

Website library information system design using fast method

A Gunawan^{1*}, N Wahyuni¹, H Setiawan¹, PB Katili¹, R Azla¹

¹Department of Industrial Engineering, Universitas Sultan Ageng Tirtayasa,
Jend. Sudirman Km. 3 Cilegon, Banten 42435, Indonesia

*E-mail: a68ar@untirta.ac.id

Abstract. This research was conducted at the Department of Industrial Engineering as part of the department at Sultan Ageng Tirtayasa University which has applied information technology to support every academic activity, information media, and services. Likewise the library which is part of the academic facilities in industrial engineering matters. However, in the current condition the library does not have an information system as a form of service improvement and information technology utilization. In service activities and the availability of information in the library it was found that industrial engineering students have not provided information system support, specifically regarding search reference books, and research. A general search for references for this book is handled by the industrial engineering library. Based on this problem, therefore an information system based website will be designed using a CMS (Content Management System) because it can meet the management system, management information system, and present information to users. The information system in this study was designed using the FAST (Framework for Application of System Technique) method in which there is an analysis using PIECES (Performance, Information, Economic, Control, Efficiency and Service) therein. This method provides a model for analyzing and defining user needs, choosing solutions and making an organized system for designing information systems.

1. Introduction

The need for information systems to support organizational processes and service systems is something that is needed to reach more users. The rapid development of technology, especially in the field of information technology and access to the Internet provides the right opportunity to develop better information services for each organization. The principles of information systems in an organization are the use of information systems that aim to add value to organizations that are strongly influenced by organizational structure, culture, needs, change and development.

The role of information systems in all aspects is very relevant to the era of the industrial revolution 4.0 which began to penetrate in Indonesia, especially with the presence of various platforms that provide convenience services for information, services will buy products or even in the academic field. In addition, the linkage of this system with the internet as a bridge of access to information also paves the way for any community that has a smartphone or laptop to find everything on the internet. The following are the



objectives of the research, which are as follows: To find out the design of web-based information systems in the untirta industrial engineering library. Evaluation results from web-based information system design tests in the untirta industrial engineering library. Comparison of previous systems with information systems that have been designed.

2. Method

The design of library information systems in Untirta Industrial Engineering is based on the need for library-based service web sites to facilitate library data management, as well as access for users. In the current condition, library information systems do not yet exist in the industrial engineering department, so information system design is needed. The design of this information system uses open source media in the form of an open source Content Management System (CMS) wordpress with a local XAMPP server, using the PHP programming language, CSS and using a MySQL database. This design uses primary data in the form of interviews with Library Supervisors and Library Managers about what is needed to support a web-based library information system. There is also secondary data in the form of administrator account creation data, member data, book data, practical work report data, final project data in the Untirta Industrial Engineering Department. The following is the compilation process carried out in this study, there are 2 flow basins namely general research flow diagrams and data processing flow diagrams. (See Figure 1)

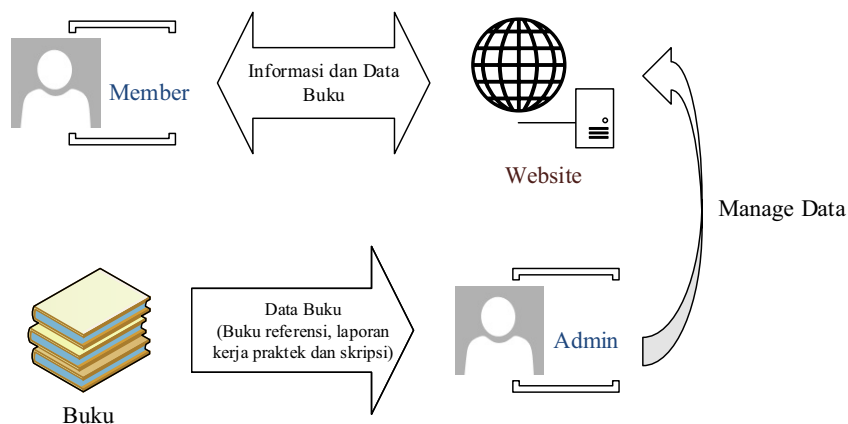


Figure 1. Process flow

Process Flow is a fundamental representation of a process that schematically describes the flow of data in the system. In this library information system, process flow provides a schematic picture between members, books, data flowing in the process and the admin. The following is a process flow from the library information system.

