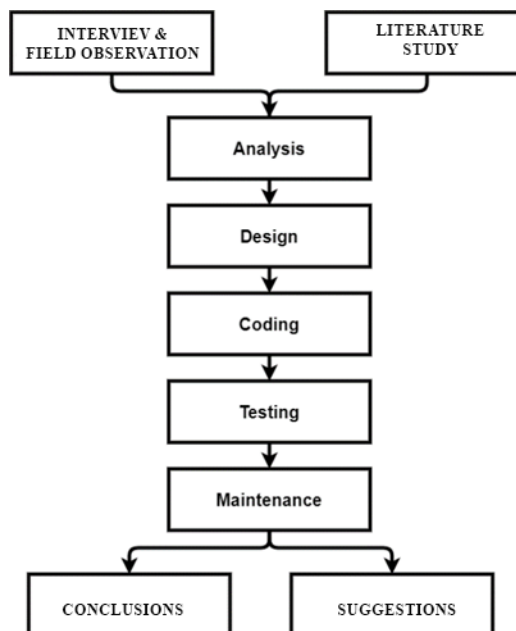


Figure 1. Research Framework

This system design uses the UML model with several tools that will be used to illustrate the system to users so they can interact with and understand the system being created (Profesi & Henderi, 2018). There are Use Case diagrams, Class diagrams, and Activity diagrams.

The Use Case diagram illustrates how this system can be used by users or actors who will be involved in the thesis guidance information system. Figure 2, the representation of the use case diagram of the system.

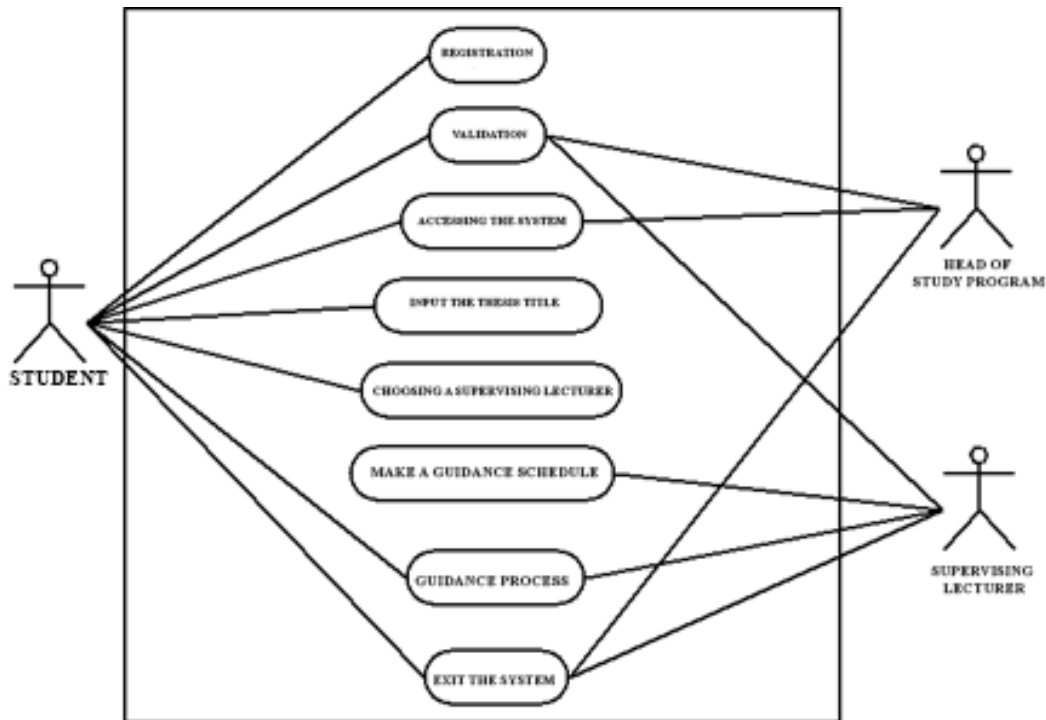


Figure 2. Usecase diagram

In the next design phase, a Class Diagram is used. The Class Diagram is used to illustrate the relationships between classes and the structure of objects with one another. The Class Diagram for this system shown on Figure 3.

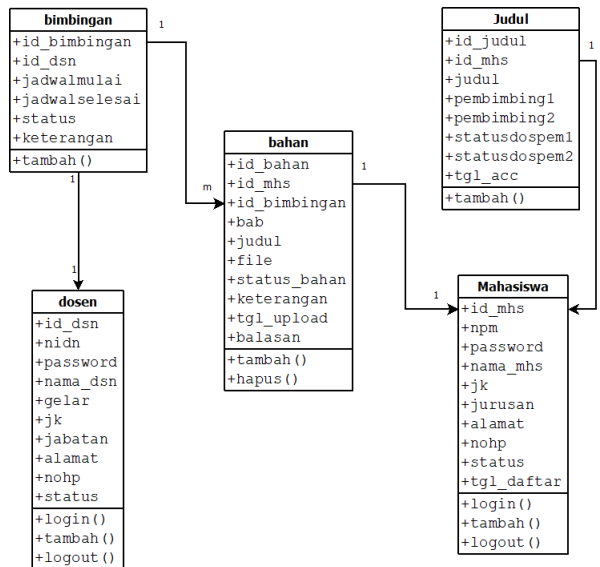


Figure 3 . Class diagram

Next, in designing this system, an Activity Diagram is needed. The Activity Diagram is used to illustrate the flow and control model of the system and other activities. The Activity Diagram for this system shown on Figure 4.

