

Development of Slims Framework Modification and Migration for Library Information System in Electrical Engineering Department, Diponegoro University of Indonesia

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ABSTRACT

Many libraries have been built for the library management system in a more active era of development, one of which is Slims. Slims is an open-source library management system that aims to simplify book search management while expanding existing capabilities. The Department of Electrical Engineering library initially used a PHP 4 website; however, in the present development, the library is innovating by adopting Slims based on PHP 7.4. The rationale for the change is that the former website had flaws, such as insufficient search tools, a lack of available book data, a less appealing website design, and a manual borrowing process. As a result, inventions and modifications are made to address these flaws. It's vital to map the previous data to make transferring data more accessible. Matching fields from several datasets into a schema or database is data mapping. Thus, innovation and modification are carried out to make it easier for librarians to maintain the library system.

Key Words: Websites, Slims, Mapping data, Libraries

1. INTRODUCTION

The evolution of information technology has influenced the growth of today's library world. The usage of library information systems is one (Effendi et al., 2004). Libraries' websites significantly impact librarians' ability to keep and change data for books, journals, theses, and other knowledge sources. In addition, the library's website makes it easier for library members to view what books are available in the library. As a result, if the library does not have a website, information on the availability of books in the library will be more challenging to come across. Currently, technological advancements are applied in education and in the library, where a digital library exists. A digital library is a collection of information services that allow users to access content via digital devices. Slims framework was created by the Ministry of Education's Information Center and Public Relations Team. Book data, members, and bookmarks for a book in the library can be entered using features in the Slims. There are bibliographies, circulation, membership, and control lists as a feature in Slims. Bibliographies help a librarian organize data. Slims has already achieved its ninth edition, which includes various new features such as admin access, filling in book data and data for all members and library administrators, and public key, available to anybody. In a public library, we can quickly borrow books and check whether or not they are available. Slims also offers a library management system that incorporates a computerized method for processing library data, categorizing collections, processing member data, and integrating borrowing and returning (Saputra, 2018). Slims management information system uses an online OPAC data structure (Integrasi et al., 2017).

Diponegoro University's Department of Electrical Engineering now has a website-based library service. The webpage for the Department of Electrical Engineering is currently pretty complete. The library website for the Department of Electrical Engineering now offers primary navigation and many search capabilities for journals, papers, final project reports, and books. There is also a feature to upload books and other periodicals to the librarian portion of the Department of Electrical Engineering library website. However, despite the many benefits of the Department of Electrical Engineering's library website, a few elements still need to be tweaked, such as the addition of a research report search option, an online book purchase feature, or the ability to add data to a book. Slims also benefit from making it easier for library patrons to access and borrow books. Slims has a feature such as the monthly addition of book information, the availability of books in the library, and a summary of borrowing data. As a result, the authors attempt to modify the framework to adapt to the old features and provide convenience for library members and library administrators to access the library website by converting the current Department of Electrical Engineering library website into a national library website. Slims 9 "Bulian" and the author will use the Altova MapForce software to move the data from the old library.

Based on the preceding, the problem can be stated as follows. First, there is a transfer problem from the previous website to Slims 9 "Bulian" without losing data and structure. Many custom fields are not available in the Slims, so there is a need to prepare a custom field in Slims. Second, there is an issue in Slims module usage because Slims is a framework to extend the functionality based on the newly created custom field. Third, Slims 9 "Bulian" handles adjusting the previous data to align with the business process with Slims 9 "Bulian." Based on the problem that happened, three research aims must be done. First is analyzing the process of transferring data from a website at the Department of Electrical Engineering, Diponegoro University. Second, designing the data model transfer to ensure that the previous system's data could align with the following Slims. Third, modify the Slims module function to search and use the data parameter as the previous system.

2. THEORETICAL FRAMEWORK

2.1 Data Mapping

Combining fields from many datasets into a schema or database is known as data mapping. Increase data, ingest data, process data, and manage data using Data Mapping. Data mapping aims to combine multiple data sets into a single one. Data Mapping refers to the collection of inconsistencies that are used to identify similar points that may be carefully merged and used for the end destination. KbRS exists and demonstrates that various systems can store data in XML format. The XSLT language can be used for data conversion and integration between KbRS and DES systems in data mapping approaches. The author uses Altova MapForce to accomplish data mapping (James, 2020). Figure 1 shows the usage of Altova in mapping the old database to the new database.

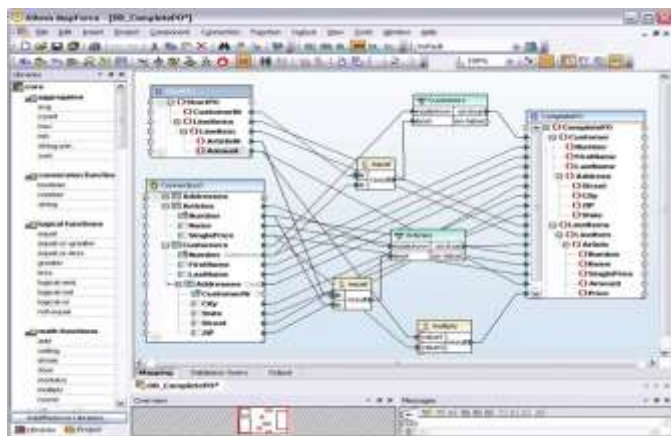


Figure 1: Using Altova MapForce to Do Data Mapping

2.2 Altova Map Force

Altova MapForce is a multi-faceted visual data mapping tool published in October 2005 with WSDL and complete support for XML, relational databases, flat files, and EDI messages (EDIFACT and ANSI X12). Because WSDL exists, MapForce mapping assistance can automate the deployment of web services. This method allows for the visual representation of data sources and operations. MapForce's automated code can be utilized for server-side service implementations (Cavanaugh, 2006).

