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Web-Based and QR-Code Thesis Information System in the Faculty of Computer Science University Bina Darma

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Abstract

Information systems as part of the development of information technology are needed to shape the performance of an agency. Currently, the thesis data of the Faculty of Computer Science at Bina Darma University is not well structured because there is no system that regulates it so that it cannot be used by students and lecturers to view thesis data for the Faculty of Computer Science at Bina Darma University. This often makes students experience several problems such as the difficulty of finding references for thesis references for alumni of the Faculty of Computer Science because there is no system that regulates and stores student thesis data, so we need a web-based system to make it easier for students and lecturers to see a collection of thesis for alumni of the Faculty of Computer Science. In developing this system using the Web and QR Code so that it can help students and lecturers in searching for thesis data quickly. The system development method that the author uses is the waterfall method. This system uses the PHP programming language and as a user interface design for the database using XAMPP with Mysql as the server configuration. The output produced from this development is an information system that can provide information in the form of a collection of thesis of the Faculty of Computer Science by utilizing the Web and QR Code.

Keywords
Information System, Thesis; Waterfall; Web; QR Code

I. Introduction

Currently, the need for precise and efficient information is increasingly needed along with the rapid development of information technology. This encourages the public and agencies to take advantage of information technology. One of these information technologies is information systems. Information systems as part of the development of information technology that is needed to form the performance of an institution [1]. Organizing information that is carried out regularly, clearly, accurately, and efficiently and can be presented in a report, of course, is very supportive of the agency's operational activities and making the right decisions. Bina Darma University is an educational institution having its address at Jalan Jenderal Ahmad Yani Number 3 Palembang. This university is one of the private universities in Palembang that has implemented IT facilities for use by existing human resources both for lecturers, employees and students as a supporting tool to facilitate the process of existing activities. Some of its IT facilities are in the form of a website that is used to provide information about history, announcements, news and other general information about Bina Darma University. Information System (SISFO) that provides information on teaching schedules, student academic scores and student payment codes. E-Learning that provides information about lecture materials given by lecturers to students and sending assignments from students to lecturers. Bina Darma University has several faculties, one of which is the Faculty of Computer Science majoring

in Information Systems and Informatics Engineering. At each university, final semester students are required to write a thesis as a condition for completing their education in college. Thesis is a scientific work written by undergraduate students discussing a particular topic or field based on the results of a literature review written by experts, the results of field research, or the results of experimental development [2]. Currently, the management of the database for the collection of thesis titles of the Faculty of Computer Science at Bina Darma University is not well structured because there is no system that can be accessed by students and lecturers to view the data collection of the titles of the thesis titles of the Faculty of Computer Science at Bina Darma University. This often makes students experience several problems, such as the difficulty of finding references to the thesis of the alumni of the Faculty of Computer Science because of the large number of theses each year, it is necessary to have a web-based system to view the collection of thesis collections of the alumni of the Faculty of Computer Science so that they can be accessed and read. online by students and lecturers. This system also uses a QR Code to make it easier for students and lecturers to quickly access thesis searches, by using a qr code we can find a thesis directly without the user bothering to type the title of the thesis on the system, just with a small patch of a symbol on the thesis. This QR-Code also functions to provide a security system for the thesis so that only students and lecturers of Universita Bina Darma can access it. QR Code is a two-dimensional form that can represent data in the form of writing in a code. QR Code is an update on a barcode that has one dimension then developed as a two-dimensional form [3]. Based on the description above, in this study the author is interested in compiling a thesis with the title "Web-Based Thesis Information System and QR-Code at the Faculty of Computer Science, Bina Darma University".

II. Research Method

2.1 Research Object

The time of this research starts from December 2021 to March 2022. This research was conducted at the Faculty of Computer Science, Bina Darma University Palembang, Jalan Jenderal Ahmad Yani Number 3, 9/10 Ulu, Seberang Ulu I District, Palembang City, South Sumatra 30111. This research involves several tools and materials, namely some software contained in a program that is run by a computer and as a device that inhibits the interaction of use and computer. While hardware or hardware is a component and physical element in compiling a computer system [4]. The following are research tools and materials:

1. Hardware consists of Laptop, Printer, Flashdisk
2. Software consists of Laravel Framework, Imagick, Xampp, MySQL, Visual Studio Code, and Microsoft Word 2007.

