


## Design of a web based library information system at Bahrul Ulum Islamic middle school

Wiwin Winarti<sup>1</sup>, Aqhilla Qhoriza<sup>2</sup>

<sup>1,2</sup>Information Technology, Pamulang University, Jl. Raya Puspittek, Buaran, Kec. Pamulang, Kota Tangerang Selatan, Banten, Indonesia

Article Info	ABSTRACT
<b>Keywords:</b> First keywords, Second keywords, Third keywords, Third keywords.	At this time, information systems play an important role in improving business and educational efficiency. In the era of globalization, education needs to adapt to changes in thinking patterns and needs that are fast-paced, practical and precise. The presence of information technology is able to serve these needs. At Bahrul Ulum Islamic Middle School, library data management is still done manually, causing data inaccuracies, loss of book information, difficulty tracking loan status, and making reports that takes time and is therefore inefficient. The aim of this research is to design a Web-Based Library Information System Application at Bahrul Ulum Islamic Middle School. Data collection was carried out through literature study, observation and interviews. The software development method used is Rapid Application Development (RAD). By designing a web-based library information system application, it is hoped that it can improve the quality and performance of the application, minimize errors, ensure efficient use and improve services at the Bahrul Ulum Islamic Middle School library.
This is an open access article under the <a href="#">CC BY-NC</a> license 	<b>Corresponding Author:</b> Wiwin Winarti Information Technology, Pamulang University, Jl. Raya Puspittek, Buaran, Kec. Pamulang, Kota Tangerang Selatan, Banten, Indonesia <a href="mailto:dosen02374@unpam.ac.id">dosen02374@unpam.ac.id</a>

### INTRODUCTION

Developments in information technology have succeeded in opening up activities that were previously difficult or even impossible to do, but nowadays are very easy to do. (Prio et al., 2022) Currently, information systems have played an important role in improving the efficiency and effectiveness of business processes in a company. Utilization of information systems helps companies carry out more competitive business processes, where information systems can provide benefits and produce information that has value in improving business. (Mulyawan et al., 2021).

The increasingly rapid development of information technology in the current era of globalization can no longer avoid its impact on the education sector. These technological advances, utilizing computer devices as a medium for processing data, help humans in completing work. Schools, which are educational institutions, must also pay attention to developments in information technology. The education sector uses information technology

as an example in implementing information systems for school libraries. With the use of information systems, library management will become more effective. (Kurniawan & Widatama, 2023).

Information systems are an information technology that provides information to assist management decision making and provide appropriate information. In an effort to improve the performance of library services, the use of information systems is the right alternative or solution. Reasons for using information systems include comprehensive, integrated, integrated data and information management, producing fast and accurate information, reducing costs, and better security. (Rohmah et al., 2019) Libraries utilize information and communication technology in managing the process of borrowing and returning library books. (Pasaribu, 2021) Libraries are part of the sources of knowledge and learning that every school, college and region must have. Because the public and students can easily find information or knowledge through the library. A library is a unified work unit consisting of several sections, namely, the collection development section, the collection processing section, the user service section, and the facilities and infrastructure maintenance section. (Raharto et al., 2019).

The library is part of the learning resources that every school or college must have. Because students can easily find information or knowledge through the library. A library is a unified work unit consisting of several sections, namely, collection development section, collection processing section, user service section, and facilities and infrastructure maintenance section. (Kasmirin et al., 2016).

A library is an information system in which there are activities for collecting, processing, preserving, presenting and disseminating information. Libraries as they exist and are currently developing are used as information centers, sources of knowledge, research, recreation, preserving the nation's cultural treasures, as well as providing various other services. (Fatimah & Elmasari, 2018)

To develop interest in reading in school students, schools and libraries must work together to attract students' interest in reading. One of them is by providing a library at school. (Ariani et al., 2019) Bahrul Ulum Islamic Middle School is one of the educational units at junior high school level in Perigi Baru, Kec. Pondok Aren, South Tangerang City, Banten. In carrying out its activities, Bahrul Ulum Islamic Middle School is under the auspices of the Ministry of Education and Culture. At Bahrul Ulum Islamic Middle School, there is no web-based Library Information System. Management of data on borrowing and returning books is still done manually, which causes less accurate records that are not appropriate, loss of information on lost books, difficulties in tracking the status of borrowing books, as well as in making reports on data on borrowing and returning books which must be recapitulated manually. in the book which causes the library administration process at Bahrul Ulum Islamic Middle School to become less effective and efficient.