MapForce also has a graphical interface with various options for managing, displaying, manipulating, and executing individual and complex mapping projects, which can help with data integration. Use the design panel to create mapping components by dragging connections to change source and target formats and adding functions and filters to alter data.

2.3 Slims 9 "Bulian"

Slims software is an open-source library management system that is offered under the GPL v3 license (Sanjaya & Mayesti, 2021). The information center and public relations of the Ministry of National Education of the Republic of Indonesia built this software using MySQL, PHP, and Git. Slims Software allows users to obtain information services more quickly and efficiently than they could manually, and library catalog searches can be performed in locations other than the library because Slims software is used online.

This software can be used to create digital libraries as well. Slims includes eleven Slims features, including Home, OPAC, Bibliography, Circulation, Membership, Master File, Inventory, System, Reporting, Serial Publishing Control, and Attendance Module. Another feature is integration with a library that can track processing activities such as the Online Public Access Catalog (OPAC), bibliography services, membership management, reporting, and publishing control (Sanjaya & Mayesti, 2021). The graphic below shows an example of a Slims-enabled library website.



Figure 2: Slims-Based Library Website

2.4 Database Management System (DBMS)

A database management system (DBMS) is software that describes, maintains, controls, and grants access to a user's database. A database management system (DBMS) can alternatively be defined as a piece of software that allows programs to obtain data without constructing a new database (Maulana, 2016).

2.5 MySQL

MySQL is a Relational Database Management System (RDBMS) that allows us to store data using coordinates (Pinem, 2018). A relational database management system (RDBMS) is a tool that will enable us to utilize, manage, and generate data using a relational paradigm. The MySQL database system supports the PHP programming language. MySQL uses ANSI that numerous standardized standards for the use of SQL. MySQL has several advantages, including:

- a. MySQL is faster than other databases and is simple to set up because MySQL does not require an expert to manage its administration.
- b. When establishing a table, MySQL can create a huge table. Each table can store a maximum of 4 GB of data, up to the maximum amount that can be obtained.
- c. MySQL is a free software program. As a result, MySQL is less expensive than competing databases.
- d. MySQL and the PHP programming language are inextricably linked. As a result, no additional setting is required while utilizing the PHP programming language.

2.6 PHP

PHP (Hypertext Preprocessor) is an open-source programming language that may be used to create a website that works with other languages such as HTML, XML, javascript, and databases. PHP is a server-side programming language that handles data. Another way, the server will translate a software script and provide the results to the client. PHP is usually used to design APIs, and website apps can exchange databases using the PHP programming language. The PHP programming language is demonstrated in the following example (Rahmat, 2018). Figure 3 shows the example of PHP programming language usage.

```
77 // modulus
78 // $a_title = $row['a_title'];
79 // $a_title = $row['a_title'];
80 // $a_title = $row['a_title'];
81 // $a_title = $row['a_title'];
82 // $a_title = $row['a_title'];
83 // $a_title = $row['a_title'];
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106 // $a_title = $row['a_title'];
107 // $a_title = $row['a_title'];
108 // $a_title = $row['a_title'];
109 // $a_title = $row['a_title'];
110 // $a_title = $row['a_title'];
111 // $a_title = $row['a_title'];
112 // $a_title = $row['a_title'];
```

Figure 3: PHP programming language example

A working system for the PHP programming language begins with receiving requests from a website. The browser will now look for a webserver address, identify the page, and provide the appropriate information. In addition, the webserver will search the file, and it will be translated and shown in the browser (Rahmat, 2018). PHP provides several advantages over other web programming languages, including the following:

- a. PHP programming language does not compile in its use.
- b. Many web servers support PHP programming languages such as Apache, IIS, Lighthttpd, to Xitami with low configuration.
- c. The number of mailing lists developers is developing to make it easier to develop.
- d. Has a lot of references and documentation, so it's easy to understand
- e. It can be used on various Linux, Microsoft, and Unix machines and run at runtime using the console.

2.7 Object-Oriented Programming

Object-Oriented Programming (OOP) is an object-oriented programming technique that organizes software as collections of objects carrying data (Danuri, 2009). Object-Oriented Programming is now commonly used because the old way presented numerous challenges when transferring findings from one development to the next. There are multiple advantages to using Object-Oriented Programming, including.

