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DESIGN OF A WEB-BASED LIBRARY INFORMATION SYSTEM AT STATE VOCATIONAL HIGH SCHOOL 3 OF SOLOK SELATAN

Dikky Rahmadana Putra[1], Anggri Yulio Pernanda[2], Mourend Devegi[3]
Faculty of Science and Technology, PGRI University of West Sumatra
e-mail: dikirahmadana27@gmail.com, anggriyulio@gmail.com, mourend@gmail.com,

Abstract

The unavailability of the library information system has posed a challenge for librarians in managing a library's inventory, which is susceptible to loss or damage. The objective of this research is to create a system that can assist librarians in managing the library at SMK Negeri 3 Solok Selatan. The research methodology used in designing this system utilizes the System Development Life Cycle (SDLC) with a Waterfall model. It consists of five stages: planning, analysis, design, implementation, and maintenance. Field research processes were conducted through observation and interviews. The test results from the evaluation table of the developed library information system are excellent, with an average evaluation percentage of 91.47%. The criteria include functionality with a percentage of 94.44%, constraints with a rating of 91.67%, system usability with an evaluation of 91.86%, as well as efficiency (95.83%), maintenance (91.67%), and portability (91.47%). This information system may still require updates to its interface and existing information systems since, with the passage of time, new features may emerge to facilitate user access to the information system.

Keywords: Web-Based Library Information System

Abstrak

Ketidaktersediaan sistem informasi perpustakaan telah menjadi kendala bagi pustakawan dalam menjaga inventaris perpustakaan yang rawan hilang atau rusak. Tujuan dari penelitian ini adalah untuk menciptakan sebuah sistem yang dapat membantu pustakawan dalam mengelola perpustakaan di SMK Negeri 3 Solok Selatan. Metode penelitian yang digunakan dalam perancangan sistem ini menggunakan metode System Development Life Cycle *(SDLC) dengan model* Waterfall *(air terjun). Terdiri dari 5 tahapan yaitu: perencanaan (*planning*), analisis (*analysis*), desain (*design*), implementasi (*implementation*), pemeliharaan (*maintenance*). Proses penelitian lapangan ini dilakukan dengan cara observasi dan wawancara. Hasil pengujian dari tabel persentase penilaian sistem informasi perpustakaan yang dikembangkan sangat baik dengan rata-rata persentase penilaian 91,47% dengan kriteria fungsionalitas dengan persentase 94,44%, pada kriteria kendala dengan persentase penilaian 91,67%, pada kriteria kegunaan sistem persentase penilaian 91,86%, serta kriteria efisien 95,83%, pemeliharaan 91,67%, dan portabilitas dengan persentase 91,47%. Sistem informasi ini masih perlu dilakukan pembaruan pada sistem interface dan sistem informasi*

yang ada, karena seiring dengan perkembangan waktu maka akan muncul fitur-fitur yang dapat mempermudah pengguna dalam mengakses sistem informasi.

Kata Kunci: Sistem Informasi Perpustakaan Berbasis Web

1. INTRODUCTION

In the current era of globalization, information technology plays a very important role, especially in education. Information technology is very helpful for teachers, students, and parents in obtaining information easily and clearly. The use of information technology is often applied in educational institutions such as schools, and it is quite effective in helping the learning process, especially in the library section, to monitor books and other activities. Therefore, a web-based library information system can be an option for schools to simplify and shorten the time for data collection and other activities.

According to Rahmawari & Bachtiar (2018) in the Journal of Library and Information Science, "Library information systems are a set of rules or elements that exist in an organization and are used to meet the needs within the library." The system is used to monitor books and other activities in the library, and a web-based library information system can be an option for schools to simplify and shorten the time for data collection and other activities (Raharto et al., 2021).

Based on the observation conducted on March 1, 2023 at SMK Negeri 3 Solok Selatan, the library management system is still manual, starting from the inventory of books, borrowing, and returning books. The library inventory still uses a notebook as a storage for book data, so the data in the notebook is vulnerable to damage or loss. Students who borrow books from the library often do not write their names in the borrowing book, causing the book to not be returned or even lost in the hands of the student. Some students also fill in the borrowing book carelessly, for example, filling in the borrowing and return dates at the same time and signing to indicate that they have returned the book, even though in reality the book has not been returned yet.