The aim of this research is to design a Web-Based Library Information System Application at Bahrul Ulum Islamic Middle School. Data collection was carried out through literature study, observation and interviews. The software development method used is Rapid Application Development (RAD). By designing this web-based library information

system application, it is hoped that it can improve the quality and performance of the application, minimize errors, ensure efficiency of use and improve services at the Bahrul Ulum Islamic Middle School library. The following are several studies that the author used as literature reference material in this research:

1. Web-Based Library Information System Design At SMK 1 LPPM RI Majalaya  
This research aims to design a web-based library information system using the waterfall method which is the best solution to solve problems in this library. Using the waterfall method makes system design easier and more targeted. And the existence of a web-based library information system increases students' interest in reading because they can access it anywhere and anytime without time limitations, and also makes it easier for staff to manage library data.(Sukiman & Ana, 2021)
2. Web-Based Library Information System At Frater Junior School Makassar  
This research aims to design a web-based information system at the Makassar Frater Middle School library and to implement the library information system that has been designed. This research was conducted from June to August 2015 at Makassar Frater Middle School. Data was collected using observation and documentation techniques. Meanwhile, the software used is PHP as a programming language, MySQL as a database manager. The results of the research show that a web-based library information system has been designed and tested at Makassar Frater Middle School which can produce information regarding the circulation of computerized library management effectively and efficiently.(Yusri, 2016)
3. Web-Based Library Information System Design At SDN 036 Ujung Berung, Bandung City  
The purpose of this research is to find out how library systems and procedures are currently running, to find out the design of web-based information systems in libraries, to find out testing of web-based information systems in libraries, and to find out the implementation of information systems currently running in the SDN036 Ujungberung City library. Bandung. The design of a web-based computerized library information system at SDN 036 Ujungberung, Bandung City, which is web-based, is expected to help library visitors such as borrowing and returning books and searching for books, as well as for library staff in checking the status of borrowing and returning, entering new book stock data and available, and preparing library activity reports for each month. (Rabbani et al., 2019)
4. Library Information System Design Web Based For Sunan Gunung Jati Islamic High School  
The research method used is research and development (R&D) with the Extreme Programming development method. Data collection methods use questionnaires, interviews and observations. The interview method is used to determine user needs, questionnaires are used to test the feasibility of usability aspects, while observation is used to test performance efficiency aspects. The result of the research is a web-based library information system using PHP language and a MySQL database server. The test results proved that the feasibility level of the web-based library information

system in the usability aspect for small groups was 84.22% with very feasible criteria and for large groups 91.2% with very feasible criteria, and the performance efficiency aspect was 98.64 with grade A. (Fatimah & Elmasari, 2018)

## METHODS

### Method of Collecting Data

The methodology consists of methods collecting data which includes literature studies, observations and interviews, as well as the research stages carried out from the initial process to the final process. (Aini et al., 2019) The following is an explanation of the methods that researchers used to collect data, namely:

1. Literature study where researchers study various related reference sources first
2. Observations are observations carried out directly by researchers on Bahrul Ulum Middle School library
3. Interview is a technique where This research was carried out by researchers through questions asked to staff Bahrul Ulum Middle School library as sources to get information.

### Application Development Phases and Stages

In designing an information system, it is necessary to carry out appropriate needs analysis so that it meets user needs and obtains appropriate benefits. (Tabrani et al., 2021) Kendall said that in RAD, there are three stages involving the analyzer and user, namely the assessment, design and implementation stages. These three stages are requirements planning, RAD design workshop, and implementation. (Subianto, 2020) The following are the stages of system development using the RAD method, this method consists of 3 (three) stages, namely Requirements planning, Design workshop, and Implementation.