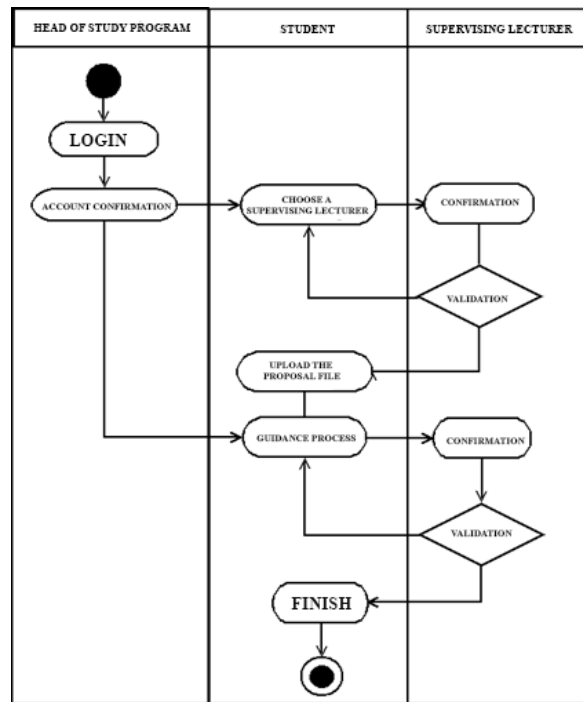


Figure 4. Activity diagram

3. Results and Discussion

Designing a web-based online thesis guidance application for computer science study programmes Needs analysis is the first step to determine the software produced (Sugimin & Wibowo, 2023). Software that is suitable and meets the standards of user needs is highly dependent on the success in conducting needs analysis (Pratomo & Mantala, 2016).

The results of the analysis are shown in Table 1 which analyses the needs of admins, lecturers, and students.

Table 1. The results of the analysis

Needs Analysis	
User	Function
Admin	Admins have access rights to register users, admins can change, and delete student data and lecturer data. And the admin can also monitor the progress of student guidance.
Lecturer	Lecturers can view the lecturer's data, lecturers can view profile data, lecturers can add, view, change and delete the list of guidance students, lecturers can approve student data that registers an online guidance ID, lecturers can approve thesis title requests submitted by students, lecturers can approve online guidance requests that have been submitted by students, Conduct two-way interaction via live chat with students, lecturers can download student guidance history.
Student	Students can register members, can view profile data, register an online guidance ID, submit a thesis title, submit online guidance, have two-way interactions via live chat with lecturers, students can view online guidance history, can also download guidance sheets.

3.1. Entity Relationship Diagram Design

In Figure 5 is a diagram of entity relationships in the Web-Based Online Thesis Guidance Application for Students of the Bina Bangsa University Computer Science Study Programme.

The function of ERD is to document existing data by identifying each type of entity and its relationship (Prehanto et al., 2020). In the ERD image above, there are seven entities that have three relationships and several attributes that are interconnected and related. For example, the student entity has several entities such as id, name, nim and id_prodi.

3.2. Display of Web-Based Online Thesis Guidance Application

Website interface design is a detailed explanation that must be made to define part of the display in designing the web display. The following is a display of the Web-Based Online Thesis Guidance Application programme.