- a. Issue-related classes and objects can still be reused, increasing productivity.
- b. When analyzing and designing, the Object-Oriented Programming method is developed correctly and correctly. As a result, there are fewer coding errors.
- c. When patterns are separated, they tend to become fixed and stable. This pattern simplifies maintenance.
- d. When undertaking design and coding analysis, inheritance and usage properties are the same.
- e. The approach to development is more realistic, and the result is more consistent.

Taking an approach can reveal problems in the Object-Oriented Programming system. The object-oriented programming data is grouped in a component that acts like an object, with varied inheritance features. This group of the object will yield the required result.

3. ANALYSIS AND DISCUSSION

3.1 Altova MapForce Data Mapping

Altova Mapforce is a tool for translating data and mapping graphical data. Because Altova MapForce can make it easier to transfer data in ancient libraries and has numerous features to change the data format of old libraries, the author employs it. The author discusses how to use Altova MapForce in this sub-chapter.

3.1.1 Data Mapping Process using Altova MapForce

The data mapping is completed by mapping the feature in the old database to the new database with many field change variations and data characteristics based on the different business processes of the old and new applications. The data mapping process is carried out with the help of software developed by Altova. Altova MapForce is a specialized package with many data drivers with GUI mapping capability. There are various steps to transferring data with Altova MapForce. The procedure of mapping data that must be done is like this:

- a. Installation of Altova MapForce

Altova MapForce is accomplished by downloading the entire package from the Altova group. The author used the Altova 2013 edition in this research.

- b. ODBC Connections Customization

Following the installation of Altova MapForce, the following step is to download MySQL Connectors compatible with the computer's operating system.

- c. Create a database and a DSN.

Open the Altova MapForce software when it has been downloaded, and when the main page displays, click insert database in the top right corner. Select the ODBC Connections menu from the Insert Database menu. Then, create a new DSN and pick the MySQL ANSI Driver for the DSN user. After that, fill in the data below and select the previously added DSN. Figure 4 shows the process of inputting the DSN for database configuration.

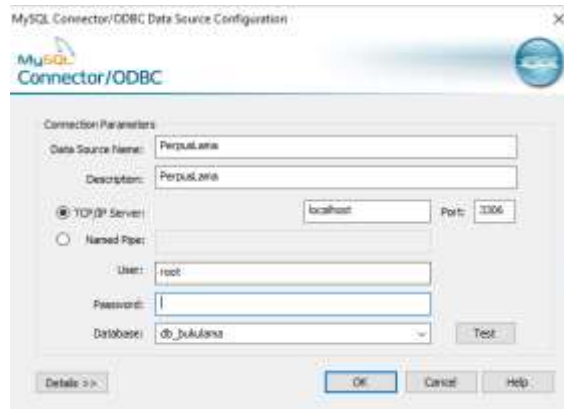


Figure 4: Filling configuration data on MySql Connector

d. Mapping Data Process

Data mapping is the final step. This method aims to match tables in one database to tables in another database. Figure 5 is an example of mapping data on Altova MapForce.

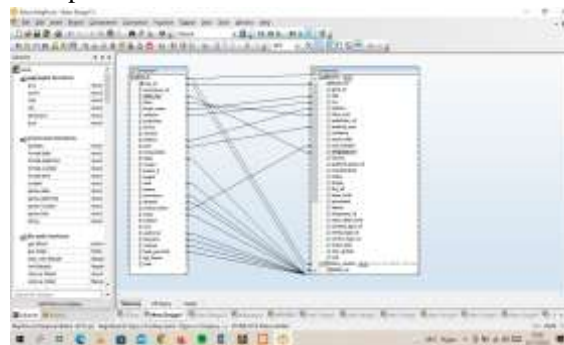


Figure 5: Mapping Data Process using Altova Map Force

Sending table data to other tables is how data mapping is done. The following data transfer was performed on the Electrical Engineering old Information System to the Slims new Information system library databases using Altova MapForce.

3.1.2 Data Mapping Process in Slims

a. The procedure for converting book information into a Biblio table.

The Biblio table is used to hold book data on the admin page. Row id, class no, ISBN, book name, authors, edition, year, and class number were among the table's data that were moved into the Biblio. The following diagram depicts transferring book data to the Biblio table. Figure 5 shows the field mapping from the old book table to the new Slims Biblio table. The output results can be observed in Figure 6 if the data transfer from the book to the Biblio table has been determined.

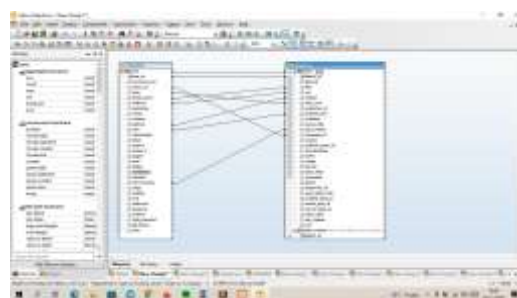


Figure 5: Mapping Book Data to Biblio Table



Figure 6: Result of mapping book data to Biblio table

b. Adding information about books to the Biblio custom table.

