Web-Based Library Information System at SDN 2 Cerme Kidul

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Abstract – The library transaction process at SDN 2 Cerme Kidul is carried out by utilizing data from this web-based application. Library operations, including membership procedures, borrowing, and returning books, are managed through this application. This website is designed to handle these processes while supporting master data management, assisting library book collection management, facilitating book searches through catalogues, and presenting reports related to book collections. The creation of this website uses the waterfall system development method, which involves data collection through interviews, observations, and literature studies. Analysis is carried out on aspects of users, technology, needs, data, systems, information, performance, and system design using flowcharting diagrams. Website development utilizes the PHP programming language, MySQL database, Apache local server, and Sublime Text editor. For testing, black box testing and beta testing methods are used. This library application provides many benefits, such as helping librarians improve work efficiency, speeding up the process of borrowing and returning books, calculating fines faster, and making it easier for library users to access information related to the library.

Keywords–Web Application, Library, SDN 2 Cerme Kidul.

I. INTRODUCTION

The rapid development of science and technology requires adequate data management skills to create balance. This aims to ensure that the process of collecting, processing, storing, and distributing data can be carried out quickly and continuously in accordance with user expectations. Traditional libraries that only provide book collections without the support of computerized search and catalogue systems need to be abandoned in the context of modernizing book lending services [1].

Various types of libraries, including school libraries, can utilize web-based resources to improve data management efficiency. With a website-based information system, library management becomes more structured, time is saved, and documentation of book borrowing circulation is better organized [2].

As a center of knowledge sources, libraries have an important role in improving children's mindset through reading habits. The books available in the library can be utilized as much as possible to develop their insights. The library is also a strategic place to find important information that supports the development of science.

However, manual library management with a large book collection faces many challenges. In SDN 2 Cerme Kidul, for example the manual system is considered inefficient because it is only managed by one officer, so that documentation of activities and grouping of book collections by category on the shelves is less than optimal.

To overcome these problems, it is recommended that SDN 2 Cerme Kidul adopt a web-based application information system. The implementation of a web-based system not only helps improve the efficiency of librarians' work but also improves the image of the school. With this application, library management can be more integrated and beneficial for all stakeholders at SDN 2 Cerme Kidul.

II. LITERATURE REVIEW

A. SYSTEM DEFINITION

The system can be designed using the waterfall software development method, which allows the creation process to be

carried out in a structured and systematic manner according to the stages in the development cycle. This method is called waterfall because the process takes place in stages and sequentially, from one step to the next [3].

B. UNDERSTANDING INFORMATION SYSTEMS

The output system combines input, processing, storage, and output distribution components into a set of interconnected elements that function together as a whole [4]. This system is a structured approach designed to collect, input, process, store, manage, organize, and convey information to support the achievement of organizational goals [5].

C. DEFINITION OF LIBRARY

This web application is designed and developed to simplify the process of borrowing and reading books through a digital library. Features in this application include user registration, multiuser login, and book data management [6].

D. WEBSITE

A website or network is a collection of web pages that provide various types of information such as text, images, music, video, and animation. These pages are connected via the internet. The web operates using the HTTP (Hypertext Transfer Protocol) protocol, which works in conjunction with other protocols through software known as a browser [7].

E. MYSQL

MySQL (My Structured Query Language) is a program or system used to manage database output or information management. MySQL functions to store all data generated by the computer and manage output at a basic level. This system is known to be reliable and efficient, with a fast and simple query process, making it very suitable for use in web-based applications [8].

III. RESEARCH METHODS

The research methods applied in this study are as follows:

A. *Data Collection Method*

Researchers use this approach to collect relevant and accurate data. The following are the methods used in data collection:

1. Interview

This method is used to obtain information directly from the source. The researcher conducted an interview with the librarian at SDN 2 CERME KIDUL as part of this study.

2. Observation

Observation was conducted by directly observing the activities taking place at the research location. The researcher conducted direct observation at SDN 2 CERME KIDUL by visiting and witnessing the activities taking place.

3. Documentation

The documentation method is used to collect data in the form of information and images related to research from the location being studied.

4. Literature review

As supporting and complementary data, researchers also conduct literature studies by referring to books or articles that are relevant to the research topic.

