



Design and Build a Web-Based People's Library Application in Jambi City

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Abstract—People's library is one of the libraries engaged in literacy and education that provides stalls for free. Free reading is prepared by the People's Library at certain locations, where the general public who are close to the lapak location can read their collection of books for free. The lack of literature and the desire to read the community requires special attention by collaborating with information technology which is used as a medium to publish writings and books by the people's library management and makes it easier for readers who are constrained by distance and time. The media is in the form of a Web-Based People's Library application in Jambi City which was built using the development method with the waterfall method. Programming using PHP programming language with laravel framework and MySQL database. This application can be used by the people's library manager to manage book data or visitors and the general public as a literacy medium to read books and view the collections owned by the people's library.

Keywords: Applications; Information Technology; Waterfall; Databases; MySQL

1. INTRODUCTION

The library is an institution that provides various information about various things, both for young people and adults. Libraries have an important role in advancing Indonesian literacy culture because they provide many books to choose from based on the wishes of the readers.

People's library is one of the libraries located in the Kembar Lestari I Housing, Kenali Besar Village, Kota Baru District, Jambi City. People's Library is an organization that has the same function as a library where they are engaged in literacy and education. The People's Library has many activities, such as Free Reading. Free reading provided by the People's Library at certain locations, where the general public who are close to the lapak location can read their collection of books for free.

According to the head of the People's library, there is still very little literation and public interest in reading, especially among young people and requires special attention. This literacy culture can be collaborated with information technology in the form of applications that make it easier for all circles of society, both young people and parents to read or find out useful information from the collection of books owned by the People's Library. In addition, this application media can help the managers of the people's library in collecting data on the collection of books they have, an information center for the activities carried out as well as a promotional media for the people's library organization and as a media center for donations obtained from donors related to book donations so that each activity can running smoothly. With the current condition of the world during the COVID-19 outbreak, this application can act as a medium that can reduce direct contact between readers and administrators of the people's library so as to reduce the spread of the virus.

With this Web-Based People's Library Application, it can help increase organizational productivity and provide faster information, improve literacy and knowledge of young and old people.

The research carried out refers to several studies, namely the first research entitled "Web-Based E-Library System at Padang State Polytechnic". The purpose of this research is to create a website that can provide information about books by simply entering the title of the book in the search form. In this study there are differences in access rights for each user. The similarity of previous research with research conducted at this time is to produce a system that can provide information about books that exist in the database of the website itself [1]. The second research is entitled "Design of a Library System for Electronic Journals". The purpose of this research is to develop a digital library to provide resources and manage digital data. Digital libraries whose collections can be read and are economically available for use by certain communities or groups of communities [2].

The third research is entitled "Design of Web Service Library of Sam Ratulangi University". The purpose of this research is to develop services in the form of book catalog data, book borrowing, and library membership. All book catalog databases will be centralized using a service that will be created [3]. The fourth study entitled "Design of Information Systems for Borrowing and Returning Library Books at SMP Negeri 1 Madiun". The purpose of this study is to provide services for borrowing and returning books and making it easier for officers to manage library data administration [4].

Design is a series of procedures for translating the results of the analysis of a system into a programming language to describe in detail how the system components are implemented [5]. Design is the stage after the analysis of the system development cycle which is the definition of functional requirements, and describes how a system is formed which can be in the form of drawing, designing and making sketches or arrangements of several separate elements into a unified whole and functioning, including concerning the configuration of the hardware and software components of a system [6]. Object-oriented design is the stage of designing the classes identified during the analysis and user interface stages and allows for the addition of several objects and classes that support the implementation of the requirements specification [7].

Digital Library is an organization that provides information services for book collections in digital form for use by certain communities [8]. Unified Modeling Language (UML) is a modeling language that has become a standard in the software industry for visualizing, designing, and documenting software systems. The resulting design is in the form of UML diagrams which will be translated into program code at the implementation stage and there are 13 types of official diagrams used in UML-based object-oriented design. In this thesis research the author uses 4 types of diagrams, namely use case diagrams, activity diagrams, sequence diagrams and class diagrams [9].

The waterfall model is a method used to develop software, often called a linear sequential model, which provides a sequential or sequential software life flow approach starting from analysis, design, coding, testing, and support stages [10]. The stages in this method are Requirements analysis and definition, System and software design, Implementation and unit testing, Integration and system testing, Operation and maintenance [11].