#### 1. Requirements planning

This stage begins with identifying the needs and goals to be achieved in developing a web-based library information system. Next, a user needs analysis is carried out to ensure that the solution to be built meets existing needs. User needs analysis involves gathering information about the expected features and functionality of the proposed system. During this stage, the author conducted an in-depth analysis of business processes related to web-based library information systems. Analysis also involves identifying problems and challenges that need to be addressed in implementing the proposed system. The results of the analysis will be the basis for planning and designing a web-based library information system that is effective and in accordance with user needs.

#### 2. Design workshop

At this stage the author carries out the design process and makes improvements if there are design discrepancies between the user and the analysis. This stage will detail how the application will function and interact with users regarding existing business processes in the library, including book data collection, book categories, borrowing, returns and member data collection. The author will identify the workflow involved in each business process. Based on the planning requirements obtained, the

system modeling used is Unified Modeling Language (UML) which consists of several diagrams including Use Case Diagrams, Sequence Diagrams and Class Diagrams. Apart from that, a database model was created that describes the relationship between data using Entity Relationship Diagram (ERD) and Logical Record Structure (LRS).

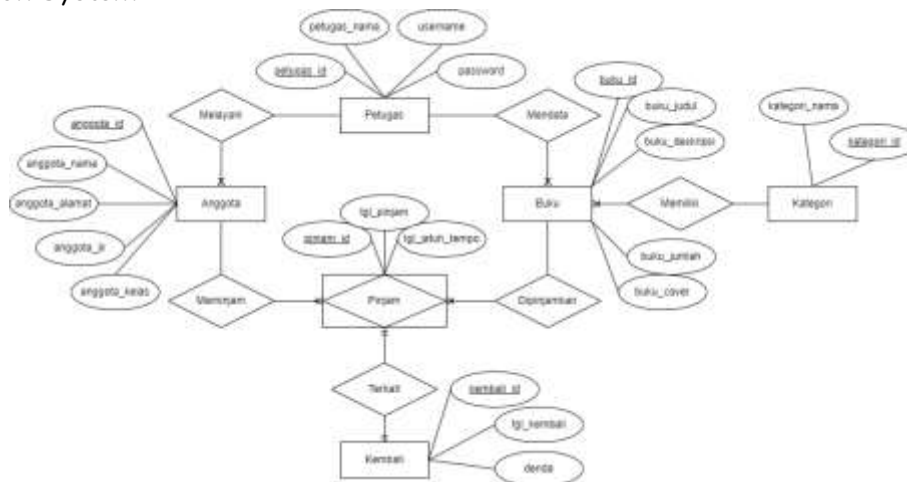
### 3. Implementation

The implementation stage is when the application development begins by the author. At this stage, the author will develop the application based on the design and specifications that have been determined previously. Furthermore, regular application testing will be carried out to ensure that the application functions properly and meets the specified requirements. Test results will be thoroughly evaluated to identify and fix any problems or bugs that may arise in the application.

## Database Design

### 1. Entity Relationship Diagram (ERD)

The following is the ERD design for the Bahrul Ulum Islamic Middle School Library Information System.



**Figure 1.** ERD Bahrul Ulum Islamic Middle School Library Information System

### 2. ERD to LRS transformation

The following is the transformation of ERD to LRS in the Bahrul Ulum Islamic Middle School Library Information System.