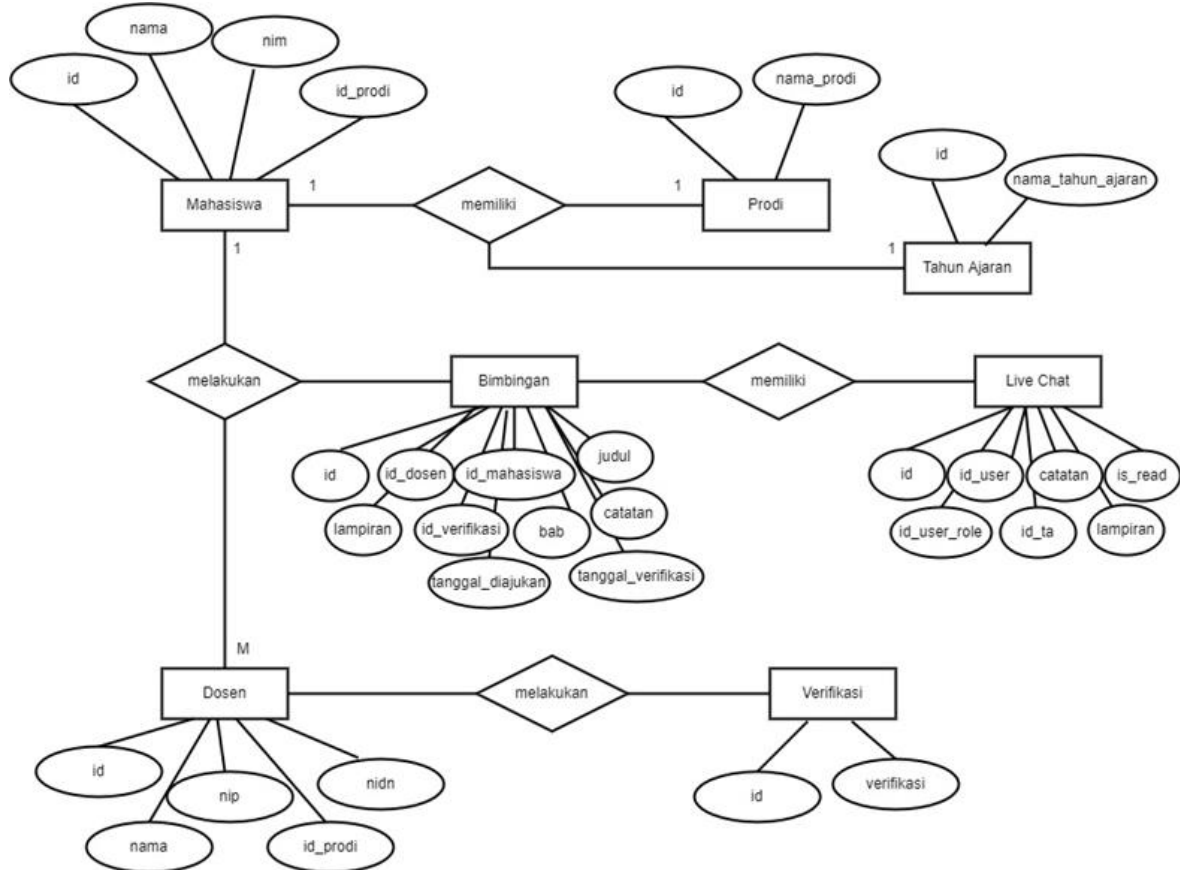


Figure 5. Entity Relationship Diagram Design

3.3. Main Index Interface Design

a. Login Page

In Figure 6 the login page there are several elements that exist in the user interface, input e-mail and password, login button to enter the application (Henderi et al., 2021).

Figure 6, this page admin, lecturer or student can login and fill in email and password to enter the dashboard page.

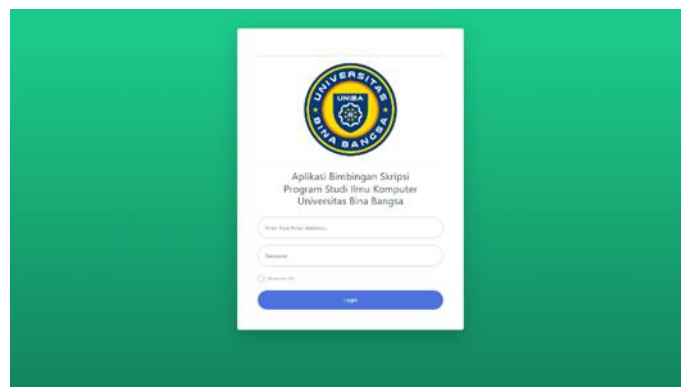


Figure 6. Login Page

This Login page is a page that contains data that users will enter to access data into the system and the system will be able to find out who enters the Thesis Guidance Administration based on the inputted data.

b. Student Registration Page

In Figure 7, this page students can register for an account.

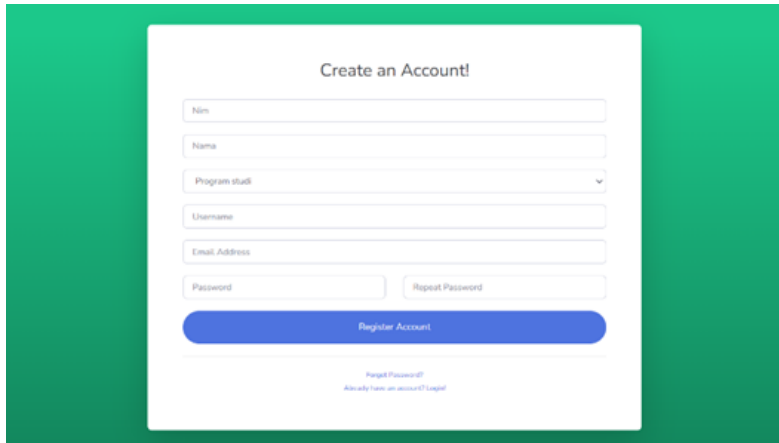


Figure 7. Student Registration Page

The student registration page functions to register students who will register for a thesis, there are several fields that must be filled in such as Nim, Name, Study Programme, Username, Email Address and Password for thesis guidance account registration.