3. Result and Discussion

Data collected in this study are primary data and secondary data, where primary data is data that is taken directly and secondary data is data that is taken indirectly. Primary data collected were in the form of field observations, interviews with PIECES tools and brainstorming with the Untirta Industrial Engineering Library Board. In addition, the usability questionnaire was distributed to the Head of the Library, Library Management and Users of the Library System. Secondary data collected in this study is in the form of library information data, administrator accounts library members, books (reference books, practical work reports and thesis).

Processing library information systems requires administrator account data, library members, books, practical work reports and theses to support library information systems. Data is taken based on data that is already in the library of industrial engineering in the library management period 2019/2020.

In solving the problems of the library system berbasis web at the Department of Industrial Engineering Untirta used FAST method which consists of several phases including, definition of scope (Scope Definition), Problem Analysis (Problem Analysis), Needs Analysis (Requirement Analysis), Design Logical (Logical Design), Physical Design (Physical Design), Construction and Testing (Construction and Testing). Definition of scope is the initial identification phase in designing a system. In this phase the defined scope of a system library that will be in the making. The following is the scope contained in this design, as follows: The project name Website-Based Library Information System Design in Untirta Industrial Engineering Department. Software OpenSource CMS (Content Management System) Framework, Google Chrome Browser, PHP, HTML, CSS programming language, using a MySQL database, with local servers XAMPP (X, Apache, MySQL, PHP and Perl). Scope, There are several processes in the scope of the library including: Administrator and Member Login Processes, Process See Home, Profile, Book Data, Job Training Report Data and Thesis Data, Process of Input and Editing Homepage, Profile, Data Book, Data Job Training Report and Thesis Data, The Process of Adding Administrators and Members, The Process of Editing and Deleting Administrators and Members

This problem analysis phase is used to analyze problems that occur in the scope of research. In this research, PIECES tools are used. In analyzing the problem using the PIECES framework in this study five categories of PIECES are classified: performance, information, economics, control, efficiency, service. The following PIECES framework is used to define the problem:

Table 1. Defining the problem using the PIECES framework

PIECES	Defining the Problem
Performance	The data collection of books, practical work reports and thesis requires time, energy and data storage space
Information	Information on the results of data collection is stored quite a lot and is not absorbed well by the user
Economy	The use of paper is conventional and costs money
Control	The risk of loss of notebooks or data not stored on the system and lack of supervision from the responsible library
Efficiency	Data capture requires a long time and only one data collection path
Service	Data collection or recording of books, practical work reports, and theses are inflexible and unresponsive

The table defines the problems that occur in the existing system by classifying five categories of PIECES, namely performance, information, economics, control, efficiency, service. So that needs can be determined in accordance with the state of the system in order to achieve system design in the library information system problem.

After using the PIECES tools, a system translation is done by analyzing the old system (conventional) with the design of the information system under study, as follows:

Table 2. Analysis of the old system (conventional) with the design of information systems

Comparison	Conventional	Information Based System
Access	In the old system, members had to come directly to the library and search for the title of the book with the desired keywords manually	In this system, members only need to open the website and access information through the website on the condition of a login first

Efficiency	In the old system, the capacity of the room contained in the library did not allow all students to come and look for books whether available or not	In this system, users can search for relevant keywords related to the book sought and the system quickly provides book information
Promotion	In the old system, the library only had social media accounts for information facilities and relied on direct presence in the library to promote books and information	In this system, the library will be able to use social media accounts and for complete information facilities can rely on the website without the need for direct presence in the library for registration, filling out forms and promoting books and information

Based on the analysis of the problem that has been explained, then the system requirements are determined to form a library information system that can answer the problem. The following are some of the requirements for a library information system to be built including: Facilities for collecting data on books, practical work reports, and a thesis. Displaying book data, practical work reports, and theses to the admin and members in accordance with the access rights. There is a data search function in accordance with key data information both books, practical work reports, and thesis.

In needs analysis, there are 2 categories of needs, namely functional and non-functional needs. Functional requirements cover the function or service aspects that the system must provide, while non-functional features are additions (not including service functions) to support system utilities.