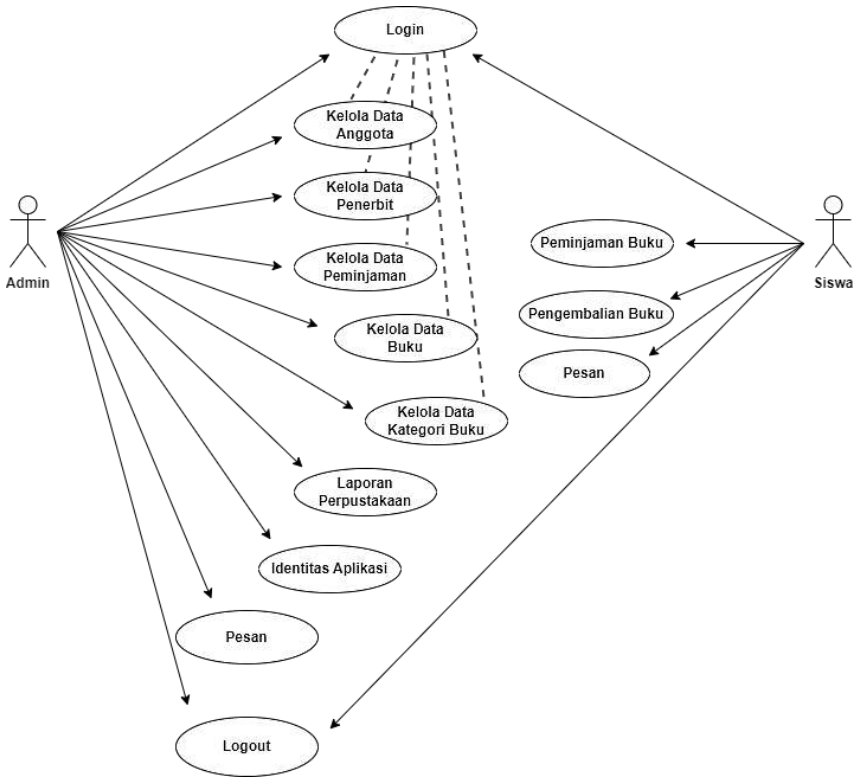
This incident caused teachers to be confused about how to deal with it because it often happens that books in the library are lost and it is not known who borrowed them and when they will be returned. From the problems above, a library information processing system is needed which is used to control everything related to the library, whether it is searching for information about the books needed, borrowing or returning books. Therefore, in this research a web-based library information system will be created that suits the needs of SMK Negeri 3 Solok Selatan.

Based on the description above, an idea was born to design a web-based system as a means of support for teachers and students in searching for information related to libraries with the title "Designing a Web-Based Library Information System at SMK Negeri 3 Solok Selatan".

2. METHOD

Research on designing a web-based library information system at SMK Negeri 3 Solok Selatan was carried out using the System Development Life Cycle (SDLC) method with the Waterfall model. In designing a web-based library information system at SMK Negeri 3 South Solok, it is designed to make it easier for teachers and students in the process of borrowing and borrowing library books. Data collection methods are the methods used to collect data to be researched. The data collection method used in this research is field research. Field research (field studies) is research carried out by collecting data and information directly from respondents. The field research process was carried out by means of observation and interviews.

The information system analysis proposed at this stage is to carry out a design to build a new ystem so that the needs of the system are met. With the new system, it is hoped that it will make it easier for teachers and students to borrow and borrow books at the library just by using the internet network. System design focuses on structure design, system design, and interface design. This stage changes system requirements from the system requirements analysis stage to a design description so that it can be implemented into a program at the next stage.

