*International Journal of Instruction and Smart Education*

ISSN
Vol 1, No 1, 2023

# Development of Digital Library Based on Senayan Library Management System (Slims) 9 Bulian at SMA Yapida Gunungputri Bogor

**Saefudin [a,*], Widyasari [b], Zainal Abidin Arief [c]**
[a,b,c] Ibn Khaldun University Bogor, Indonesia

**Corresponding author: saefudin.dhien@gmail.com*

**Abstract**

The purpose of this research is to develop a Digital Library based on Senayan Library Management System (Slims) 9 Bulian at SMA YAPIDA Gunungputri Bogor and test its feasibility and effectiveness. The research method used is Research and Development (R&D) with the development model used is the ADDIE model, which is integrated with the Waterfall model at the development stage. The research steps are analysis, design, development or coding, product trials, and evaluation. The subjects in this study were students of grade XII science. This study used the validation of 3 experts, namely design, media and material experts and conducted an effectiveness test using the N-Gain test. The findings in this study show that the development of digital libraries based on the Senayan Library Management System (SliMS) 9 Bulian is feasible and effective to use.

**Keywords:** development, digital, library, Senayan Library Management System

## I. Introduction

Nowadays we often hear the term library without wall, virtual library, digital library, virtual catalog both in everyday speech and in literature. These terms were previously only foreign terms and may not have any effect on librarians, especially librarians in Indonesia. But the term is now familiar to some of our librarians. This is because in recent years information and telecommunications technology (ICT) or known as ICT (Information and Communication Technology) and more specifically the internet network has increasingly penetrated all aspects of activities, including the library sector.

The condition and development of conventional libraries in Indonesia so far is not very encouraging and although the name is popular, it is not widely used by people. There are not too many library visitors, let alone those who use it (1). The lack of popularity of conventional libraries may be caused by the lack of attractive collections owned by libraries, for example because they are not Up-to-date, or an insufficient amount; less professional service; Inadequate facilities, and many more reasons can be put forward. The presence of digital libraries is expected to be a solution for conventional libraries which usually have limitations as mentioned above, including limited library collections.

Basically, digital libraries are the same as ordinary libraries, only they use computer-based work procedures and digital resources. Digital libraries offer users easy access to electronic resources with fun tools at limited time and opportunity. Users can use these sources of information without having to be tied to library operating hours such as working hours or library opening hours. According to (2) Digital Library is a library that manages all or part of the substance of its collections in computerized form as an alternative, supplement or complement to conventional

Received 16 February 2023, Revised 28 March 2023,
Accepted 22 April 2023, Available online 31 May 2023,
Version of Record 22 April 2023.

prints in the form of micro materials which are currently dominated by library collections.

Digital Library or Digital Library is an organization that provides resources and expert staff to select, compile, provide access, translate, disseminate, maintain unity and maintain the continuity of collections in digital format so that they are always available and inexpensive for use by a particular or specified community (3). Digital library according to Chisenga (3)(2) is an information service where all information sources are available in the form of computer processing results and have functions of procurement, storage, retrieval and access which are then presented which are all done with the help of digital technology. The digital library does not stand alone, but is linked to other sources of information and its information services are open to users around the world. Digital library collections are not limited to electronic documents in place of printed form, the scope of the collection even reaches digital artifacts that cannot be replaced by printed form.

The modernity of information media in the information age has given birth to various new innovations in the field of libraries and information, among others, resulting in various digital library innovations. The presence of information and communication technology in the library sector results in acceleration and accuracy in building library services. These technological sophistications include library automation systems, digital library systems, digital library network systems, electronic database systems and the internet. In the implication in society that advances in information technology give rise to the net generation (net generation) and digital natives in the information society.