Website-based application development is an internet facility that connects local and remote documents that can be accessed via browsers such as Netscape Navigator, Internet Explorer, Mozilla Firefox, Google Chrome, and other browser applications [12]. After the application is complete, testing is carried out using the Black-Box Testing method. Black box testing is testing software in terms of functional specifications without testing the design and program code. Testing is intended to determine whether the functions, inputs, and outputs of the software are in accordance with the required specifications [13].

2. RESEARCH METHODOLOGY

2.1 Research Flow

The research flow of an Design and Build a Web-Based People's Library Application in Jambi City is shown in Figure 1 below.

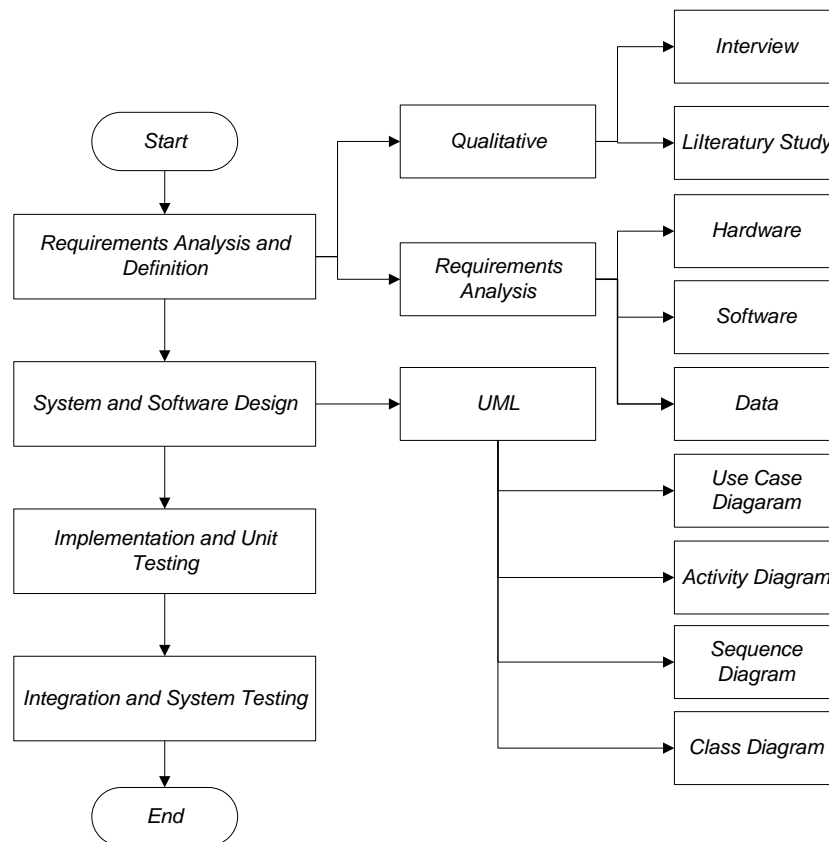


Figure 1. Research Flow of Design and Build a Web-Based People's Library Application in Jambi City

The software development method applied by the author in building a Web-based application for the People's library is the waterfall method. In this study, the author only adopted 4 of the 5 stages in the method, namely: Requirements analysis and definition, System and software design, Implementation and unit testing, and Integration and system testing. The following is an explanation of the stages in software development:

a. *Requirements Analysis and Definition*

The initial stage carried out by the author is to analyze the problems experienced by the people's library by analyzing the system that is running at the People's library. The steps are carried out using 2 methods, namely interviews and literature study.

b. *System and Software Design*

The second stage is the stage where the author designs the design for the application to be made, including:

1. UML design.
 - a. Design use case diagram as a description of the application to be built.
 - b. Design activity diagrams to describe the activities of each use case diagram.
 - c. Design sequence diagram to describe the flow of user interaction in the application.
 - d. Design class diagrams to show the relationship between classes.
 2. Design user interface.
- c. *Implementation and Unit Testing*
 Implementation is the stage of changing the design that has in the previous stage to be converted into the form of program code that can be used by users.
- d. *Integration and System Testing*
 At this stage, testing is carried out on the results of program coding based on the previous stage. The testing of existing functions in this study will use the black box testing method.