B. *System Development Methods*

This study applies a system development approach with the waterfall method. The stages in the waterfall development model are explained as follows [9]:

1. System Requirements Analysis
   This phase involves analysing the system requirements. Interviews can be conducted to gather the necessary information. The data obtained will help in designing the system.
2. Design Stage
   This design phase focuses on creating a system design, with the aim of producing a picture of an efficient and effective system in the future
3. Implementation Stage
   In this implementation phase, the system is deployed in a coding environment and tested to ensure that it meets the specified requirements.

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4. Maintenance
   The system design process ends with this phase. By performing system maintenance and checking to see if the information system is functioning properly and in accordance with the officer's expectations.

IV. IMPLEMENTATION AND DISCUSSION

This stage includes system design and implementation of the results of the information system design process.

A. Library Member Registration Flowchart

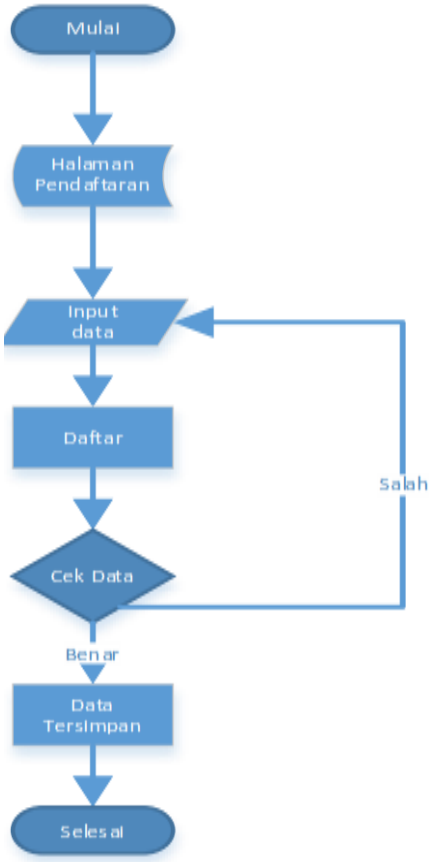

Figure 1. Member Registration Flowchart

Figure 1 shows the flowchart for new member registration. Visitors register as members through the library staff, who then fill in the student data completely and save it [10].

B. Book Borrowing Flowchart

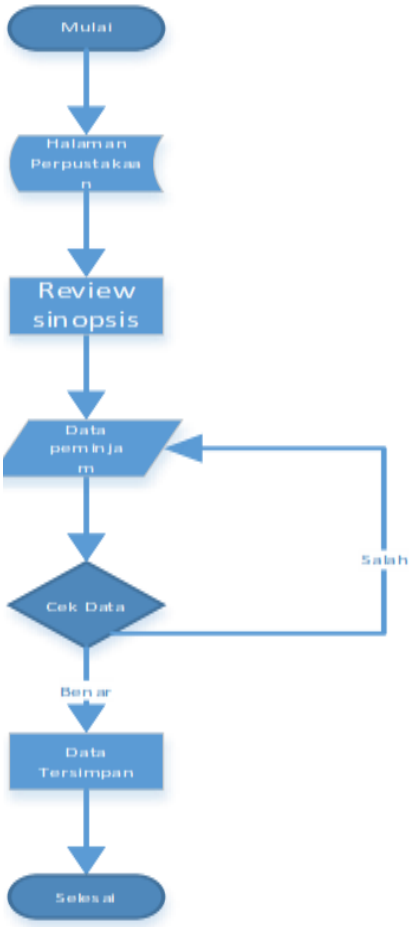

Figure 2. Book Borrowing Flowchart

Figure 2 illustrates the flow where library members view book synopsis on the library website page. If a member wants to borrow a book, the librarian will input the borrower's data. If the member's data is valid and registered, the member can proceed to borrow.

C. Login Page View

Figure 3. Login Page View

Figure 3 shows the login screen for admin and additional officers. Users must enter their

username and password to complete the login process on the home page or main screen of the system.

D. Dashboard Page View

Figure 4. Initial Page View

When you first log in as an administrator, you will see the administrator view as shown in Figure 4. This view displays the admin information accessed using the username and password owned. On this screen there is a profile photo, member list, book type, and others.

E. User Data List View

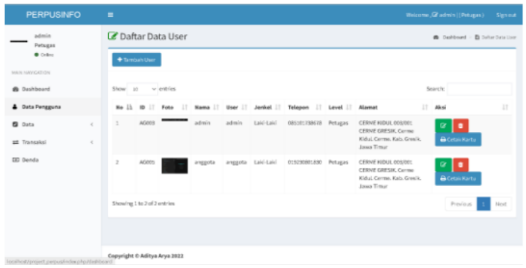

Figure 5. Salary Output Display

Figure 5 above shows the User Data List information page. On this page, the administrator can add new users to the system.