2.2 Research Methods

Research methods in making a system have the following stages: stages of work that must be passed. The qualitative descriptive research method is used to develop theories that are built through data obtained in the field. Qualitative Descriptive Research is to collect data based on the factors that support the object of research, then analyze these factors to look for their role[5].

2.3 Data Collection Methods

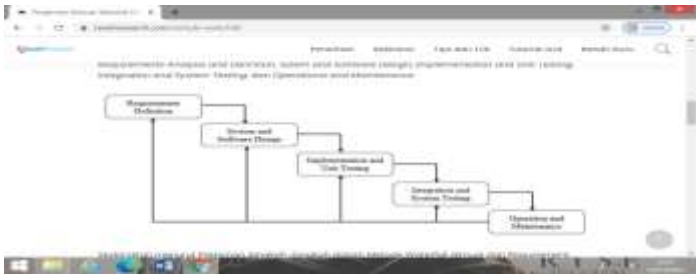
The data collection methods used in completing this research, namely:

1. Observation
   This method is carried out by observing directly the circumstances and activities of each object in order to obtain accurate information. In this case, the author is also able to directly monitor the business processes that occur at Bina Darma University.
2. Literature Study
   Collecting data by searching and studying data from books or other references related to the writing of this research proposal report.
3. Interview
   In this method the authors collect research data by asking directly to the parties concerned at Bina Darma University and verifying the data obtained.
4. Documentation
   Collect data relating to the thesis information system.

2.4 System Development Method

The system development method used in making this system is the waterfall method. The waterfall model is a classic that is systematic, sequential in building software [6]. The name of this model is actually “Linear Sequential Model". This model is often referred to as the "classic life cycle" or the waterfall method. This model belongs to the generic model of software engineering and was first introduced by Winston Royce around 1970 so that it is often considered ancient, but is the most widely used model in Software Engineering (SE). This model takes a systematic and sequential approach. It is called a waterfall because it is passed step by step and must wait for the completion of the previous stage and run sequentially. The phases in the waterfall can be seen in Figure 1.1 below:

Phases of the Waterfall Method



Source: https://ranahresearch.com/method-waterfall/

Figure 1. *Waterfall phases*

The following are the stages used in using the waterfall which consist of from:

1. Requirement Definition

This is the initial stage in the waterfall method, this stage is the same as the analysis stage, at this stage the author will analyze the problems that exist at Bina Darma University. At this stage the author will find out what needs are needed by the user to view the thesis data.

2. System and Software Design

This process is a continuation of the Requirements Definition process. This stage will produce user requirements documents or it can be said as data related to users in making software, including plans to be carried out.

3. Implementation and Unit Testing

This stage is the stage where this process will produce a document containing the user's needs or desires that are already known at the analysis stage before entering the stage of making program code or coding. This stage focuses on data structure design, software design, interface, and procedural details. This stage will produce software requirements.

a. Use Case Diagram

Use Case or Use Case Diagram is a model for the behavior (behavior) of the information system to be made [7]. Use Case describes an interaction between one or more actors and the system to be created. Below is a Use Case diagram consisting of 3 users, namely: Student Admin and Lecturer.