3. RESULT AND DISCUSSION

2.2 Design and Modelling

2.2.1 Modelling

a. *Use Case Diagram*

The following is a use case diagram of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 2:

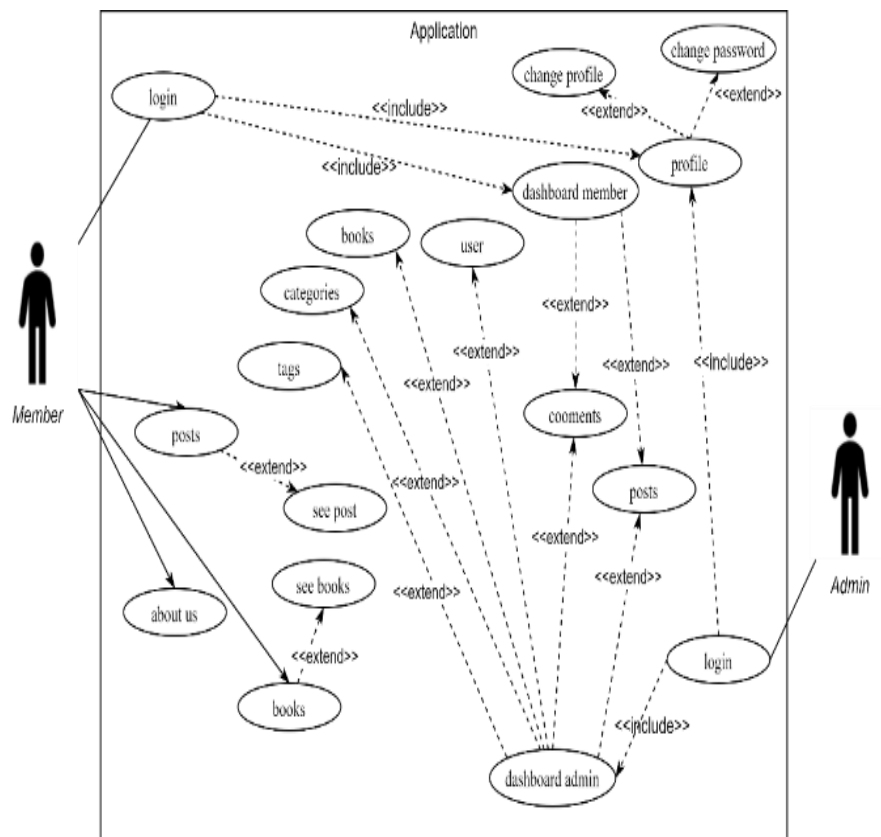


Figure 2. Use Case Diagram Design and Build a Web-Based People's Library Application in Jambi City

Figure 2 shows the functions that can be performed on the application and which actors have access to it. The actors involved in this application are members (visitors) and admins (managers). Member actors can view information in the form of book collections, ongoing and ongoing activities and profiles of visitors themselves. While the admin actor performs management related to all activities in the application.

b. *Activity Diagram*

The following is a picture of the activity diagram of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 3:

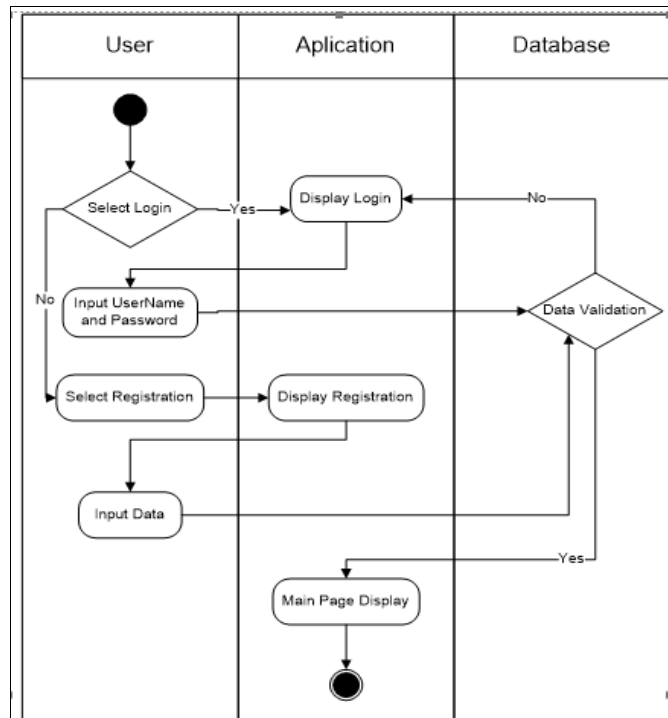


Figure 3. Activity Diagram Design and Build a Web-Based People's Library Application in Jambi City