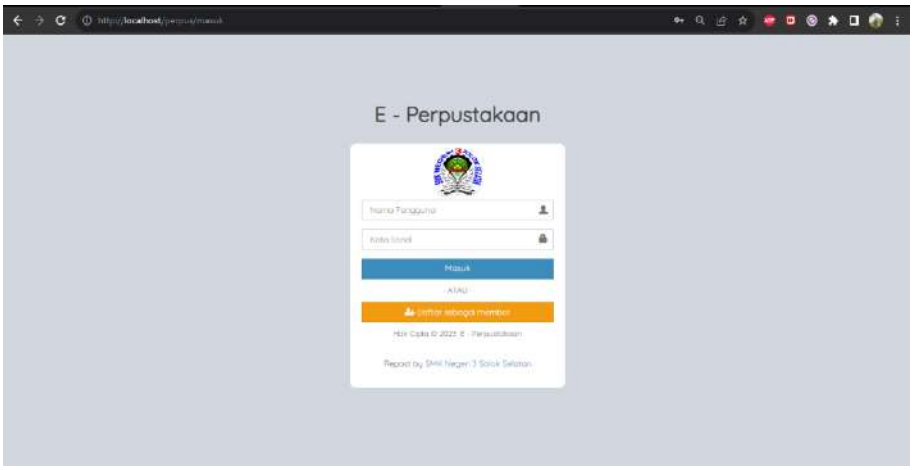


Picture 1. Use Case Diagram

3. FINDINGS AND DISCUSSION

After going through the analysis and design stages in the previous chapter, the next stage is system implementation. System implementation is the process of implementing the design of the program that was designed in the previous chapter, using events.

The following are the implementation stages of designing a web-based library information system at SMK Negeri 3 Solok Selatan:



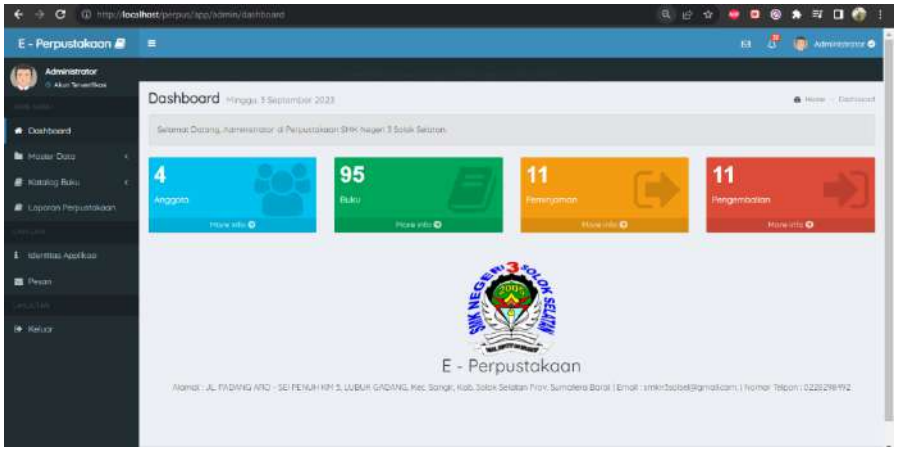
Picture 2. login page

In Picture 2. the system's initial page (home) has a login menu, library visitors who are not yet registered can register as members of the library provided. On the login page, users are required to enter the correct username and password in order to enter the library information system. If the password entered is incorrect, the user cannot enter the library system.

Picture 3. Book Search and Statistics

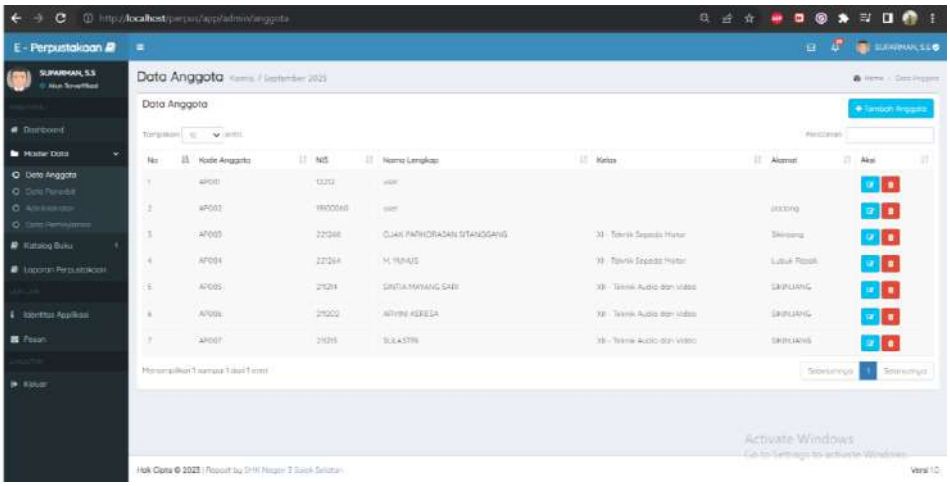
In Picture 3. the search page and book statistics are still on the login page, the search menu functions as a place to search for the availability of book titles to be borrowed, so that