In the phase of functional and non-functional requirements, it aims to provide an overview of the system to be made. This stage is a step to model the library information system that needs to be designed. At this stage there are tools namely Process Flow, Context Diagrams, and Data Flow Diagrams (DFD) and Entity Relationship Diagrams (ERD). This tool is used to determine the data flow used in information systems starting from giving an overview of system processes, and overall system data flow. Entity Relationship Diagram (ERD) is used to determine the relationships between entities that exist in the system. There is also a Context Diagram which is also referred to as DFD Level 0 in this system. There are 2 entities involved, namely Admin as the head of the library or management and Members as library members. Below is the context diagram of the library information system. (Figure 2).

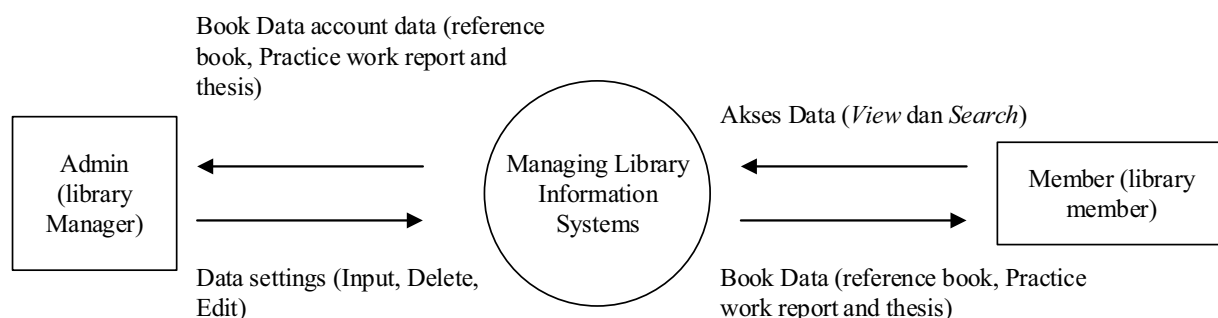
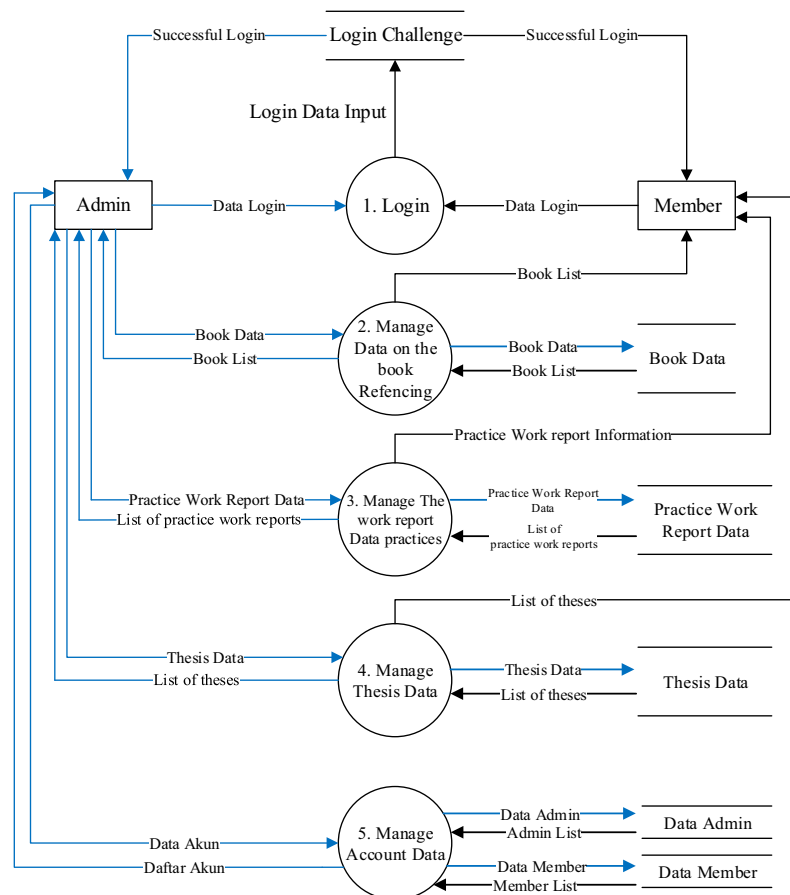


Figure 2. Context diagram (DFD Level 0)

Data Flow Diagrams (DFD) is a tool used to describe the flow of data that is in the system and a process carried out by the system. The following is DFD level 1 of the library information system:



Information :

— : Admin
 — : Member

Figure 3. DFD level 1

DFD level 1 above shows how the flow of admin and member libraries have a role in the system. The flow of data from each account can be seen according to information, where the admin can be seen through the color of blue arrows and members can be seen through the color of black arrows.