Figure 3 shows the work flow in the application process. It can be seen that when the user wants to login, the user first selects the login menu, then enters the email and password in the form provided and presses the login button. If the email and password entered are correct, the application will display the main page.

c. *Sequence Diagram*

The following image sequence diagram of the Web-Based People's Library Application Design in Jambi City can be seen in Figure 4:

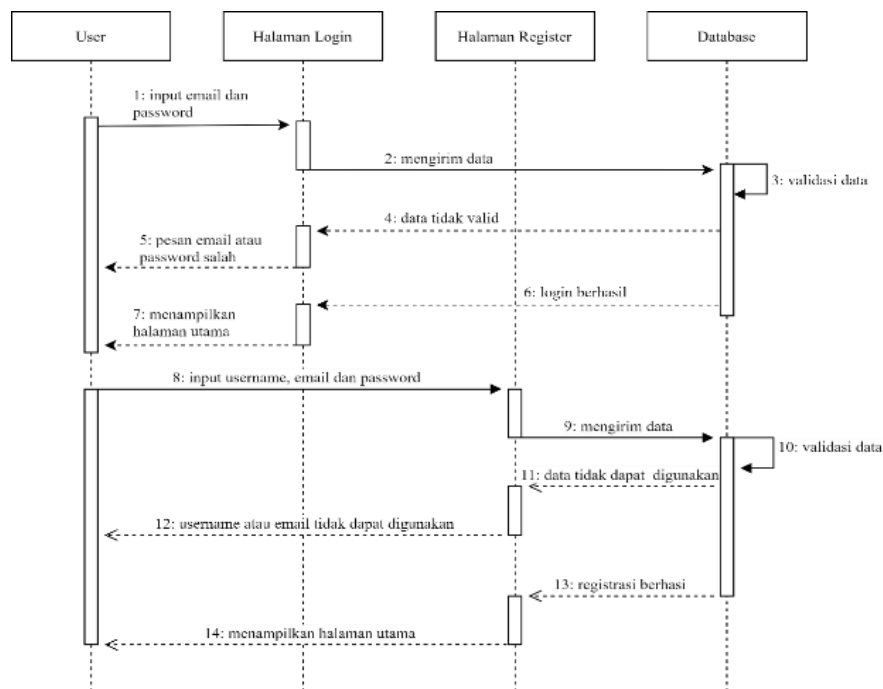


Figure 4. Sequence Diagram Design and Build a Web-Based People's Library Application in Jambi City

Figure 4 describes the interaction between objects in the process to the application. The figure illustrates the actor's interaction with the application through the login verification process before further accessing the application.

d. *Class Diagram*

The following is a class diagram of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 5:

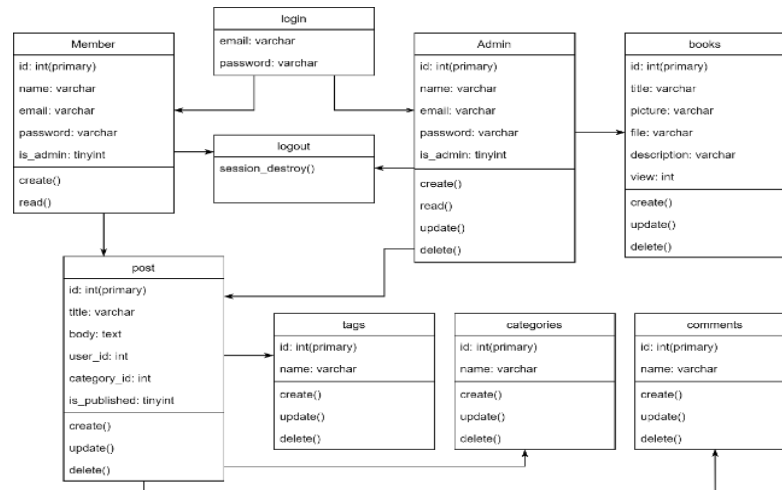


Figure 5. Class Diagram Design and Build a Web-Based People's Library Application in Jambi City

Figure 5 shows the interaction between each class which is indicated by a line connecting the classes. The class describes the relationship of data to one another in the application.