The Biblio custom table is used on the admin page to hold additional book data. Row id, location, origin, inventory, abstract, copy, authors, keyword, subject, publisher, and city of publish are the columns of the table relocated to Biblio custom. Figure 7 depicts moving book data to the Biblio custom table. There is no specific function in mapping book data to the additional Biblio custom table. The old book table is mapped to several tables in the Slims database. The output results can be observed in Figure 8 if the data transfer from the book to the custom Biblio table has been determined.

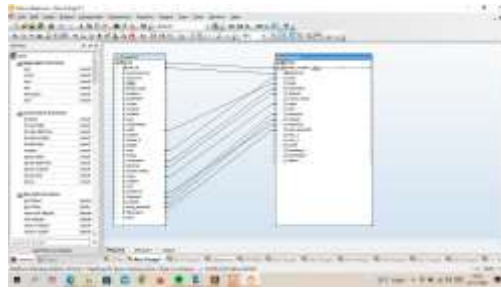


Figure 7: Mapping Book Data to Biblio Custom Table



Figure 8: Result of mapping book data to Biblio custom table

c. Adding book information to the search Biblio table

The search Biblio table stores additional book data on the admin search view and the main page. Class no, ISBN, book name, authors, publisher, edition, year, collation, and class number are the columns in the table that are migrated to search Biblio. Figure 9 shows the mapping process from the part of the book table to the search Biblio table. There are checking conditions and the equality of the parameter function because many columns need to be processed, combined, or separated.



Figure 9: Mapping book data to table search_biblio

The data transfer procedure described above differs from previous data transfer techniques because there are variations between the linguistic data and the new data variables. The old data used a number variable to denote the book's language, whereas the new data used a letter variable. Furthermore, the old data required separate searches for books, journals, papers, practical work reports, and final project reports. In contrast, the new data required marking to expedite the search for books, journals, articles, practice work reports, and final project reports. Figure 10 shows the results of the data transfer in the book to the search Biblio table has been determined.



Figure 10: Results of mapping book data to the search_biblio table

d. Adding library member information to the member's table

The member table is used to store information about library members. Member code, member name, gender, member address, telephone, and email are the fields in the table passed to members. The following diagram depicts moving library member data to the member table. Figure 11 shows the mapping diagram between library member data to the new Slims member data.

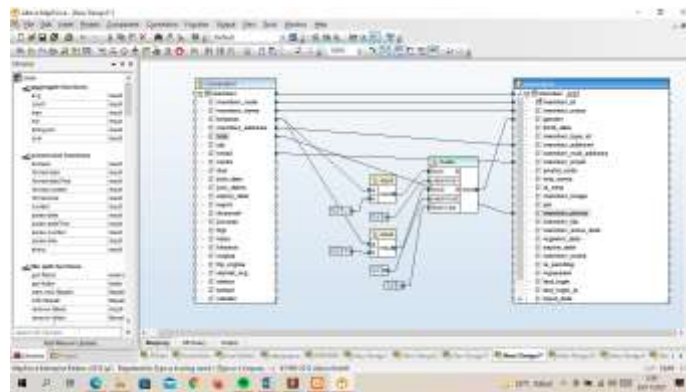


Figure 11: Mapping library member data to the member's table

There are significant discrepancies in the data of library members, particularly in the provision of gender markings. The earlier data had a letter variable, whereas the new data had a numeric variable. The following figure shows the output results if the transfer of library member data to the member table has been decided. Figure 12 shows the query result that must be executed from the mapping process.



Figure 12: Results of mapping library member data to members table

e. Copying library member information to the member custom table

Additional library member data is stored in the member custom table. Member code, lecturer, special, parents, parents_telephone_number, organization address, status, appearance, and notes were all transferred from the table to member custom. Figure 13 shows the mapping process of the library member to another table, the member_custom table. Figure 14 shows the output results of transferring library member data to the member custom table.

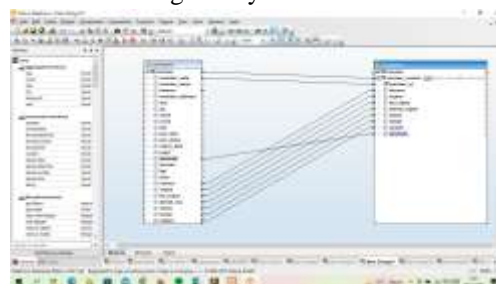


Figure 13: Mapping library member data to table member_custom



Figure 14: Results of mapping library member data to table member_custom

3.1.3 Query Transfer Process to PHPMyAdmin

Query transfer process accomplished by transferring the received output to a SQL table in PHPMyAdmin. However, there is a flaw in the procedure of sharing this data. The disadvantage is that the Altova MapForce output does not include a semicolon sign or a ";" sign after each SQL operation. Due to the need to manually enter a ";" terminator.

3.2 Using the Admin Menu on Slims

3.2.1 Dashboard

The home menu is used to rapidly find out what books are in the library and read alerts for borrowers who have overdue loans. The most recent loan data visualization could be seen on the home menu. The librarian can customize which submenu should appear in the shortcut settings submenu from the homepage submenu. Figure 14 shows the dashboard and the main menu.