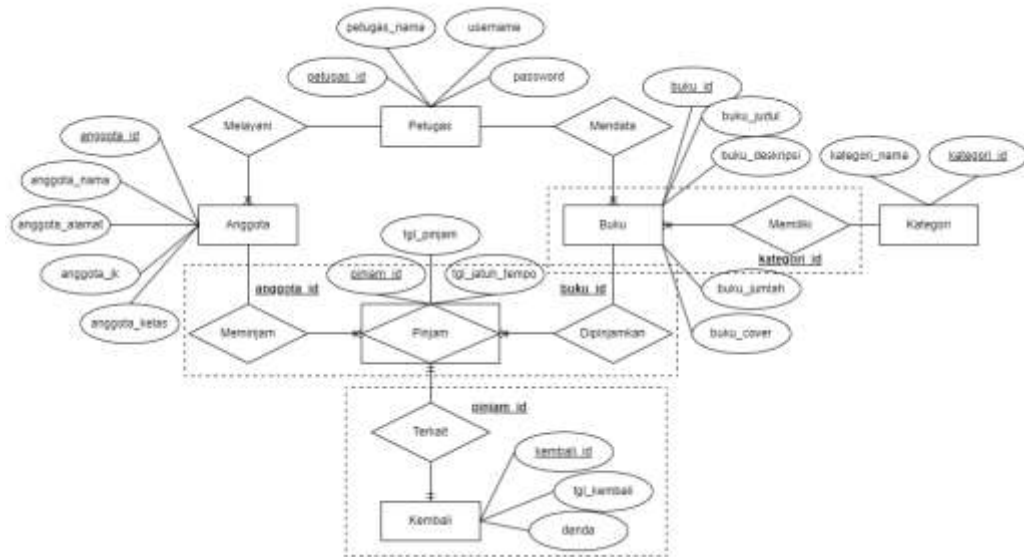


Figure 2. ERD to LRS transformation

### 3. Logical Record Structure (LRS)

The following is the LRS in the SMPI Bahrul Ulum Library Information System.

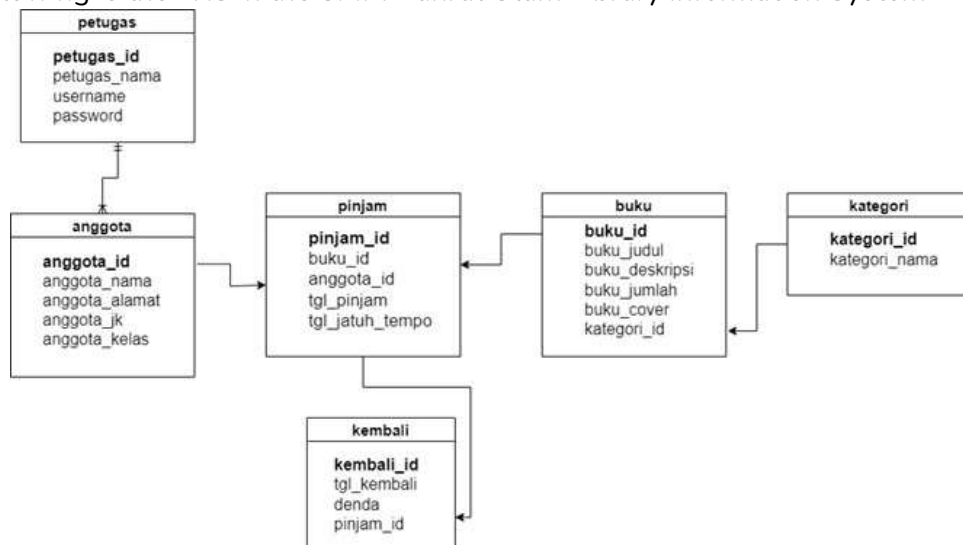


Figure 3. LRS Bahrul Ulum Islamic Middle School Library Information System

## RESULTS AND DISCUSSION

### Program Implementation

#### 1. Login Page



**Figure 4.** Login Page

The login page appears. In this form, users can enter the registered username and password to access the application's main page.

2. Home Page



**Figure 5.** Home Page

The main page is visible after the actor has successfully logged in. On this page, there are menus that can be accessed by actors.

3. Category List Page



**Figure 6.** Category List Page

The category list page is a page that contains information regarding category data for books. Actors can add, edit and delete category data.