2.2.2 Display Design

a. Main Page Design

The following is an image of the main page design of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 6:

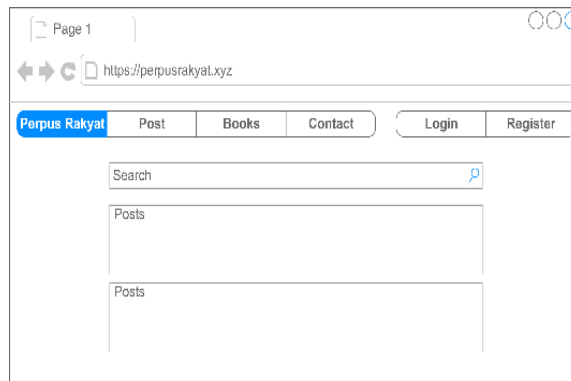


Figure 6. Main Page Design

From the picture above is the main page of the Web-Based People's Library Application. There is an input type search section to search for posts.

b. Books Page Design

The following is a picture of the book page design from the Design and Build of a Web-Based People's Library Application in Jambi City, which can be seen in Figure7:

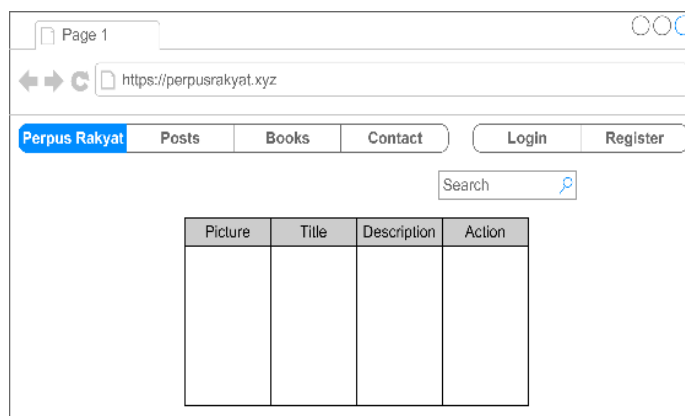


Figure 7. Books Page Design

From the design image above, it can be seen on the books page where there will be a table containing images, titles, descriptions and actions on the saved books.

c. *About Us Page Design*

The following is an image of the about page design of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 8:

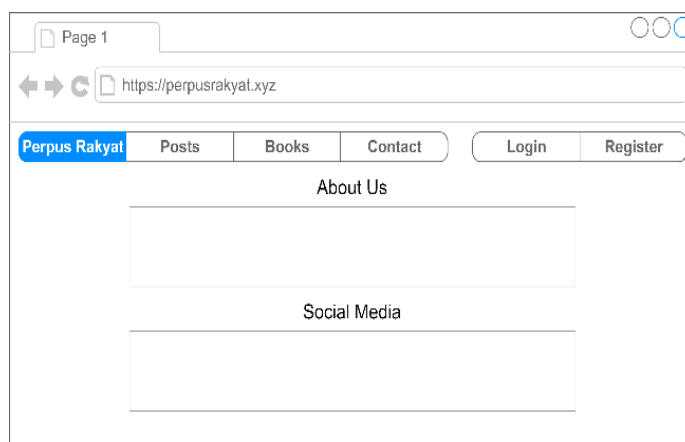


Figure 8. *About Us* Page Design

In the design of the user interface above, it is made by making a box that accommodates contacts and social media from the people's library.

3.1 Program Implementation

a. *Main Page*

The following is a picture of the main page display of the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 9:

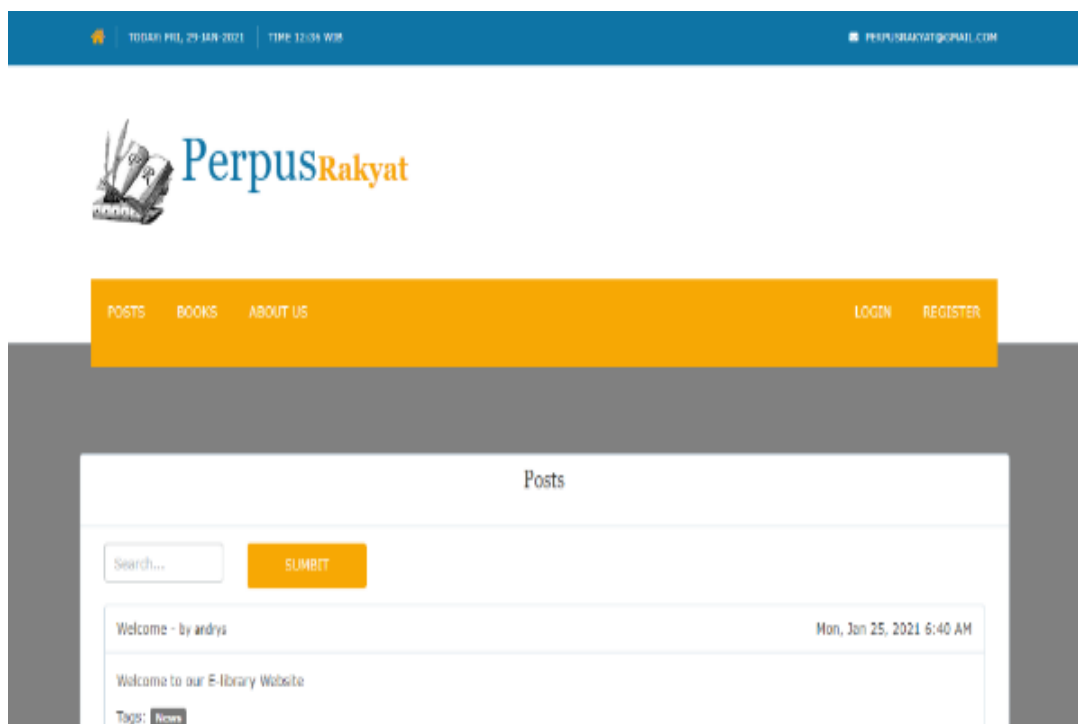


Figure 9. Main Page

Figure 9 is the result of the implementation of the main page user interface design. This page displays posts from admins in the form of news or information.

b. *Book Page*

The following is a picture of the book page display from the Design and Build of a Web-Based People's Library Application in Jambi City, which can be seen in Fig 10:

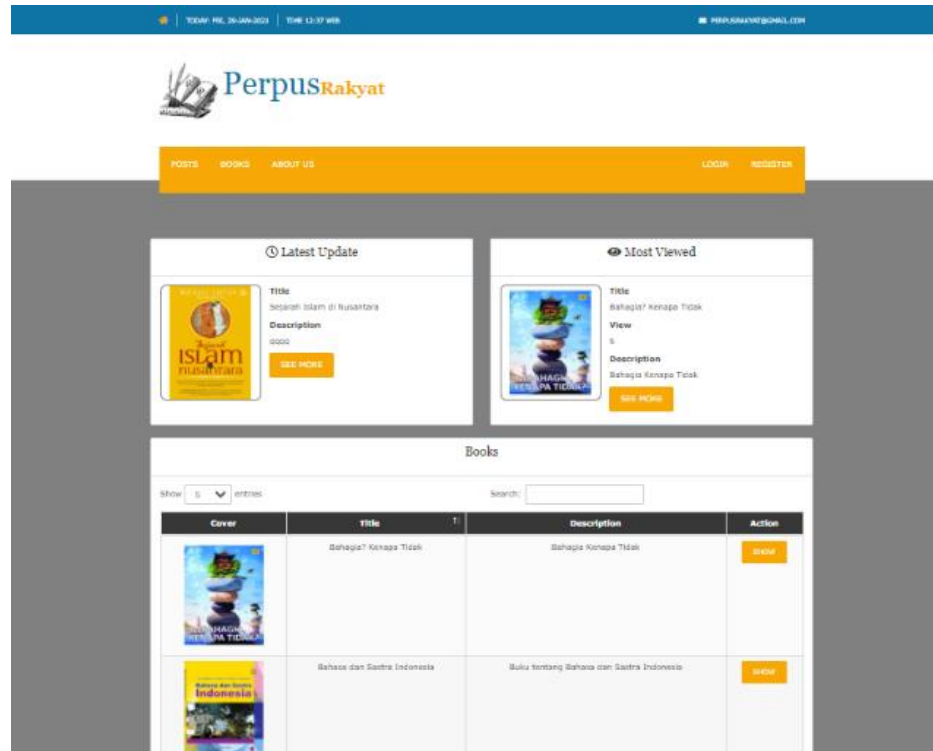


Figure 10. Book Page

Figure 10 is an implementation of the user interface design for the books page. On this page there are books that have been updated by the admin.