Based on the researcher's interview with the Principal of YAPIDA Gunungputri High School, Bogor Regency for the odd semester period of the 2022-2023 academic year, currently the library has not utilized information technology, especially computerization for library management management, but if you look at the infrastructure facilities at YAPIDA Gunungputri High School, it already has adequate computer equipment with a computer laboratory, there are even computers specifically placed in the library school, but until now the school library has not used computers for managing library activities. This is due to the inability of school library managers in the management, data collection and management of school libraries using automation-based computers.

Judging from the results of the questionnaire questionnaire of YAPIDA High School teachers held on Monday, January 2, 2023, totaling 15 people, 80% stated that the library at YAPIDA High School has not been maximized in service, data collection, circulation, borrowing and returning books still using the manual method with data written in the ledger, 20% stated that they were maximized in service even though they still used a manual system.

Meanwhile, based on the researchers' observations by looking at student visit data to the library, it only reaches 30% of the number of students at YAPIDA High School so that it is categorized as still not optimal because it is caused by various factors including: the placement of books that do not match the catalog so that it is confusing, the data collection of books is still manual so that visitors find it difficult to find books, the search for books is still confusing and borrowing is not well recorded so that sometimes books exist which is lost because the data collection is not systematic.

Senayan Library Management System (SLiMS) is an open source Digital Library management system software licensed under GPL v3. The web application developed by a team from the Center for Information and Public Relations of the Ministry of National Education of the Republic of Indonesia was built using PHP, MySQL database and Git version controller. In 2009, Senayan won INAICTA 2009 in the category open source. (4) Senayan Library is a web-based Open Source Software (OSS) to meet library automation needs (Library Automation) small scale to large scale. With features that are quite complete and are still being actively developed. Senayan Library is very suitable for libraries that have many collections, members and staff in a network environment, be it a local network (intranet) or the internet (5).

As a form of appreciation and pride for Indonesia, starting from Senayan3-stable14, the release of the Senayan Library Management System (SLiMS) uses the code name of flora that grows in the archipelago. By using the name flora in Indonesia, the developers of the Senayan Library Management System (SLiMS) hope that the release of the Senayan Library Management System (SLiMS) can be a learning medium for users

ISSN
Vol 1, No 1, 2023

to find out the ins and outs of flora whose name is used as the code name for the release of the Senayan Library Management System (SLiMS) BULIAN.

According to (6) There are currently many FOSS (Free Open Source Software) that can be used to build automation libraries. However, FOSS developers do not guarantee the use of their products. In other words, if there is a software defect, FOSS developers do not guarantee to correct the existing flaw. For this reason, before choosing one FOSS that will be used to build library automation, libraries need to assess a FOSS before the FOSS is used. This assessment needs to be done so that the library does not choose the wrong one and regret later because it uses FOSS which has many weaknesses or shortcomings.

Of the various applications above, researchers prefer the Senayan Library Management System (SLiMS) 9 Bulian, because this application has a lot of features that can be developed by its users, in addition, Senayan Library Management System (SLiMS) Version 9 Bulian is one of the web-based Free Open Source Software that can be used to build library automation systems. Senayan Library Management System (SLiMS) Bulian 9 software is one of the open source software that has been widely used by school libraries, and has been tested for its ability to help handle library tasks and functions so that Senayan Library Management System (SliMS) can be recommended as library automation software in schools.

The advantages of the Bulian 9 Senayan Library Management System (SLiMS) software are; 1) Senayan Library Management System (SLiMS) can be obtained and used for free. Software is one of the important components in the implementation of library automation; 2) Able to meet the needs of library automation; 3) Senayan Library Management System (SLiMS) is built using PHP as a programming language; 4) Senayan Library Management System (SLiMS) developed by local human resources or developed by Indonesian human resources; 5) Able to run on Linux or Windows operating systems; 6) Have complete documentation; 7) Have clear development prospects.

Based on the background description and considerations described above, researchers need to develop a Digital Library based on the 9 Bulian library management system (SliMS).