before borrowing a book students can see whether the book is available or not. In book statistics, students or visitors can find out what books are currently popular to borrow.



Picture 4. Admin Dashboard

In Picture 4. is the admin dashboard which contains the number of members who have registered and data from library members. Apart from that, there is also a book page which contains data regarding books in the library. On the dashboard page there are also names of students who have borrowed and returned books that have been purchased. borrowed.

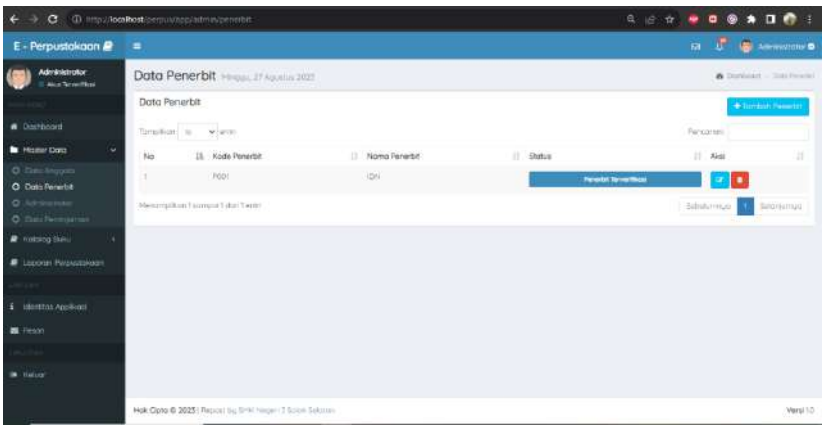


Picture 5. Member Data Page

In Picture 5. the member data page contains data from library members who have registered.

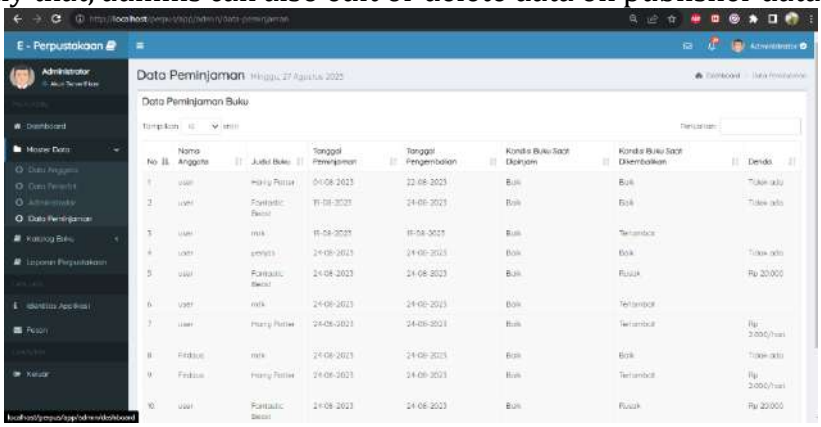
The admin can edit and delete data from members if an error occurs in filling in the data. The data that appears is member code, nis, full name, class and member address. The admin can also add new library members, the admin enters the student's identification number, full

name of the student, username, password, class and student address, then save, then the added data will appear automatically on the member data page.