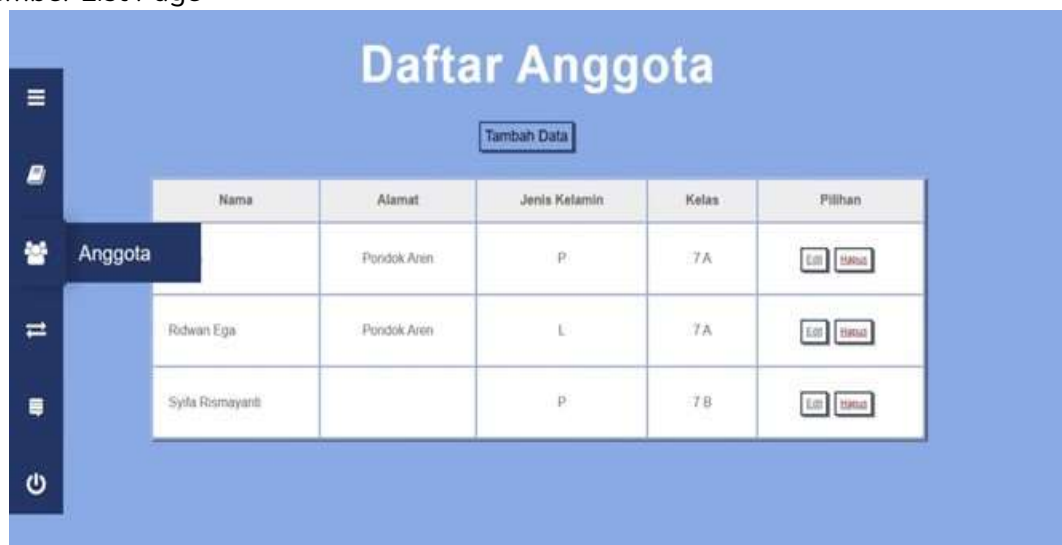
4. Form to Add Category Data



**Figure 7.** Form to Add Category Data

Displays a page containing a form to add category data. On this page, actors are given access to add category data and choose between saving the data that has been entered or canceling the addition process.

5. Member List Page



**Figure 8.** Member List Page

The member list page is a page that contains information regarding member data. Actors can add, edit and delete member data.

## 6. Book Borrowing List Page



Buku	Nama	Tgl Pinjam	Tgl Jatuh Tempo	Tgl Kembali	Status	Pilihan
Informatika SMP Kelas VI	Vella	13/07/2023	17/07/2023	-	pinjam	<input type="button" value="Kembali"/> <input type="button" value="Edit"/> <input type="button" value="Hapus"/>

Figure 9. Book Borrowing List Page

The book borrowing list page is a page that contains information regarding book borrowing data. Actors can carry out new transactions, edit, return loan data and delete loan data.

## 7. Book Borrowing Transaction Form

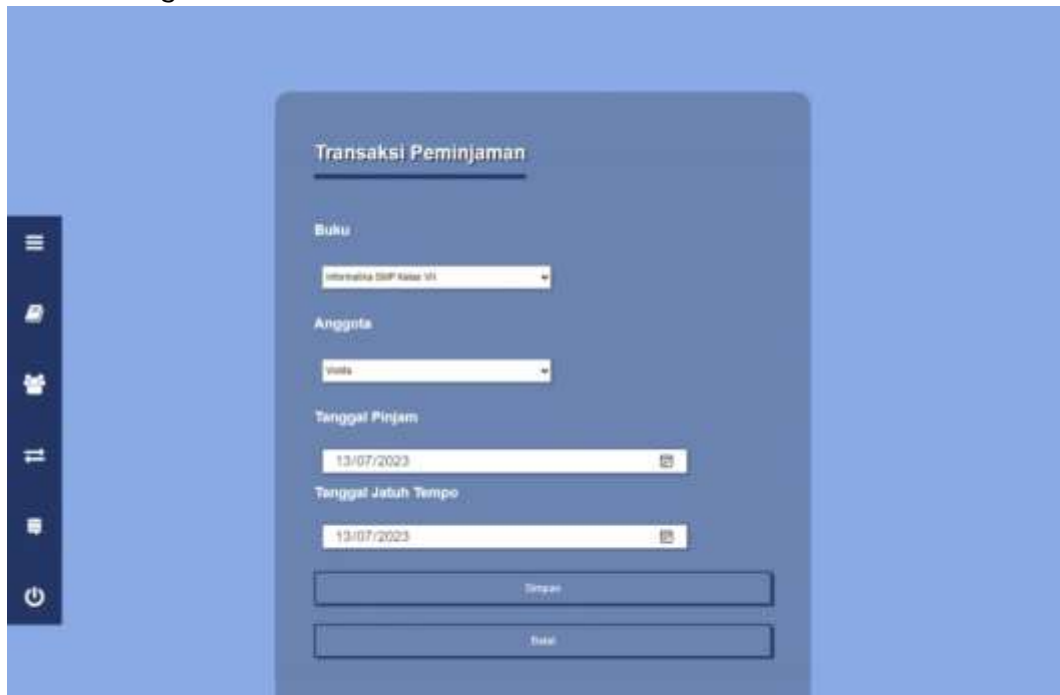


Figure 10. Book Borrowing Transaction Form

Displays a page containing a book loan transaction form. On this page, actors are given access to add loan data and choose between saving the data that has been entered or canceling the addition process.