3.4. Admin Interface Design

a. Admin Dashboard Page

In Figure 8, this is the Admin dashboard page

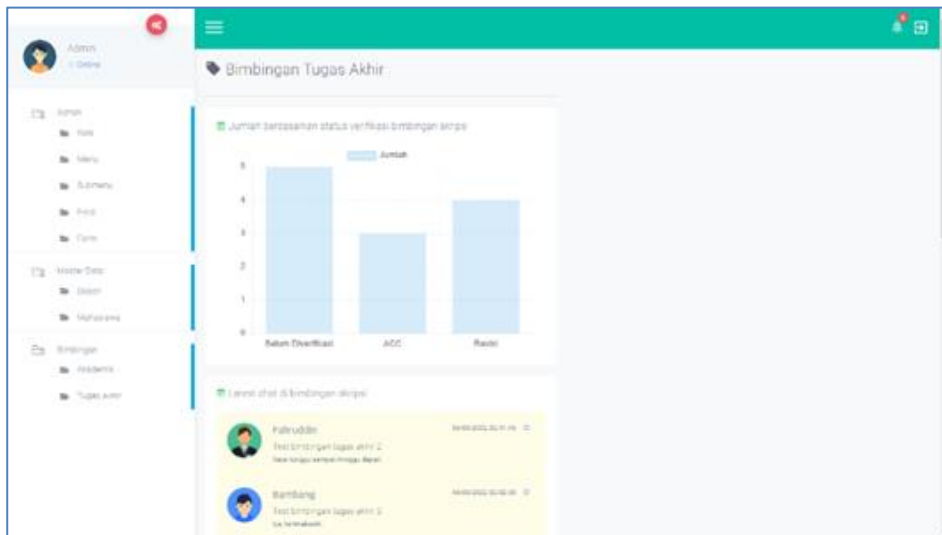


Figure 8. Admin Dashboard Page

The admin login page can be accessed by the admin who is fully responsible for the website-based online thesis guidance application username and password he has.

3.5. Student Interface Design

a. Student Dashboard Page

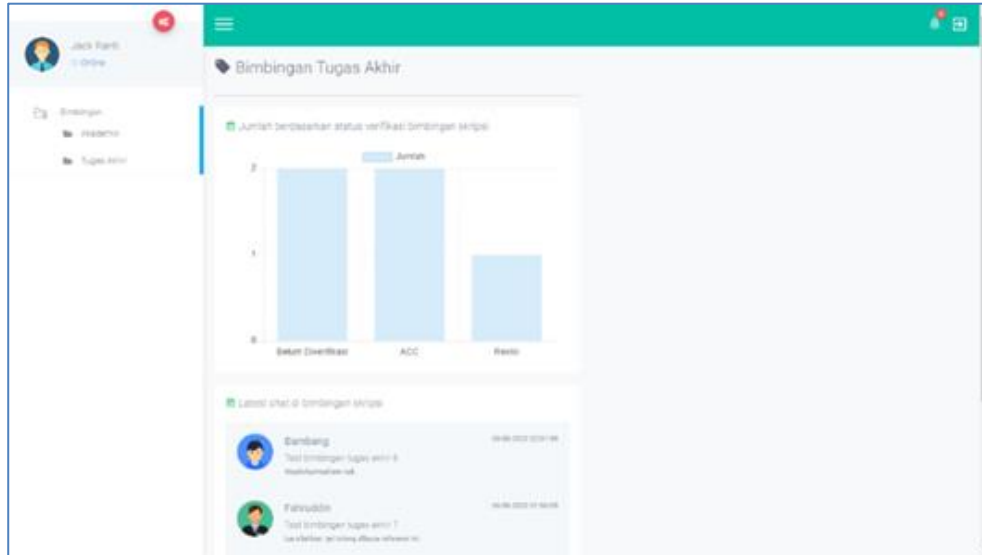


Figure 9. Student Dashboard Page

In Figure 9 this page contains the initial appearance of the student dashboard which serves to view the features available on the student dashboard students can also interact with the supervisor through the Live Chat feature available in the student dashboard.

b. Online Guidance Page

In Figure 10 of this page, students can see the guidance history and can submit guidance.