After DFD level 1, the next step is DFD level 2 of library information system design. DFD level 2 aims to provide a more in-depth picture of the system. The main process on the system will be broken down into subsystems. The following is DFD level 2 of library information system design.

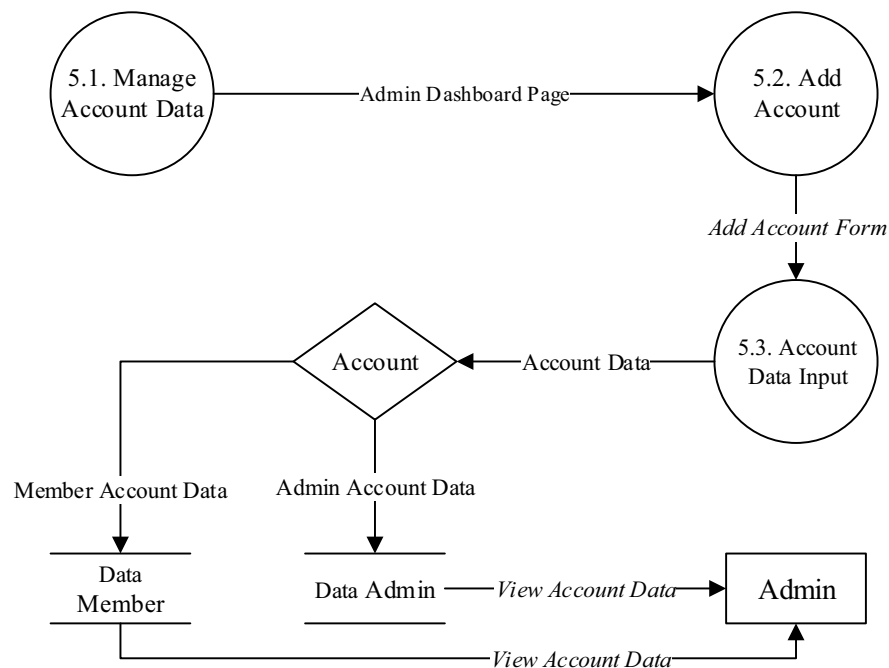


Figure 4. DFD level 2 thesis manage process

1. Process : 5 .1
 Process Name : Manage Account Data
 Enter : Account Menu
 Output : Open the Manage Data Account Page
 Process Summary:
 Admin chooses to manage account data then the manage account data page will open.
2. Process : 5 .2
 Process Name : Add Account
 Enter : Open the Add Account Form
 Output : Add Account Form
 Process Summary:
 After the Add Account Form opens, the admin can enter account data by filling out the available forms.
3. Process : 5 .3
 Process Name : Account Data Input
 Enter : Add Account Form
 Output : Account Data
 Process Summary:
 Account Add Form that has been filled according to the type of account that is admin or member. then click ok so that the account data is successfully input into the system.

Entity Relationship Diagram (ERD) is used to determine the relationships between entities that exist in the system. The following is the ERD of library information system design.