8. Book Return Transaction Form

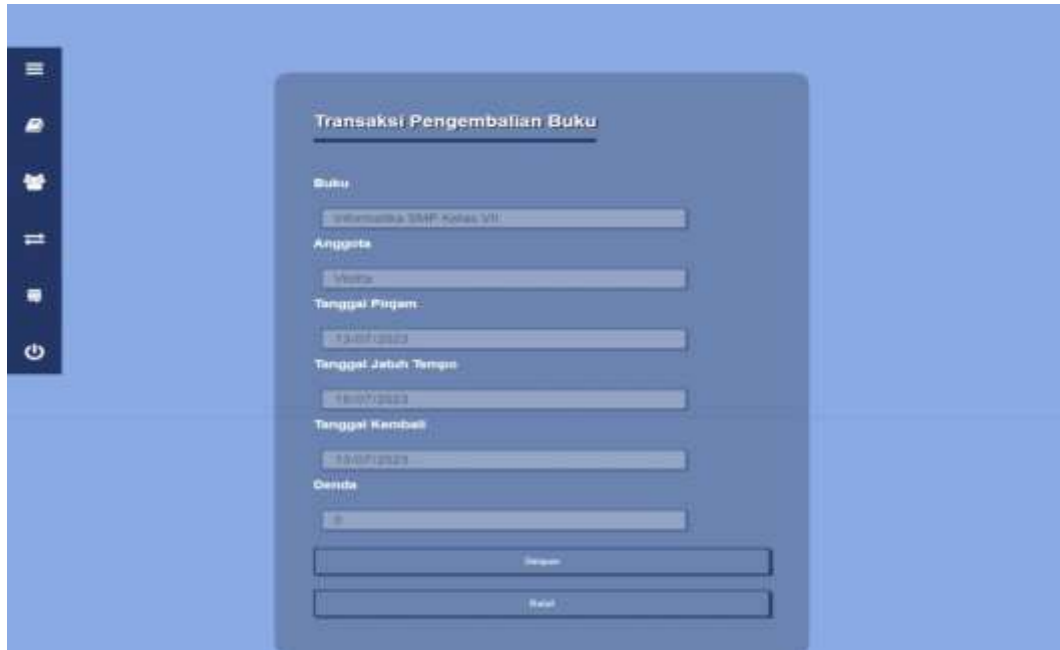


Figure 11. Book Return Transaction Form

Displays a page containing a book return transaction form. On this page, the actor is not given access to edit the data, the actor can only choose between saving the transaction that has been carried out or canceling the return transaction process.

9. Returns List Page



Buku	Nama	Tgl Pinjam	Tgl Jatuh Tempo	Tgl Kembali	Denda	Pilihan
Informatika SMP Kelas VII	Volita	2023-07-13	2023-07-18	2023-07-13	0	<input type="button" value="Batal"/>

Figure 12. Returns List Page

The book return list page is a page that contains information regarding return data that has been returned to the loan list. Actors can export data to excel or delete return data.

## CONCLUSION

The design of the Web-Based Library Information System Application at Bahrul Ulum Islamic Middle School using the RAD method has been created. The author concludes that the web-based library information system application is expected to improve the quality and performance of the application, minimize errors, ensure efficient use and improve services at the Islamic Middle School library Bahrul Ulum.