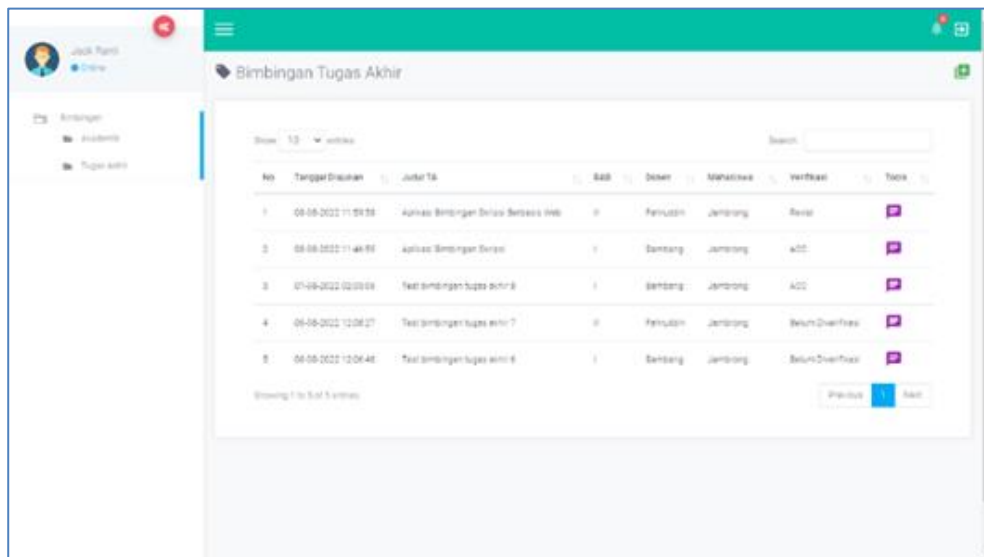


Figure 10. Online Guidance Page

This display shows the guidance interaction between lecturers and students, there is a date submitted and the final project title submitted in the design of a website-based online thesis guidance application at Bina Bangsa University.

c. *Online Guidance Page (Guidance Submission)*

In Figure 11 of this page students can submit a submission for guidance to the supervisor.

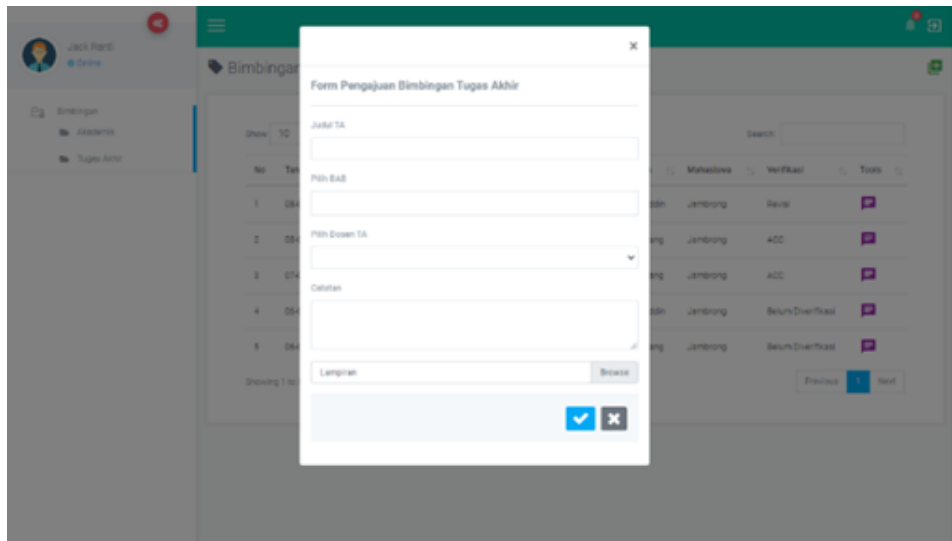


Figure 11. Online Guidance Page (Guidance Submission)

This display functions as a form for submitting student final project guidance where students can input the final project title, select chapters, select a supervisor, notes and attachments.

d. *Online Guidance Page (Guidance Process Via Live Chat)*

In Figure 12 of this page students can interact via live chat with the supervisor.