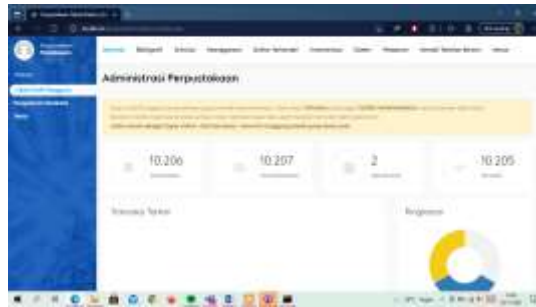


Figure 14: Menu in Slims

3.2.2 Bibliography

The bibliography menu is used to enter book data and print data related to books, such as labels, barcodes, and catalogs. In the bibliography menu, there are many sub-menus, including:

a. Bibliography

There are two sub-menus in the bibliography section: a bibliography list and adding a new bibliography. The bibliography list in the submenu is used to manage the books that have been entered. We can update and delete book information by going to the bibliographical list sub-menu. There are some options to modify the book bibliography in the list. Then there is the edit and delete choices that could edit information and erase the book. Figure 15 shows the process of changing the book data in Slims.

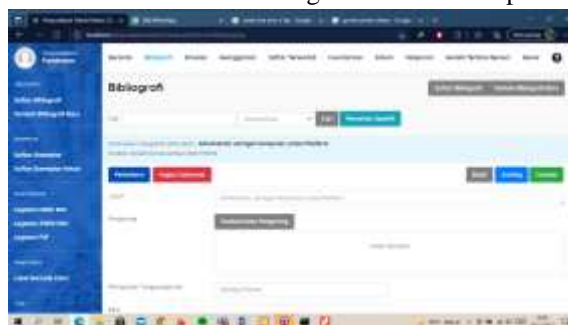


Figure 15: Changing book data on Slims 9

In addition, we can add a new bibliography in the bibliography section by pressing the sub-menu area to add a new bibliography. After that, Figure 16 shows the add new bibliography window.



Figure 16: Add New Bibliography

b. Section of Copy

There are two sub-menus in the copies section: the list of copies and the list of outgoing documents. The list of copies submenu is used to display a list of the book's code copies and to update the primary code contained in the book. Separating book types is also done with copy codes. The contents of the list of copies can be changed in the same way that the book data can be changed. There is also a list of outgoing documents, which may be used to look at books that library members have borrowed.

c. Catalog Section Copy

There are three submenus in the copy catalog section: MARC SRU services, Z3950 SRU services, and P2P services. The MARC SRU service sub menu is used to transfer book data from the national library of Indonesia to the Electrical Engineering Slims library. To transfer book data from the Library of Congress SRU Voyager to the Electrical Engineering Slims library, use the Z3950 SRU service sub-menu. Meanwhile, the P2P service sub-menu transfers book data from the Electrical Engineering Slims library to the Slims external library. The following is an illustration of one of the services for relocating books. Figure 16 shows the copy catalog feature in the Slims information system.

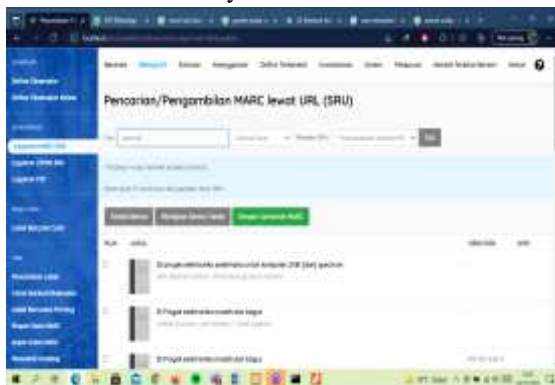


Figure 16: Use of the copy catalog feature on Slims

d. Tools

Several sub menus in the tools section may be used to do Biblio export and import, exemplar export and import, MARC export and import, and label and barcode creation. Slims's barcode print could be done by accessing the submenu label barcode color. After that, the book could be entered into the queue to be later printed in the collection. Figure 17 shows the example of a barcode that could be printed and pasted to the book.

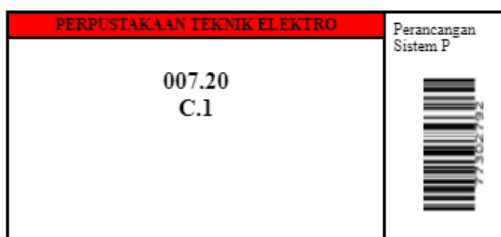


Figure 17: Example of label and barcode display on Slims

3.2.3 Circulation

The circulation menu is used to look up information on members who borrow books from the library. All sub-menus in the circulation menu are starting transactions, flash returns, loan regulations, loan history, a list of delays, and reservations. The following is an example of using the circulation sub-menu.

1. Transaction Begin



Figure 18: Sub-menu starts transactions on Slims

The start transaction submenu is shown in Figure 18. Start transaction sub-menu used to monitor member delays, make reservation approvals, and view member borrowing history. This sub-menu could be accessed by searching for the member's id. The librarian can check and validate the return or borrowing of books after locating the member ID.