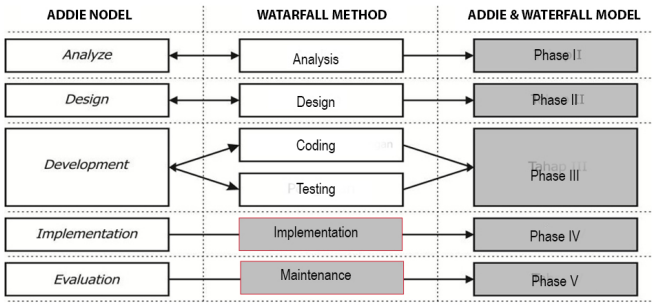
## II. Research Method

Research methods used in this study are research and development methods or Research and Development is a research method used to produce certain products and test the effectiveness of those products. To be able to produce certain products, research that is needs analysis is used and to test the effectiveness of these products so that they can function in the wider community, research is needed to test the effectiveness of these products (7).

The development of the instructional design model chosen in this study is a development model with a product approach by adapting the Addie development model which is integrated with the Waterfall model. The waterfall model is a classic model that is systematic, sequential in building Software. The name of this model is actually Linear Sequential Model and often called Classic Life Cycle or method waterfall. Called waterfall Because the stages passed must wait for the completion of the previous stage and run sequentially (8).

This research developed a web-based open source library automation system, namely Senayan Library Management System (Slims) 9 Bulian as a supporting application. This development adapts the development stages of the Addie development model and the Waterfall development method. The Addie development model is applied as an interactive media development model, while the Waterfall development method is applied as a supporting application development procedure. The development model is as follows:

*Table 3.2: Combined ADDIE and Waterfall Development Models*




Data analysis of research results was carried out using qualitative and quantitative approaches. Data in the form of suggestions and criticisms from experts / experts and students were ana-

lyzed with a qualitative approach, while data on feasibility, effectiveness and opinions regarding the suitability of Digital Libraries based on the Senayan library management system (SliMS) 9 Bulian were processed with a quantitative descriptive approach. After being studied, the data is needed to determine the success rate in conducting research.

## III. Results and Discussion

### A. Data Description

#### 1. Results of Needs Analysis

At this stage, the following data and information are obtained: 1) The process of managing data in the library at YAPIDA High School still uses a manual system, namely using a ledger and handwritten, so that data collection is not systematic; 2) The registration process for members at the YAPIDA High School library, made using polio books, manually collected one student by one; 3) Search for books in the library of YAPIDA High School, by directly searching every bookshelf in the library, without any special catalog so that it is difficult for visitors to find books in the library; 4) The loan and return process at the YAPIDA High School library has not been carried out because there is no accurate data on library members, it is feared that the books loaned are not recorded properly; 5) Regarding visitor data collection, it is still manual by filling in the guest list of library visitors; 6) Regarding the library system at YAPIDA High School, it needs to be updated and developed using a library automation system based on Slims 9 bulian so that services and data collection become more systematic.

#### 2. Due Diligence Results of Material Experts

The material review was conducted by a material expert, intended to assess the material aspects of the Slims 9 bulian-based library. The aspect assessed is the usability aspect.

Based on the results of the recapitulation of material experts in the picture above, the results of calculating the assessment of material experts obtained an average value of 94%, this average result when compared to the conversion table of the achievement level of the review results is included in the "Good" category. This means that the material developed is suitable for use in the development of a 9 bulian slims-based library at YAPIDA High School.

$$Percentage = \frac{Score\ (Skor)}{Maximum\ Score} \times 100$$

$$Percentage = \frac{47}{50} \times 100$$

$$Percentage = 94\%$$

*Figure 1. Percentage Results of Material Feasibility Test Results*

#### 3. Media Expert Due Diligence Results

Learning media experts will test the feasibility of this slims 9 bulian-based library. The assessment was carried out on three aspects, namely media display, program compatibility and accessibility and media presentation. Based on the results of the feasibility assessment of learning design experts, the percentage of learning design feasibility levels can be calculated as follows:

| No. | Scoring Aspect | Score | Max. Score | % Gain |
|---|---|---|---|---|
| 1 | Display | 32 | 35 | 91 % |
| 2 | Function | 69 | 75 | 92% |

*Figure 2. Percentage Results of Media Due Diligence Results*

Based on the results of the recapitulation of teaching media experts, it shows that the results of calculating the assessment of learning media experts are obtained on average 92%. This average result when compared to the conversion table, the achievement rate of the review results is included in the "Good" category. This means that library learning media based on Slims 9 Bulian is suitable for use in learning activities at YAPIDA High School.