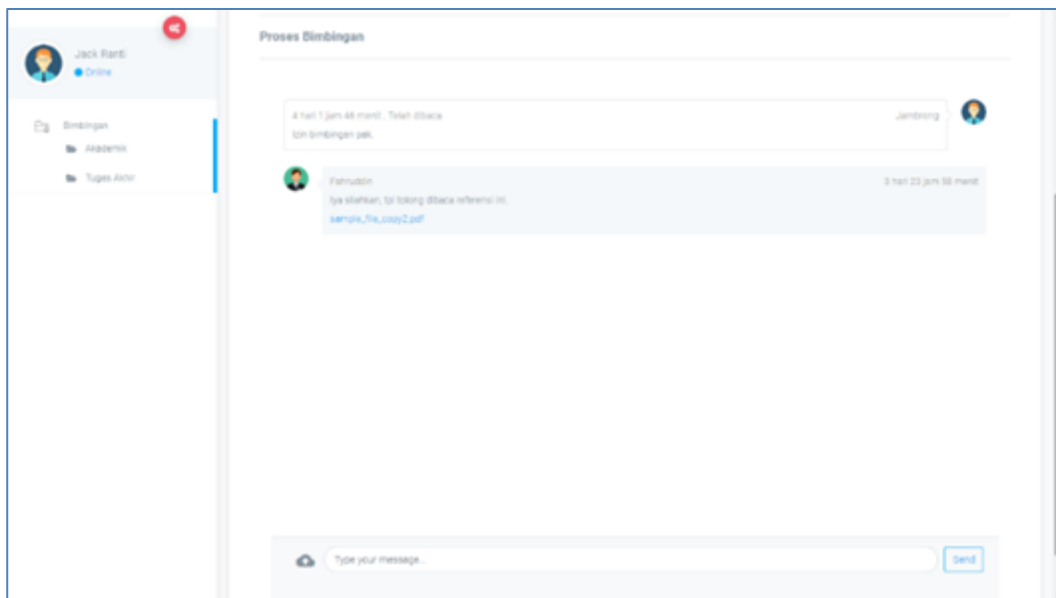


Figure 12. Online Guidance Page (Guidance Process Via Live Chat)

This page functions for students and lecturers to interact with each other so that students and lecturers can interact directly through the Live Chat feature available so that students do not have to come to campus to do thesis guidance.

e. *Online Guidance Page (Export Guidance History)*

In Figure 13 of this page students can print the guidance history report.

No	Tanggal Diupload	Judul TA	BAB	Dosen	Mahasiswa	Verifikasi	Tindakan
1	21-08-2022 02:11:24	Perencanaan Website Komite Olahraga Nasional Indonesia (KONI) Kabupaten Serang	I	Abdul Halim, S.Kom., M.Kom.	Dang Darmawan	Revisi	
2	11-08-2022 04:43:31	Aplikasi bimbingan skripsi	I	Bambang, S.Kom., M.Kom.	Ahmad Shafiq	Revisi	
3	10-08-2022 07:34:55	Quize Hari Kedua Ujian Sekolah	I	Bambang, S.Kom., M.Kom.	Japark	Belum Diverifikasi	
4	08-08-2022 11:59:58	Aplikasi Bimbingan Skripsi Berbasis Web	II	Fahrudin, S.Kom., M.Kom.	Jambrong	Revisi	
5	08-08-2022 11:46:59	Aplikasi Bimbingan Skripsi	I	Bambang, S.Kom., M.Kom.	Jambrong	ACC	
6	08-08-2022 02:30:22	Test bimbingan tugas akhir 9	II	Fahrudin, S.Kom., M.Kom.	Japark	Belum Diverifikasi	
7	07-08-2022 02:03:06	Test bimbingan tugas akhir 8	I	Bambang, S.Kom., M.Kom.	Jambrong	ACC	
8	06-08-2022 12:08:27	Test bimbingan tugas akhir 7	II	Fahrudin, S.Kom., M.Kom.	Jambrong	Belum Diverifikasi	
9	06-08-2022 12:05:46	Test bimbingan tugas akhir 6	I	Bambang, S.Kom., M.Kom.	Jambrong	Belum Diverifikasi	
10	05-08-2022 11:49:33	Test bimbingan tugas akhir 5	II	Fahrudin, S.Kom., M.Kom.	Fadel	Belum Diverifikasi	

Figure 13. Online Guidance Page (Export Guidance History)

This page functions so that students can see in detail what they have gone through when doing thesis guidance in this application starting from the date of submission of the final project to verification of the final project, and this report can be printed in pdf form.

3.6. Lecturer Interface Design

a. Dashboard Page

Figure 14 is a page that shows the lecturer dashboard.

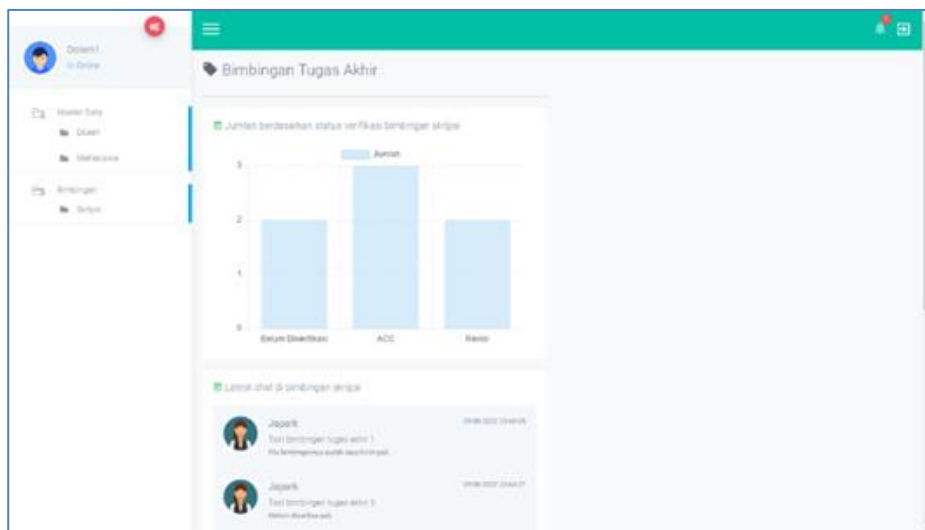


Figure 14. Lecturer Dashboard Page

In Figure 14 this page contains the initial view of the lecturer dashboard which serves to view the features available on the lecturer dashboard, lecturers can also interact with students who want guidance through the Live Chat feature available in the lecturer dashboard.

b. Online Guidance Page

In Figure 15 this page Lecturers can view incoming guidance submissions and can verify guidance status.