## REFERENCE

- Aini, N., Wicaksono, S. A., & Arwani, I. (2019). Pembangunan Sistem Informasi Perpustakaan Berbasis Web menggunakan Metode Rapid Application Development (RAD) (Studi pada: SMK Negeri 11 Malang). *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 3(9), 8647–8655.
- Ariani, F., Fahmi, M., & Taufik, A. (2019). *Inti Nusa Mandiri Dengan Metode Framework for the Application System Thinking (Fast)*. 14(1), 21–26.
- Fatimah, N., & Elmasari, Y. (2018). Perancangan Sistem Informasi Perpustakaan Berbasis Web Untuk Sma Islam Sunan Gunung Jati. *JUPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*, 3(2), 130–137. <https://doi.org/10.29100/jipi.v3i2.783>
- Kasmirin, A. R., Yusman, M., & Adipribadi, I. (2016). Perancangan Sistem Informasi Perpustakaan Berbasis Web (Studi kasus SMAN 1 Penengahan). *Jurnal Komputasi*, 4(1), 105.
- Kurniawan, Y., & Widatama, K. (2023). *Pengembangan Sistem Informasi Perpustakaan Menggunakan Metode Prototype*. 202–211.
- Mulyawan, M. D., Kumara, I. N. S., Swamardika, I. B. A., & Saputra, K. O. (2021). Kualitas Sistem Informasi Berdasarkan ISO/IEC 25010: Literature Review. *Majalah Ilmiah Teknologi Elektro*, 20(1), 15. <https://doi.org/10.24843/mite.2021.v20i01.p02>
- Pasaribu, J. S. (2021). Perancangan Sistem Informasi Perpustakaan Berbasis Web Di Smk Plus Pratama Adi Bandung. *Jurnal Ilmiah Teknologi Infomasi Terapan*, 7(2), 148–158. <https://doi.org/10.33197/jitter.vol7.iss2.2021.552>
- Prio, A., Lathifah, A., & Indriyanah, A. (2022). Literature Review Komponen Sistem Informasi Manajemen: Software, Database Dan Brainware. *Jurnal Ekonomi Manajemen Sistem Informasi*, 3(4), 344–360. <https://doi.org/10.31933/jemsi.v3i3.824>
- Rabbani, I., Syafariani, R. F., Si, S., & Stat, M. (2019). Perancangan Sistem Informasi Perpustakaan Berbasis Web pada SDN 036 Ujungberung Kota Bandung Design of Web-Based Library Information System at Ujungberung 036 Bandung Elementary School Library. *Elibrary.Unikom.Ac.Id*. [https://elibrary.unikom.ac.id/682/13/lhsanRabbani\\_10512317\\_Artikel\\_2.pdf](https://elibrary.unikom.ac.id/682/13/lhsanRabbani_10512317_Artikel_2.pdf)
- Raharto, T. B., Fawaati, T. M., & Nilasari, O. (2019). Perancangan Sistem Informasi Perpustakaan Berbasis Web (Studi Kasus Provinsi Lampung). *International Research on Big Data And Computer Technology (IROBOT Journal)*, 3, 3–5.
- Rohmah, N., Aryadita, H., & Brata, A. H. (2019). Pengembangan Sistem Informasi Perpustakaan Berbasis Web. *Informasi Dan Teknologi Ilmiah (INTI)*, 3(3), 2225–2234.
- Subianto. (2020). Penerapan Metode Rapid Application Development dalam Perancangan

- Sistem Informasi Pendataan. *Jurnal Infokam*, 16(1), 46–55.  
<http://amikjtc.com/jurnal/index.php/jurnal/article/view/218/164#>
- Sukiman, S., & Ana, S. (2021). Perancangan Sistem Informasi Perpustakaan Berbasis Web. *International Research on Big-Data and Computer Technology: I-Robot*, 3(1), 53–59.  
<https://doi.org/10.53514/ir.v3i1.50>
- Tabrani, M., Suhardi, & Priyandaru, H. (2021). Sistem Informasi Manajemen Berbasis Website Pada Unl Studio Dengan Menggunakan Framework Codeigniter. *Jurnal Ilmiah M-Progress*, 11(1), 13–21. <https://doi.org/10.35968/m-pu.v11i1.598>
- Yusri. (2016). Sistem Informasi Perpustakaan Berbasis Web Pada SMP Frater Makassar. *Jurnal Pilar Nusa Mandiri*, 12(2), 227–240.  
<http://ejournal.nusamandiri.ac.id/ejurnal/index.php/pilar/article/view/181/157>