2. Reservation Data Delay

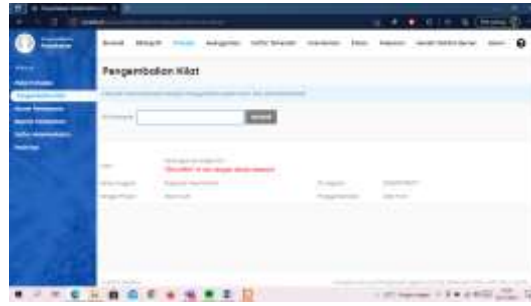


Figure 19: Sub-menu flash return on Slims

Figure 19 shows the sub menu for quick process. This sub-menu is used to return books quickly. The method of using this sub-menu is by doing a search for the code copy of the book. After the book copy code is found, the borrowed book will be returned automatically.

3. Rule of loan



Figure 20: Sub-menu flash return on Slims

A submenu of lending rules is shown in Figure 20. This submenu creates borrowing rules for the books you want to borrow. Fines and the due date for returning books borrowed by library members are among the rules.

4. Loan history

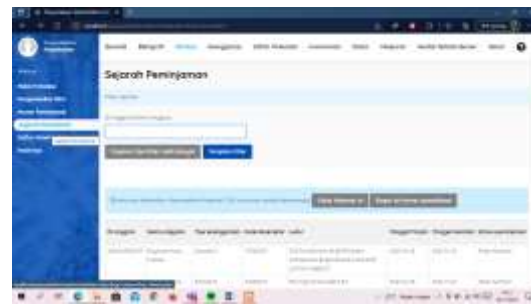


Figure 21: Sub-menu of loan history on Slims

The submenu of borrowing history is shown in Figure 21. This submenu is used to view all library members borrowing records. In addition, there is a member id search feature in this sub-menu that allows librarians to search for borrowing histories from members more easily.

5. Late List

Members who have borrowed but have over their loan limit can be found in the delay list sub-menu. You can also view the total fines received by members in this sub-menu.

6. Reservations

The reservation submenu is used to see who has ordered books online from the library. Reservation can make the librarian's job of compiling a list of borrowers much easier.

3.2.4 Membership

The membership menu is used to view data from library members, add members, and print membership cards. The membership menu is divided into two parts: the membership section and the equipment section.

1. Membership Section

View the list of members, add members, and type of membership are the three submenus in the membership section. This section focuses on the library's existing member data. The list of members and the ability to add members can be found in the submenu, as shown below.



Figure 22: Sub-menu see the list of members and add members to the Slims

Figure 22 shows the submenu to see the list of members and make changes to the data previously input. Then there is the add member sub-menu, which adds new members by filling in the member data obtained into the add member sub-menu.

2. Equipment Section

There are three submenus in the equipment section: printing member cards, exporting member data and importing member data. This section focuses on printing, compilation, and data input in a more efficient manner. Member printing can be done in one of two ways in the submenu: first, by selecting members who want to print membership cards. After that, add people to the queue. The membership card is then published as the final step. The membership card for the Electrical Engineering Slims is shown below. Figure 23 shows the example of membership cards in Slims.



Figure 23: Example of Membership Card in Slims

In addition, there are export and import sub-menus of member data in the equipment section. This sub-menu is used to enter member data or quickly print a member list in the form of a . CSV file.

3.2.5 Controlled List

The controlled list menu is employed to offer codes for books in the library. Controlled lists can make it easier for librarians to organize books and for members to find the text of their needs. There are two sections to the controlled list menu: the controlled list and the reference list. Figure 24 shows the example of the controlled list section, and Figure 25 shows the reference list section.

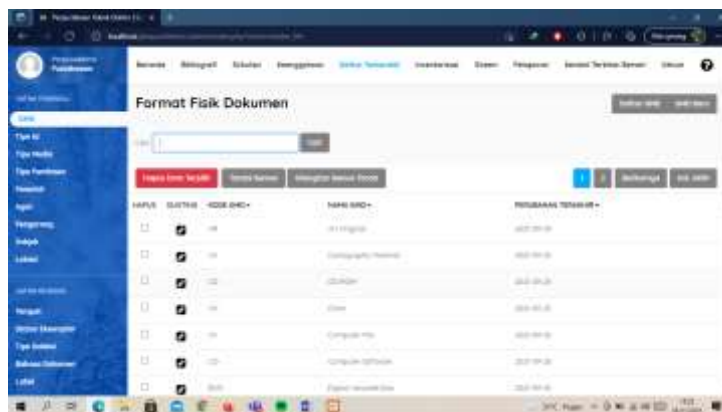


Figure 24: Example of controlled list section display on Slims

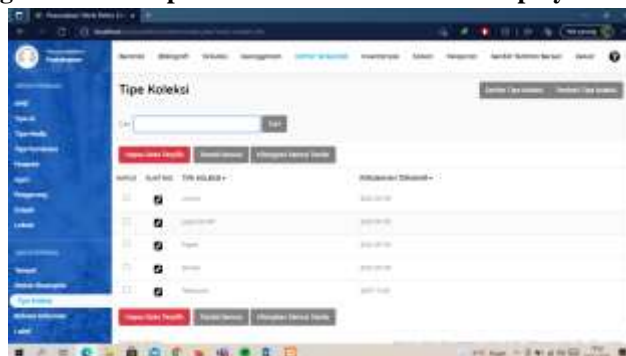


Figure 25: Sample display of the reference list section on Slims

3.2.6 Inventory

The inventory menu is used to recap the loan data in HTML form. There are two sub-menus in this menu: inventory recording and initialization. Figure 26 shows the inventory searching sub-menu, and Figure 27 shows the inventory process sub-menu.