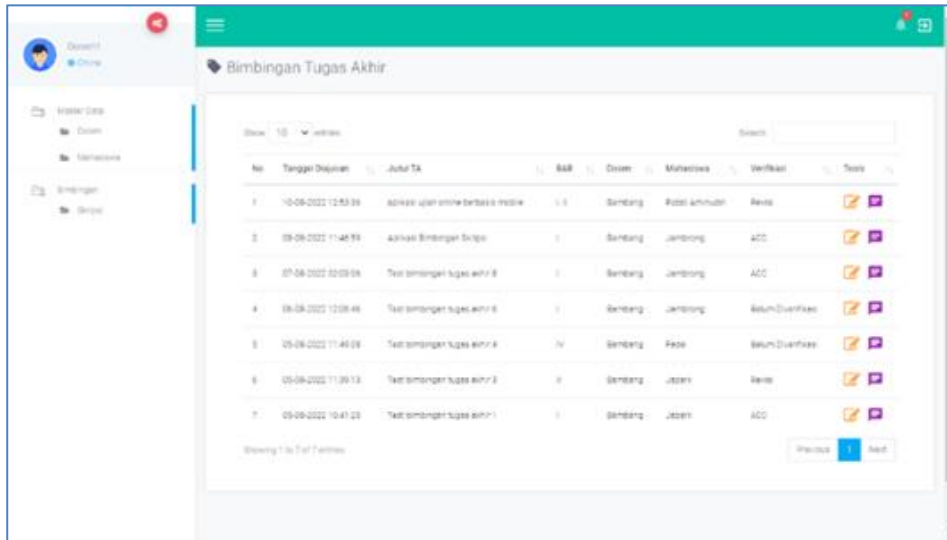


Figure 15. Lecturer Online Guidance Page

This display shows the guidance interaction between lecturers and students, there is a date submitted and the final project title submitted in the design of a website-based online thesis guidance application at Bina Bangsa University.

c. Online Guidance Page (Guidance Verification)

In this section, the lecturer verifies the guidance with the revision status and ACC.

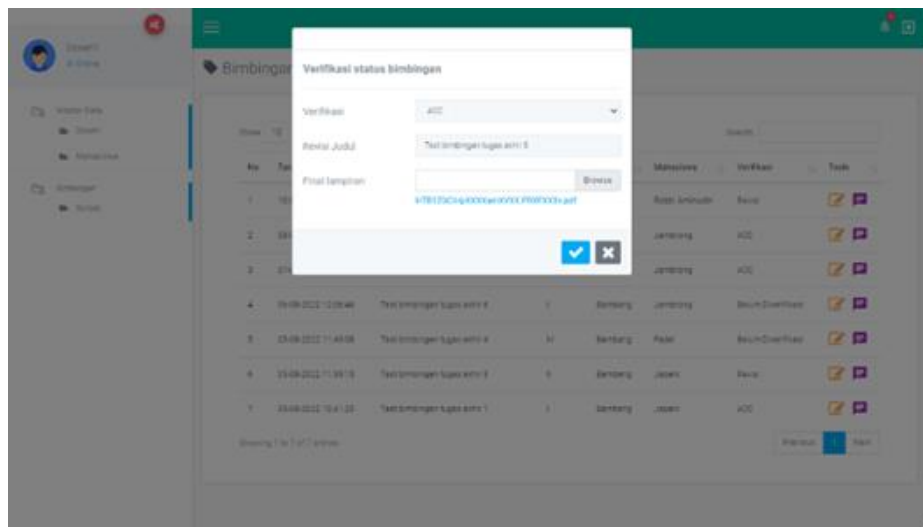


Figure 16. Online Guidance Page (Guidance Verification)

In Figure 16, it contains verification of guidance status where lecturers can verify student final assignments ranging from revision status to ACC status or final assignments suitable for trial.

d. Online Guidance Page (Guidance Process Via Live Chat)

In Figure 17, lecturers can conduct guidance with students through the live chat feature available.