1. Use Case Admin

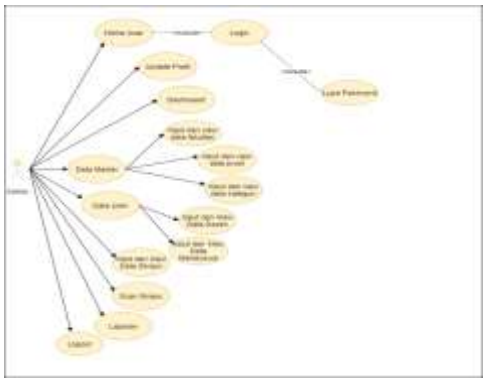


Figure 2. *Use Case Admin*

2. Use Case Student

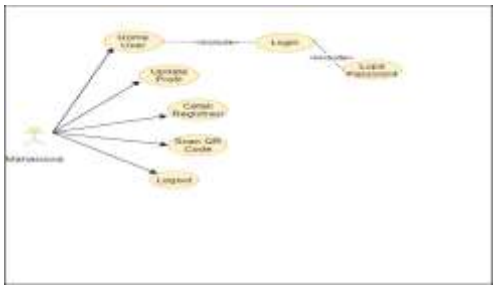


Figure 3. *Use Case Student*

3. Use Case Lecturer

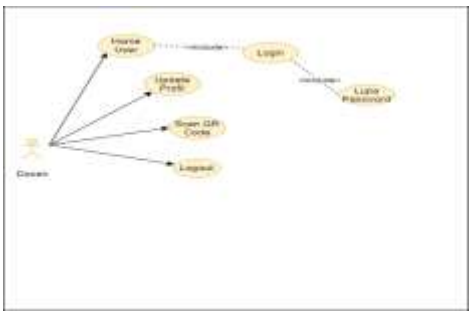


Figure 4. *Use Case Diagram*

b. Activity Diagram

Activity diagrams describe the workflow or activities of a system or business process. Activity diagrams describe system activities, not activities carried out by actors [8]. The following activity diagram is performed on the system:

1. Activity Diagram Admin

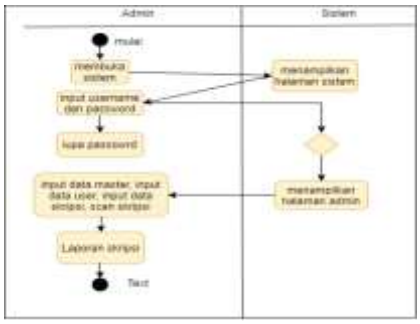


Figure 5. *Activity Diagram Admin*

2. Activity Diagram Student

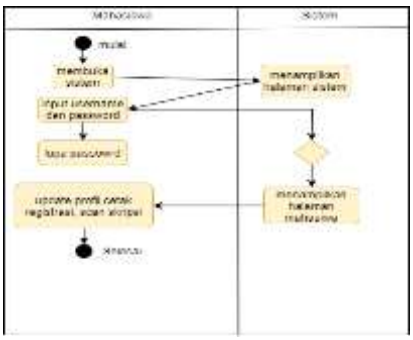


Figure 6. *Activity Diagram Student*

3. Activity Diagram Lecturer

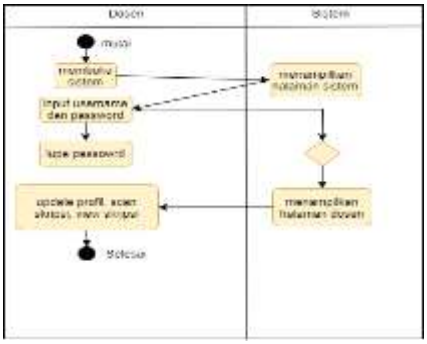


Figure 7. Activity Diagram Lecturer

c. Class Diagram

Class Diagram describes the structure of the system in terms of defining the classes that will be created to build the system [9]. Below is an overview of the class diagram on the system.

Figure 8. *Class Diagram*

4. Integration and System Testing

This stage is the process of code generation and program testing. Coding is the process of translating the design that has been made into a language that is understood by the computer so that it can become a system, in this case the author chose the PHP programming language [10]. While testing or testing aims to find out and find errors in the system which will then be repaired. At this stage the use of computers will be maximized because this stage is the actual stage in working on a system.

5. Operation and Maintenance

This stage is carried out after the code generation stage is complete, this stage is the last stage of system creation after analyzing at Bina Darma University Palembang, making designs according to user needs, and making program code according to the design, the system has been completed. created will be used by users at Bina Darma University Palembang. Then the system that has been created must be maintained regularly.

III. Results and Discussion

3.1 Results

After carrying out the stages of system development using the waterfall method which has been described in previous chapters, what is produced is a system design to a real situation about a web-based thesis information system and this qr code can help students and university lecturers develop darma to see a collection of alumni thesis data at Bina Darma University quickly by scanning the QR code in the thesis. The results of this research are poured in the form of a website that will be run through the internet network which produces a system that will make it easier for users.

3.2 Discussion

This discussion will explain about the functions of the menus and submenus that exist in the system that has been created, by displaying the interface of the functions in the system.

1. Admin

a. Page Main

This page is the main user page that is used to perform several activities such as logging in and searching for thesis title data. The following main page can be seen in Figure 9 below.