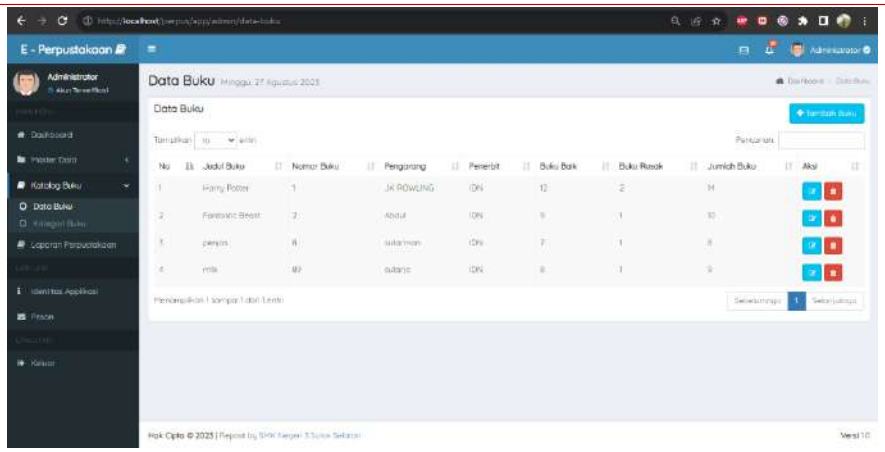
Picture 6. Publisher Data

In Picture 6. the publisher data page contains the publisher code, publisher name, status, and action. When adding publisher data, the publisher code has been set automatically by the admin, only the name of the publisher of the book and the status of the book that we need to enter, and whether the publisher of the book has been verified or not verified. Not only that, admins can also edit or delete data on publisher data.



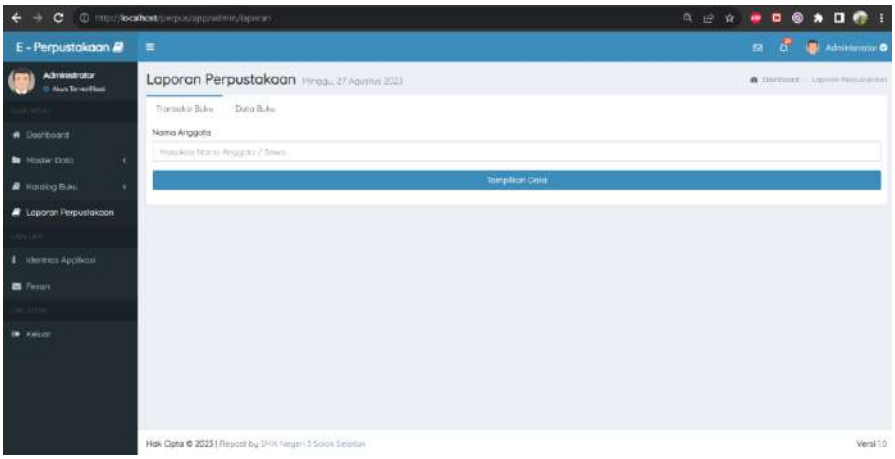
Picture 7. Book Borrowing Data

In Picture 7. the book borrowing data page contains data from library members who have borrowed books, borrowing data consists of the member's name, title of the book borrowed, date of borrowing, date of return, condition of the book when borrowed, condition of the book when returned, and fines if the book is returned in good condition. damaged, accidentally lost by the student, or the student is late returning the books that have been borrowed.



Picture 8. Book Data

In Picture 8. on this page, librarians can add book data to the database, starting from entering the book title, book number, book publisher, author name, number of books that can be borrowed, and the number of damaged books and the total of all books.



Picture 9. Library Report

In Picture 9. on the library report page, admins can print reports starting from the date the book was borrowed, the date the book was returned, and the name of the library member. On this page the librarian enters the name of the student who borrowed the book and then displays the data, apart from that there is also a book data menu available.