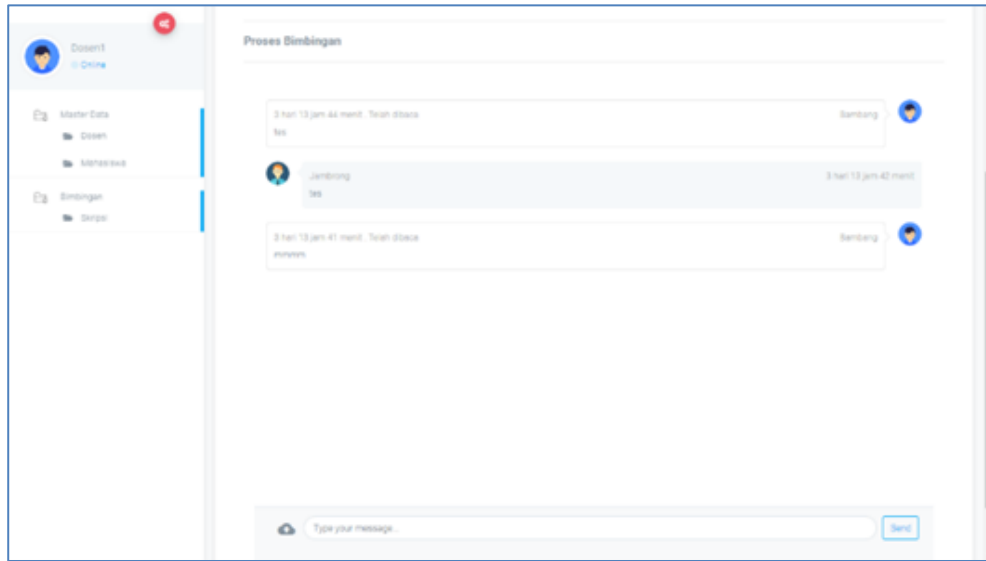


Figure 17. Online Guidance Page (Guidance Process Via Live Chat)

This page functions for lecturers and students to interact with each other so that students and lecturers can interact directly through the Live Chat feature available so that students do not have to come to campus to do thesis guidance.

e. Online Guidance Page (Export Guidance History)

In Figure 18 this page lecturers can download a list of students who are mentored. And can see the progress of student guidance.

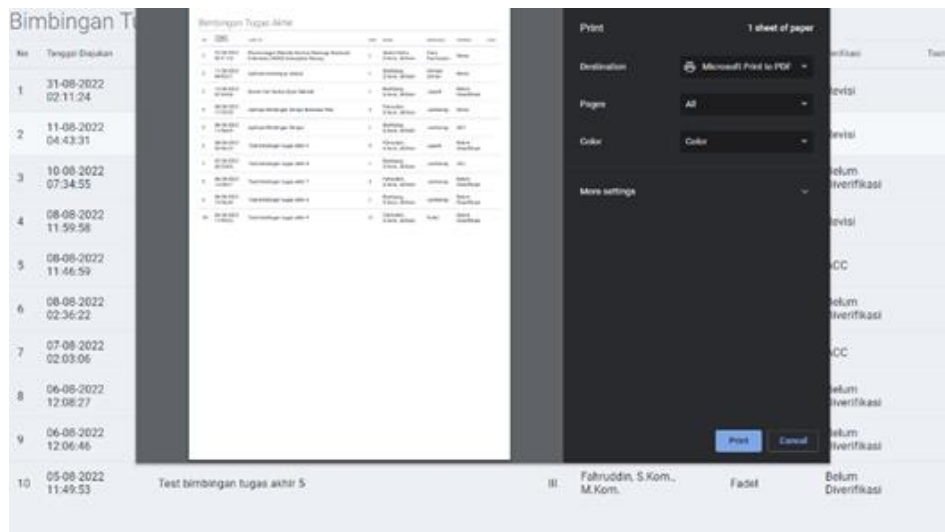


Figure 18. Online Guidance Page (Export Guidance History)

This page functions so that lecturers can see in detail what has been passed when their mentored students are guiding the thesis in this application starting from the date of submission of the final project to verification of the final project, and this report can be printed in pdf form.

4. Conclusions

The online thesis guidance application can help the process of making a thesis in the Computer Science Study Programme in several parts, namely thesis data documentation, 2- way realtime guidance between lecturers and

students, submission of guidance by chat method equipped with file attach features, guidance charts, export of guidance results data (copy, excel, csv, print, pdf) etc.. So that it is more efficient by being done online and minimising wasted paper printouts with the effectiveness of time which impacts on the guidance period so that it is not too long in completing the thesis report.

Based on the above conclusions and after seeing the results of the research that has been carried out, the researchers can put forward suggestions that can be taken into further consideration regarding the Design of Web-Based Online Thesis Guidance Application for Bina Bangsa University Computer Science Study Program as for the following suggestions: 1) The application of the system Web-Based Online Thesis Guidance Application for Bina Bangsa University Computer Science Study Programme requires adjustment time, to switch to the system can be done gradually; 2) It takes time and skilled labour to implement. experts so that this system can run well; and 3) Web-Based Online Thesis Guidance Application for Bina Bangsa University Computer Science Study Program still has shortcomings, for the future so that this system can be carried out development at Bina Bangsa University Computer Science Study Programme.

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