Figure 26: Inventory search sub-menu on Electrical Engineering Slims



Figure 27: Inventory process sub-menu on Electrical Engineering Slims

3.2.7 System

Electrical Engineering Library Information System based on Slims appearance and information can be customized using the system menu. System settings, system environment, UCS settings, themes, plugins, additional fields, content, Biblio index, modules, user groups, librarians & system users, shortcut settings, holiday settings, barcode generator, notes system, and a copy of the database are all found under the system menu. Figure 28 shows the example of a sub-menu display on the system menu.



Figure 28: An example of a sub-menu display on the system menu

3.2.8 Report

Print daily, monthly, and yearly reports and the whole Electrical Engineering Slims data using the reporting menu. Information can be printed in either graphic or tabular format. There are two sections in the reporting menu: the report sheet and other reports. The report sheet has three sub-menus: collection statistics, loan reports, and member reports. There are many sections in reporting, such as recapitulation, list of titles, list of exemplar titles, statistics on collection usage, lending based on classification, list of members, list of borrowing members, and loan history as the general report. There is also a due warning report, list of delays, staff activities, visitor statistics, visitor statistics per day, visitor list, fine report, fine member list, gain information, and download counter. Figure 29 is an example of a resources list.

Perpustakaan Teknik Elektro - Laporan Statistik Koleksi	
Wegkeren Statistik Koleksi	
Jumlah Koleksi	10208 (termasuk judul yang belum memiliki data exemplar)
Jumlah Koleksi dengan exemplar	10700 (termasuk judul yang memiliki exemplar)
Manusula/Data Koleksi	10700
Exemplar Digilang Koleksi	0
Exemplar Koleksi Dalam Koleksi	10700
Total Judul Menurut Media/GMD	Chart (1962), Art Original (295), Text (0)
Total Exemplar Menurut Jenis Koleksi	Textbook (7238), Skripsi (2558), Paper (480), Lemal (0)
TD Judul "Keangulan"	1. Remyngman Dillah E.B 2. 300 BANGSAAN ELECTRONIKA : KARYAKARYA ELECTRONIKA PASWITE LINTAS PLSBYET

Figure 29: One example of a sub-menu report on Slims

3.3 Slims Main Menu Adjustment and Old Library Information System

This stage involves adapting Slims 9 Bulian's features to the old Electrical Engineering library information system. Slims 9 Bulian has a variety of appearances and uses, which might make it easier for library patrons to find a book. The PHP programming language is used to make changes to the website. The following are the changes made to Slims and the old information system.

3.3.1 Advanced Search

Advanced search is utilized on the Slims main menu to look for books. Advance search optimized for the old library, including title, ISBN/ISSN, year of publication, publisher, author, subject, and collection type. Adjusting Advanced Search involves numerous steps, which are outlined below.

- a. Add code to the advsearch.php file as shown below.

```
<div class="col-sm-6">
  <div class="control-group">
    <label class="label"><?php echo __('Tahun Masuk Buku'); ?></label>
    <div class="controls">
      <input type="text" name="publish_year" class="form-control" />
    </div>
  </div>
</div>
```

Figure 30: Code to add an advanced search feature to Slims

The code in Figure 30 is used to display the search for the year of book-entry in the advanced search. The label class is inserted with the label 'Year of Book Entry' in the code above, and the data is collected from the publish year query in the Biblio table.

- b. Added the following code to the default.inc class file.

```
if ($keywords && !preg_match('@[a-z0-9_]+=[^=]+(s+@i)', $keywords.' ')) {
  $criteria = 'title='.$keywords.' OR author='.$keywords.' OR subject='.$keywords.' OR publish_year='.$keywords;
  $biblio_list->setSQLcriteria($criteria);
}
```

Figure 31: Add code 'OR publish_year' .\$keywords in criteria

The code in Figure 31 is used for the query filtering process in the advanced search. In the code above, it can be seen that the "criteria" function is used to filter the data as desired. The above program filters data on 'title', 'author', 'subject', and 'publish_year'.

```
$publish_year= '';
if (isset($_GET['publish_year'])) {
  $publish_year = trim(strip_tags(urldecode($_GET['publish_year'])));
}
```

Figure 32: Added "isset" function to advanced search

The code in Figure 32 is used to check whether a variable exists or not in a table. The function will return false if the test variable contains a NULL value.

```
if ($publish_year) { $criteria .= ' publish_year="'.$publish_year.'" ; }
```

Figure 33: Added if statement in custom search

The code in Figure 33 is used to modify the search criteria in the advanced search. If the search is focused on the 'publish_year' search, the data search will be filtered on the 'publish_year'.

```
if ($publish_year) { $search_result_info .= __('Tahun Masuk Buku').' : <strong><cite>'. $publish_year.
  '</cite></strong>,' ; }
```

Figure 34: Code to display the search results for the year entered in the book

The code in Figure 34 is used to display the results of an advanced search. If the search is centered on 'publish_year', the year of entry for the book being searched will be displayed.