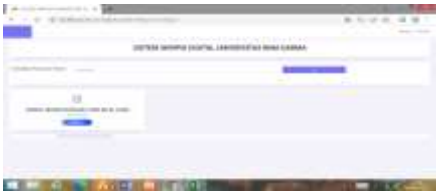


Figure 9. *Admin*

b. Page Admin Login

Page The admin login page is used to log into the system. To enter the main page, the admin must enter a username and password. The following admin login page can be seen in Figure 10 below.

Figure 10. *Admin Login*

c. Page The admin

Dashboard page The admin dashboard page is the initial view when logging into the application after logging in to the admin. The following admin dashboard page can be seen in Figure 11 below.

Figure 11. *Admin Dashboard*

d. Page Admin Profile

Page The admin profile update page is used to change or set up the admin page. The following admin profile update page can be seen in Figure 12 below.

Figure 12. *Admin Profile*

e. Page Faculty Data

Page The faculty data page is a page used by admins to perform activities such as inputting, updating and deleting faculty data on the web system. The following faculty data page can be seen in Figure 13 below.

Figure 13. *Faculty*

f. Data Page Study Program

The study program data page is a page used by admins to perform activities such as inputting, updating and deleting study program data on the web system. The following study program data page can be seen in Figure 14 below.

Figure 14. *Study Program*

g. Data Page Category

Data Pages Category data pages are pages used by admins to perform activities such as inputting, updating and deleting category data on the web system. The following category data page can be seen in Figure 15 below.

Figure 15. *Category*

h. Data Pages Student

Data Pages Student data pages are pages used by admins to perform activities such as inputting, updating and deleting student data on the web system. The following page for student data can be seen in Figure 16 below.

Figure 16. *Student*

i. Data Page Lecturer

The lecturer data page is a page used by admins to perform activities such as inputting, updating and deleting lecturer data on the web system. The following page of lecturer data can be seen in Figure 17 below.

Figure 17. *Lecturer*

j. Data Page Thesis

Data Page The thesis data page is the page used by the admin to view and print the qr code of the thesis data. The following thesis data page can be seen in Figure 18 below.

Figure 18. *Thesis Data*

k. Page Add Thesis Data Page

The Add Thesis Data page is a page used by admins to add thesis data or files into the web system. The following page for adding thesis data can be seen in Figure 19 below.

Figure 19. *Data*

l. Page

ThesisThe following script scan page can be seen in Figure 20 below.

Figure 20. *Thesis Scan*

m. page Thesis Report page

The thesis report page is the page used by the admin to view the thesis data report every year. The following page for the thesis report can be seen in Figure 21 below.

Figure 21. *Thesis Report*

2. Page Student

n. Login Page Student

A login page is a page used by students to login to the system by inputting the username and password that the admin has sent via email. The following student login page can be seen in Figure 22 below.

Figure 22. *Student Login*

o. Page Student Profile Update Page

Page student profile update page is a page used by students to change or make settings on the student page. The following page for updating student profiles can be seen in Figure 23 below.

Figure 23. *Student Profile Update*

p. Page Registration Print Page Print registration

Page is a page used by students to print registration forms on the web system. The following printed registration page can be seen in Figure 24 below.

Figure 24. *Print Page Registration*

q. Thesis Scan

Page The thesis scan page is used to search theses by scanning the qr code on the web system. The following page of the script scan can be seen in Figure 25 below.

Figure 25. *Thesis Scan*

3. Page Lecturer

r. Login Page Lecturer

Login page The lecturer login page is the page used by the lecturer to login by inputting the username and password that the admin has sent via email. The following lecturer login page can be seen in Figure 26 below.

Figure 26. *Lecturer Login*

s. Page Lecturer Profile Update Page The lecturer

Profile update page is a page used by lecturers to change or make settings on the lecturer page. The following page for updating the lecturer profile can be seen in the following figure 27.

Figure 27. *Lecturer Profile Update*

t. Page Thesis Scan

Page The thesis scan page is a page used by lecturers to search for theses by scanning the qr code on the web system. The following page scans the thesis can be seen in Figure 28 below.

Figure 28. *Thesis Scan page*

IV. Conclusion

Based on the research conducted by the author at Bina Darma University, the following conclusions are obtained:

1. This research produces a web-based thesis information system and qr code that is useful for conducting online thesis searches at Bina Darma University.
2. This information system has 3 users, namely admin, students and lecturers.
3. This system is equipped with a QR-Code feature to make it easier to find a thesis.

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