c. About Us Page

The following is an image of the page display about Us from the Web-Based People's Library Application Design in Jambi City, which can be seen in Figure 11:

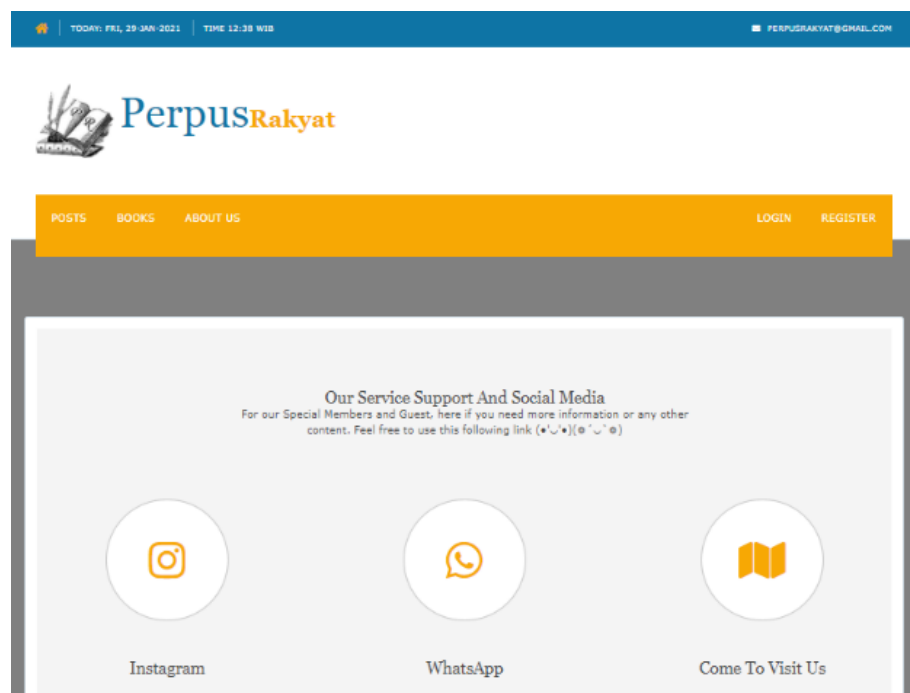


Figure 11. About Us Page

Figure 11 is the result of implementing an about us page that displays information for contacting admins or accessing existing social media.

3.2 Program Testing

In the testing conducted using a questionnaire involving 20 respondents who came from managers and visitors from the people's library. The testing method used in this research is black box. The following are the results of black box testing on a web-based public library application which can be seen in the tables below:

a. Login and Registration Test

Table 1. Login and Registration Test

No	Scenario Testing	Results	Conclusion
1	Login by entering correct email and password.	Display valid main page	<i>valid</i>
2	Login by entering wrong email and password	Login denied	<i>valid</i>
3	Register by entering a new email	Successful registration	<i>valid</i>
4	Register by inputting the registered email.	Display the registered email message	<i>valid</i>

b. Test Adding Books by Admin

Table 2. Test Adding Books by Admin

No	Scenario Testing	Results	Conclusion
1	Admin Input new book	New book added successfully	<i>valid</i>
2	Admin delete books	Book deleted successfully	<i>valid</i>

c. Test of Creating a New Post by Admin

Table 3. Test of Creating a New Post by Admin

No	Scenario Testing	Results	Conclusion
1	Admin created a new post	New port added successfully	<i>valid</i>
2	Admin delete post	The selected post has been deleted successfully	<i>valid</i>

4. CONCLUSION

Web-Based People's Library Application in Jambi City which was built using the development method with the waterfall method. Programming using the PHP programming language with laravel framework and MySQL database. This application can be used by the people's library manager to manage data book or visitors and the general public as a literacy medium to read books and view the collections owned by the people's library. This application has been built and tested functionally with the black-box method involving 20 respondents. The respondents were 8 people from the librarian, library management and 12 people were visitors from the people's library. The results of this test. respondents answered 5 questions related to the function and appearance of the application with a value of 81% very well according to needs and 19% of respondents answered less satisfied. From these assessments it can be concluded that this application has been considered feasible, has a good appearance and can be used according to needs.

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