3.3.2 Information Detail

A display on Slims that provides information on the books in the library is called detailed information. The title of the series, calling number, publisher, physical description, language, ISBN/ISSN, classification, content type, medium type, subject edition carrier type, specific detailed info, and declaration of duty are currently included in the detailed information. Figure 35 is the additional code to the file 'detail_template.php' file to provide further information.

```
<tr>
  <td><?php echo _("NIM PARALELSMA"); ?></td>
  <td>
    <div itemprop="nim_1" property="nim_1"><?php echo ($nim_1) ? $nim_1 : '-'; ?></div>
  </td>
</tr>
```

Figure 35: Code to add detailed information

3.3.3 Biblio_custom

Biblio custom is a program that allows you to add data to a book. Origin, Location, Inventory, Abstract, Class number, Copy, Semester, Keywords, Subject, City publisher, NIM1, NIM2, Email, Tutoring1, Tutoring2, and Status were all added to Biblio custom to match data with the former library. In the file 'custom field.inc.php,' information data was added using PHP. Here's an example of a code that may be used to add data to a book. Figure 36 shows the code to add book information detail in Slims.

```
'customfield1' => array(
  'dbfield' => 'asal', // name of field in 'biblio_custom' table in database, make sure you already define it
  'label' => _("Asal"), // label of field in form
  'type' => 'text', // type of field
  'default' => '', // default value of field
  'max' => '50', // maximum character to enter in 'text' field type
  'data' => false, // an array of data for 'dropdown', 'checkboxlist' or 'choice'
  'indexed' => true, // NOT APPLICABLE YET, FOR FUTURE RELEASE USE
  'width' => 50), // width of field in form for 'text' field type, maximum is 100
```

Figure 36: Code to add book information data to the Slims library

3.3.4 Member_custom

Member custom is a library application that adds member information data. Additional data is added to member customs, including parent's names, phone numbers, addresses, status, appearance, notes, and guardian lecturers. There is a modification in 'member_custom_field.inc.php' file. Figure 37 shows the transformation done in that file.

```
'customfield2' => array(
  'dbfield' => 'orangtua', // name of field in 'member_custom' table in database, make sure you already define it
  'label' => _("Nama Orang tua"), // label of field in form
  'type' => 'text', // type of field
  'default' => '', // default value of field
  'max' => '50', // maximum character to enter in 'text' field type
  'data' => false, // an array of data for 'dropdown', 'checkboxlist' or 'choice'
  'indexed' => true, // NOT APPLICABLE YET, FOR FUTURE RELEASE USE
  'width' => 50), // width of field in form for 'text' field type, maximum is 100
```

Figure 37: Code to add member information data to the Slims library

3.3.5 Book Label and Barcode Adjustment

Books are marked with labels and barcodes to help distinguish them in the library. Slims now has label and barcode printing capabilities. Slims labels and barcodes, on the other hand, do not match the Electrical Engineering library labels and barcodes. There is a need for the customization of Slims labels and barcodes. Labels and barcodes can be adjusted by importing files from the prior Slims documentation.

3.4 Advantages and Disadvantages of Slims with Old Library Information System

Slims have many benefits because of the usage of a framework that has been standardized for the library. According to this research, Slims has the following advantages over the old information system.

- Slims 9's appearance is more modern than the prior library information system because the framework has an updated version and maintenance. The Slims feature will make it easier for the librarian to understand the information system functionality.
- Slims library members can more quickly order or check the availability of books.
- Slims's specific searches are becoming increasingly detailed.
- Bookkeeping and data collection are more straightforward.

In addition to the benefits of Slims, there are certain drawbacks to using Slims over the old information system, as listed below.

- Slims are more difficult to adapt when it comes to changing the display or personalizing features because they are developed by the national library, making it challenging to identify where the code that needs to modify takes place and impacts another source code.
- Programmers rarely use slim. This situation could explain why there is no documentation about Slims.

4. CONCLUSION

The following are some of the outcomes of research at the Department of Electrical Engineering Diponegoro University Library:

1. Installing, tweaking ODBC, inserting database, and mapping data are the four stages of data mapping.
2. Data mapping is more straightforward to utilize than manually entering data. Data mapping makes the functionality of modifying data based on the characteristic become easier.
3. Other elements in the admin menu can be used to make it easier for librarians to obtain and collect data.
4. The procedure of altering the information system features is conducted by utilizing the PHP programming language by adjusting Slims programs.
5. Advanced search, label and barcode, member custom, Biblio custom, and comprehensive information are all features that have been adapted to the old library.
6. Changing the display or personalizing features on Slims is more difficult because Slims are manufactured by the national library, making it difficult to determine where the code you wish to update is situated.

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