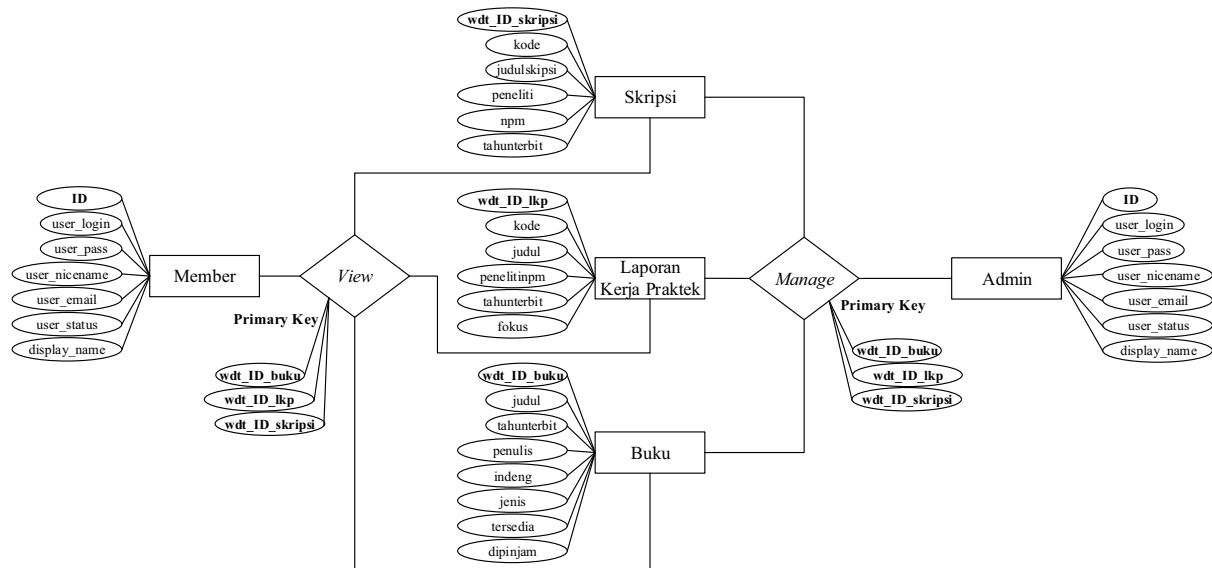


Figure 5. Entity relationship diagram

The following is the display of the home page in the library information system in the Untirta Industrial Engineering Department.



Figure 6. Home page display

On the home page there is information about the library information system, several menu items and there is a login column. The following is a profile page display on the library information system in the Untirta Industrial Engineering Department. On the profile page there is information about the untirta industrial engineering library, several menu items and a login column. The following is a display of book pages on the library information system in the Department of Industrial Engineering, Untirta. On the pages of the book there is information about the reference book data owned by the industrial engineering library. There are two roles namely admin and member. The role member only has access rights to information while the role admin can manage items, namely adding book items, editing book items, and deleting books. The following is a page display of practical work reports on the library information system in the Untirta Industrial Engineering Department. On the practical work report page, there is information

about the practical work report data that is owned by the industrial engineering library. There are two roles namely admin and member. The role member only has access rights to information, while the role admin can do item management, namely the addition of practical work report books, edit work practice report items, and delete practical work report books.

The following is a dashboard page view on the library information system in the Untirta Industrial Engineering Department.

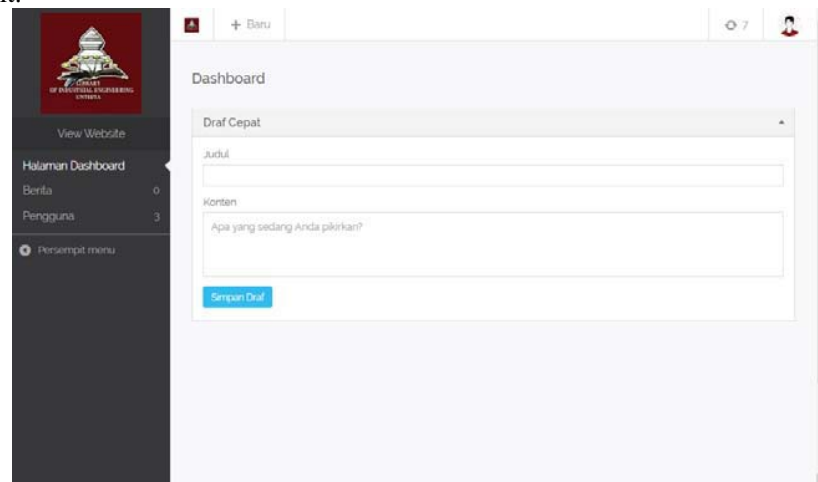


Figure 7. Dashboard page views

On the dashboard page there is information and a dashboard page menu. There are two roles namely admin and member. The role member only has access to the dashboard page and user profile while the role admin has access to the dashboard page, admin profile and account management in the form of adding accounts, editing accounts, and deleting accounts.

4. Conclusion

Based on the research done, it can be concluded with the website of the library information system makes it easier for users of libraries in the process of obtaining book information, practice work reports, and thesis and members can find out what books are available in the library, facilitate the admin or the concierge Officer in managing the library data provide the ease of service process for its users.

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