Testing the library information system uses the black box method. The following is an explanation of the test method that will be carried out:

1. Black box testing

Table 1. Blackbox Tes

No	Test Class	Testing Details	Test Type
1	Login Menu Testing	Confirm the login data by entering the login username and password	Blackbox Testing
2	Librarian Main Menu Testing	The system displays a dashboard page and several menus for managing members, managing books, managing loans and managing returns	Blackbox Testing
3	Member Data Menu Testing	Testing add member, search, edit and delete buttons	Blackbox Testing

For data processing, the following formula is used:

$$\boldsymbol{Y = \frac{\sum(N.R)}{Skor\ Ideal} \times 100\%}$$

Source :(Rosano, 2019)

After processing the data, the values of the results obtained are interpreted using the categories in the following table:

Table 2. Assessment Category

Percentage (%)	Value Category
$0 < Y \leq 25$	Very Not Good
$25 < Y \leq 50$	Not good
$50 < Y \leq 75$	Good
$75 < Y \leq 100$	Very good

Source: Modified from (Ridwan, 2015)

Based on the beta testing results, the percentage results obtained are:

Table 3. Beta Testing

Kriteria	Persentase Penilaian
Fungsionalitas	**94,44**
Kendala	**91,67**
Kegunaan	**91,86**
Efisien	**95,83**
Pemeliharaan	**91,67**
Portabilitas	**83,33**
Rata-rata	**91,47**

Table 3. shows that the test results from the percentage table for assessing the library information system being developed are very good with an average assessment percentage of 91.47% on the functionality criteria with a percentage of 94.44%, on the constraints criteria. with an assessment percentage of 91.67%, on system usability criteria the assessment percentage was 91.86%, as well as on the criteria of efficiency 95.83%, maintenance 91.67%, and portability with a percentage of 91.47%.

4. DISCUSSION

The web-based library information system at SMK Negeri 3 Solok Selatan has gone through a direct testing process using the black box testing method. It can be said that the web-based library information system is valid.

Based on the test results above, several conclusions can be drawn that the library information system being built is a functional requirement that is expected to prevent errors. This information system can make it easier for librarians and library members to collect data on members, books, borrowing, returning and processing reports required by librarians.

Comparison of the researcher's results with previous research conducted by (Putri et al., 2022) namely in a library information system designed by researchers where library members can carry out loan transactions through the system, and the school principal can supervise the management of the library system. Apart from that, research conducted by (Raburga, 2023) This system consists of several pages, such as login, home, members, categories, books, loans, returns, reports and logout pages. With this library information system, admin tasks in managing data can be carried out more easily, and students can easily borrow and return books. As well as (Daru et al., 2021) The comparison with researchers designing library information systems is in the addition of a report section on book borrowing and returning activities.

It is hoped that the information system that researchers have designed can help librarians in registering library books, members, borrowing books and returning books,

and with this library system, it can save paper usage and time in the process of managing library reports. Researchers also hope that the SMK Negeri 3 Solok Selatan library will implement this system to facilitate the performance of librarians in managing the library. Researchers are aware that

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there are still many errors and shortcomings in system design and further development is needed so that this library system becomes even better in the future.

5. CONCLUSION

The design of a web-based library information system at SMK Negeri 3 South Solok was designed using the SDLC (System Development Life Cycle) method with the Waterfall model. Consists of 5 stages, namely: planning, analysis, design, implementation, maintenance. A web-based library information system using the CodeIgniter framework can overcome library management problems at SMK Negeri 3 Solok Selatan which are still not computerized. This information system has features, namely: 1) Manage member data; 2)Manage publisher data; 3) Manage admin data; 4) Manage loan data; 5) Manage book data; 6)manage book category data; 7) Print loan report; 8) Print book data reports. This system will be used at SMK Negeri 3 Solok Selatan, so this system can provide the following benefits:

1. With the availability of this system, it is hoped that it can help librarians as library administrators and use information systems in managing book and membership data, as well as making it easier to borrow and return books because it is computerized.
2. The library information system can make it easier for students to borrow books without having to write their name on the borrowed book because it is computerized.

From the conclusions above and the research that has been carried out, there are several suggestions that can be used as material for further consideration as an effort to improve the quality of the system that has been created. The suggestions in question are:

1. Update the existing interface system and information system, because as time progresses, features will appear that can make it easier for users to access the information system.
2. The information system that has been designed can be adapted to the needs and developments at SMK Negeri 3 Solok Selatan.

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