#### 4. Design Expert Due Diligence Results

The next test in order to test the feasibility of developing this Slims 9 Bulian-based library is to test by someone who has competence in the field of instructional design. Tests were conducted on display and language aspects. Based on the results of the feasibility assessment of instructional

ISSN
Vol 1, No 1, 2023

design experts, the percentage of the feasibility level of instructional design can be calculated as follows:

$$\text{Percentage} = \frac{\text{Score}}{\text{Maximum Score}} \times 100$$

$$\text{Percentage} = \frac{37}{40} \times 100$$

$$\text{Percentage} = 93\%$$

*Figure 3. Percentage Results of Design Feasibility Test Results*

Based on the results of the recapitulation of instructional design experts, an average value of 93% was obtained This average result when compared to the conversion table of the achievement rate of the review results (Table 3.2) is included in the "Good" category. This means that the design of the development of a library based on slims 9 bulian at YAPIDA High School is feasible to use.

## 5. One to One Test Results

After making improvements to the prototype of the development of a slims 9 bulian-based digital library in accordance with the suggestions and revisions of experts, the results of the prototype were tested to students. Three students were selected from class XII IPA of YAPIDA High School Gunungputri Bogor. Based on the results of the one to one test, the average percentage of the feasibility level of the prototype is as follows:

$$\text{Percentage} = \frac{\text{Score}}{\text{Maximum Score}} \times 100$$

$$\text{Percentage} = \frac{191}{225} \times 100$$

$$\text{Percentage} = 85\%$$

*Figure 3. One to One Test Results Percentage*

Recapitulation of one to one test results to three students of grade XII of YAPIDA High School material for each aspect of assessment is shown the following table and graph:

*Table 1. One to One Test Results Recap*

| No | Assesment Aspect | Score | Max. Score | Attachment (%) |
|---|---|---|---|---|
| 1 | Use | 128 | 150 | 85% |
| 2 | Display | 63 | 75 | 84% |

Based on the results of the recapitulation of the one to one test in table 4.5 shows the calculation of the average value for the usability aspect of 85%, the display aspect of 84%. In general, the average result of this one to one test shows a percentage of 85%. The value if this is compared to the conversion rate conversion table of the review results (Table 3.4) is included in the "Good" category. This means that this prototype is suitable for use in the development of slims-based libraries at YAPIDA High School Gunungputri Bogor.

## 6. Field Trial Results

After making improvements to the prototype of the development of a slims 9 bulian-based digital library in accordance with the advice and revision of experts, the results of the prototype were tested to students, by conducting field trials involving 30 students of class XII IPA of YAPIDA High School Gunungputri Bogor. A recap of the field test results can be seen in the appendix. Based on the results of field test calculations, the average values are obtained as follows:

$$\text{Percentage} = \frac{\text{Score}}{\text{Maximum Score}} \times 100$$

$$\text{Percentage} = \frac{2070}{2250} \times 100$$

$$\text{Percentage} = 92\%$$

*Figure 4. Percentage Results of Field Trial Results*

*Table 4.6 Recap of Field Test Results*

| No | Assesment Aspect | Score | Max. Score | Attachment |
|---|---|---|---|---|
| 1 | Use | 1382 | 1500 | 92% |
| 2 | Display | 688 | 750 | 92% |

Based on the results of the field test recapitulation, it shows the calculation of the average value for the usability aspect of 92%, the display

aspect of 92%. In general, the average results from the field of these 30 students show an average percentage of 92%. The value if this is compared to the conversion rate conversion table of the review results (Table 3.4) is included in the "Good" category. This means that this prototype is suitable for use in the development of a slims 9 bulian-based library at YAPIDA High School Gunungputri Bogor.