F. Book Data View

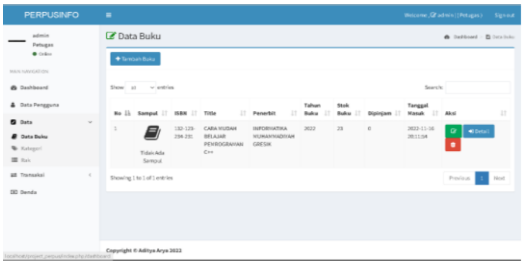

Figure 6. Book Data

Figure 6 is a display of Book Data information. On this page, the administrator can add various types of new books to the system.

G. Category Data Results

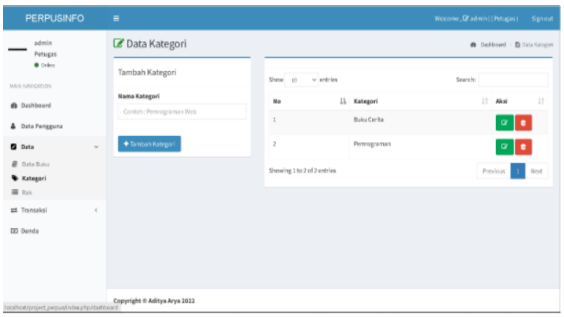

Figure 7. Category Data Display

Figure 7 is a display of Book Category information. This page displays data on book categories in the library.

H. Bookshelf Data

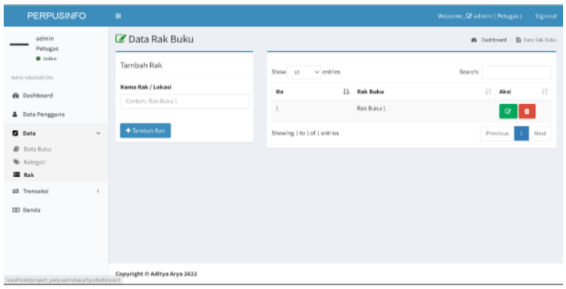

Figure 8. Bookshelf Data

Figure 8 shows the Bookshelf information display. This page displays data about the shelves in the library, and users can also add new bookshelves.

I. Book Borrowing Data

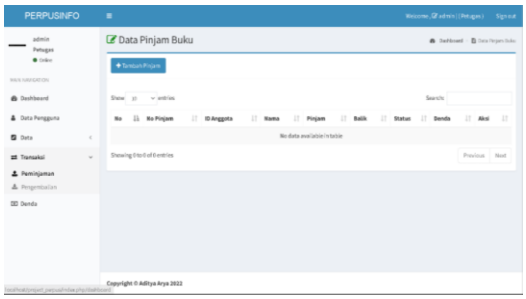

Figure 9. Book Borrowing Data

Figure 9 is a display of Book Borrowing Data information. This page displays data on books borrowed by library members.

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J. Book Return Data

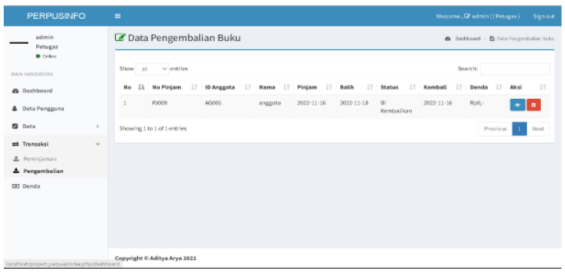

Figure 10. Book Return Data

Figure 10 above is a display of Book Return Data information. This page displays data on books returned by library members.

K. Test Results

TABEL 1
TEST RESULT

Test Description	Expected results	Test Results	Conclusion
"Enter the Member ID, loan date (1-30), and book code, then click submit."	The system successfully added to the database and updated the page display	The system shows a "Data Saved Successfully" popup and resets the form columns.	In accordance
"Failing to enter the Member ID, borrowing date (1-30)	The system refuses to save data	The system displays a warning message "Please complete the fields in the form"	In accordance

The test results are shown in the table above on the book borrowing page.

V. CONCLUSION

The following are the conclusions that can be drawn from the explanation and discussion of this research:

1. It is clear that the features of the web-based library software tested on the borrowing page have been functioning well.
2. The existence of a web-based library system makes it easier for students and library staff to borrow, return and make reports.

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