### 7. Product Effectiveness Test Results

Testing the effectiveness of the Slims 9 Bulian-Based Library Development System at YAPIDA High School was carried out by comparing pre-test results and post-test results. This test was conducted on 30 students using N-Gain calculation. Based on the results of the N-Gain test analysis as follows:

$$N\text{-}Gain = \frac{Postest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}$$

$$N\text{-}Gain = \frac{1320 - 938}{1500 - 938}$$

$$N\text{-}Gain = 0{,}67 = 93\%$$

*Figure 5. N-Gain Test Results*

Based on the results of the N-Gain calculation, the average N-Gain value is 0.76. If converted with Table 3.6, a percentage of 76% is obtained and categorized as "Moderately Effective". So it can be said that the development of a library based on Slims 9 bulian at YAPIDA Gunungputri High School is quite effective to use.

### B. Discussion

The development model used is Addie which is integrated with the Waterfall model at the development stage or coding Slims 9 bulian. The selection of this model is based on consideration of a complete, detailed and systematic process integrated with a very specific Waterfall model for software or application development.

The feasibility test of the Slims 9 bulian-based digital library is determined based on the results of the assessment of library material experts, learning media experts and instructional design experts. The results of expert testing of library materials obtained a percentage of 94%. Learning media experts assess two aspects, namely usability and appearance. For testing by media experts on aspects of media usability, program accessibility and compatibility, and media presentation obtained a percentage of 92%. Testing by instructional design experts for usability aspects obtained a percentage of 93%. Based on the test results of the three experts, the library development model based on Slims 9 bulian is categorized as "Good" so that it is suitable for use at YAPIDA Gunungputri Bogor High School.

The calculation of N-Gain shows a value of 0.76 or 76%. Based on the results of these calculations, the development of a Digital Library based on Slims 9 bulian at SMA YAPIDA Gunungputri Bogor is effective.

## IV. Conclusion

From the results of the data description that has been described with discussions carried out in accordance with previous theories and research that has been carried out, it can be concluded that the development of a digital library based on the 9 Bulian senayan library management system (SliMS) at SMA YAPIDA Gunungputri Bogor can be significantly said to be feasible and effective for use. Therefore, the development of digital libraries can be a special concern, so as to be able to make solutions to student literacy problems.

## References

1. Saleh AR. Pengembangan Perpustakaan Digital. Tangerang Selatan Univ Terbuka. 2019;2:480 hlm., 21 cm.
2. Obradovich A, Canuel R, Duffy EP. A Survey of Online Library Tutorials: Guiding Instructional Video Creation to Use in Flipped Classrooms. J Acad Librariansh [Internet]. 2015;41(6):751–7. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0099133315001640
3. Orsi PIC. What Do You Mean by a Periodical? Forms and Functions. Hist Med Univ Oxford. 2016;(September):325–41.
4. Silbeschatz A. Database System Concepts. New York: McGraw Hill; 1998.
5. Nasrullah N, Tawakkal, Nursalsabila. Analisis Penggunaan Senayan Library Management System (SliMS) Di Perpustakaan Madrasah Aliyah Negeri 1 Majene Provinsi …. Lit Trends Libr …. 2022;3(2):99–111.

ISSN
Vol 1, No 1, 2023

6. Card S, Nielsen J. Series Editors. German-Turkish Relations Revisited. 2019. 285–286 p.
7. Neuman WL. Social Research Methods: Qualitative and Quantitative Approaches. Pearson Education. 2011.
8. Walliman N. Research_Methods_The_Basics_Nicholas. London: Routledge; 2011.