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Article

Implementation of The Framework for The Application of System Thinking for School Financial Information Systems

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A B S T R A C T

The library in SMK Negeri Sukoharjo is a library that has several collections of books according to library standards and has adequate library facilities and infrastructure. Students are required to become members of the school library to support the learning process. The process of borrowing and returning books is still conventional is all records of loan administration and book return are still written manually, and when looking for the required data must look at the data recording of loan administration and book return. Library administration information system applications using FAST (Framework for the Application of Systems Technique) focuses on users to better understand and easily use applications that have been created and designed because users are seen directly in the stages carried out. The design results that have been created will be validated by the user and can proceed to the implementation stage. The results of application testing that has been made have been tested using black box testing methods that have 100% results with excellent criteria, as well as web quality testing of 71.5% with good criteria.

INTRODUCTION

Vocational High School Libraries that already have library management staff have several book collections according to library standards and have adequate furniture and equipment. Students are required to become members of the school library. However, the service process that is still conventional, namely all the data collection is still recorded in the book of borrowing, when looking for the data that needed to be seen in the book of borrowing, this leads to the search data is slow, the services or the manufacture of the report. In addition, officers also difficult to know the availability of the book and look for students who have not returned the books on time.

FAST is a system development method for building and testing a system that meets the requirements of learning[1], implementing an interface between a new system and an existing system.

To fulfill good and efficient service to its members, libraries need an information system that can assist members in finding information or references about the required book data. A library also needs a system to collect data, process data, store data, review data, and distribute good information, one of which is having high data accuracy. To meet these needs, the effort that must be done by the library is the use of information technology such as computers and information system applications[2]. This is expected to help librarians in data processing and report compilers quickly and accurately[3].

I. LITERATURES REVIEW

FAST means compiling a new system to replace the old system as a whole or improve the existing system. FAST is a system development method for building and testing a system that meets the requirements of learning, implementing the interface between the new system and the existing system[4]. FAST is a framework that is quite flexible for various types of projects and strategies, this method is also called the agile method because of its ability to support not only good application development but also support other techniques including structured systems analysis, engineering information, and object-oriented analysis and design[5].

Blackbox testing is a test that is carried out only by observing the results of execution through test data and checking the functionality of the software[6]. Blackbox testing is a test of the function of the application that will be used so that all functions of the system run properly and accordingly.This test does not see and test the source code of the program. Blackbox Testing works by ignoring the control structure so that its attention is only focused on domain information[7].

Web Quality 4.0 is a method of measuring website quality based on end-user perceptions. This method is a development of service quality which was widely used before in measuring service quality[8]. Web Quality 4.0 is related to website design such as appearance, user convenience, navigation, and the appearance presented on the website. Web Quality 4.0 focuses on the view of how users view and interact with websites. Web Quality 4.0 is the result of analysis on Web Quality 3.0 which leads to the identification of the following three dimensions:

1. Usability relates to the design of the site, for example, appearance, ease of use, navigation, and the image presented to the user. There are three general components of usability, namely the involvement of a user, the user doing a job, and the user doing something with a product, system, or thing.
2. Information Quality is the quality of the content contained on the site. Whether or not the information on the site is appropriate for user purposes such as accuracy, format, and relevance
3. Service Interaction Quality is the quality of the service interaction experienced by the users when they build into the site is in, which manifested itself with confidence and empathy.
4. Use Satisfaction is a service that measure user satisfaction in that aspect thorough when they learn more in a site that has been created.

II. FRAMEWORK

The Research framework is the flow from a concept of research that systematically

arranged so that the research can be run better

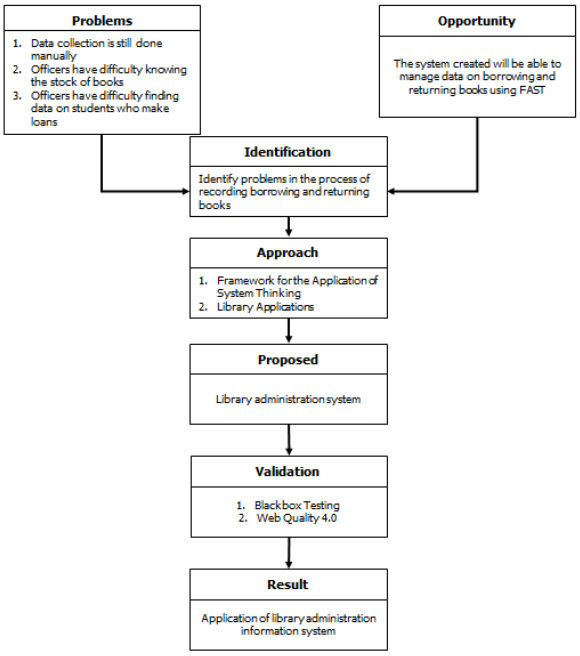

Figure 1. Research Framework

1. The problems found in Sukoharjo State Vocational School are that data collection is still done conventionally, officers have difficulty knowing the stock of books, looking for student data who have not returned books, and searching for data takes longer because they must search in student loan books.
2. The Opportunity is to conduct observations of the system that is run following the application to be built. Based on a plan that will be conducted will be made of the application of system thinking to the information systems library.
3. The approach in this research is the method used to implement the system that will be used in research. application of a book storage system, book borrowing, book return at SMK Negeri Sukoharjo, which will be built based on an application using the FAST method.
4. Proposedin the construction of this system is to design and create applications system administration library for SMK Negeri Sukoharjo, with the new system this can help the School SMK Negeri Sukoharjo in the administration of the library which includes the storage of books, borrowing books, returning books in the library.
5. Validation is done with the use of model testing and black box testing to be tested to the expert software engineering and web quality 4.0 based on the dimensions of quality, usability, information quality, interaction quality, and user satisfaction that will be done to the user system
6. The Result of this research is the application of the library system by the method of FAST to SMK Negeri Sukoharjo, which will be managed by admin that will produce data and reports of students who borrow books and return books.

III. METHODS

The research method is the steps that are performed in this research, the following are the stages done

1. Scope Definition in the administration information systems library will be created information system that can manage data books, data members, borrowing and repayment data up to the report.
2. Requirements Analysis to identify the functional requirements of the program accompanied by a depiction of the use case associated with the adoption of the framework of the application of systems thinking to information systems library.
3. The Logical Design is illustrated through case diagrams, activity diagrams, and class diagrams.
4. Decision Analysis will be implemented in the manufacturing system application library as a solution to the problems and needs that have been defined on stages

before. Appropriate consideration will be implemented

5. Physical Design will be a guide to the design of the system be created. The design Interface that created the draft interface login page, the home page, page, student data, the data page of the book, the page of borrowing, the page returns, and the design interface of the report page.
6. Construction and Testing in this research will build and test the database, application programs, and the design of the interface (interface) by using the method of black box and web quality 4.0 as the testing of systems thinking to information systems library SMK Negeri Sukoharjo.
7. Installation and Delivery in this research, a system that has been built to be operated. The stage of installation and delivery of the role is to send the system into operation, involves training the people who will use the system finally and develop documentation to help users of the system

IV. RESULT

System implementation is a process to match the new information system into the existing system[9]. The implementation of this prototype will explain the results of the research and manufacture of the prototype, so knowing whether the prototype has been made to achieve the desired goal. Use case diagram on the application of the framework of the application of systems thinking to information systems library SMK Negeri Sukoharjo.

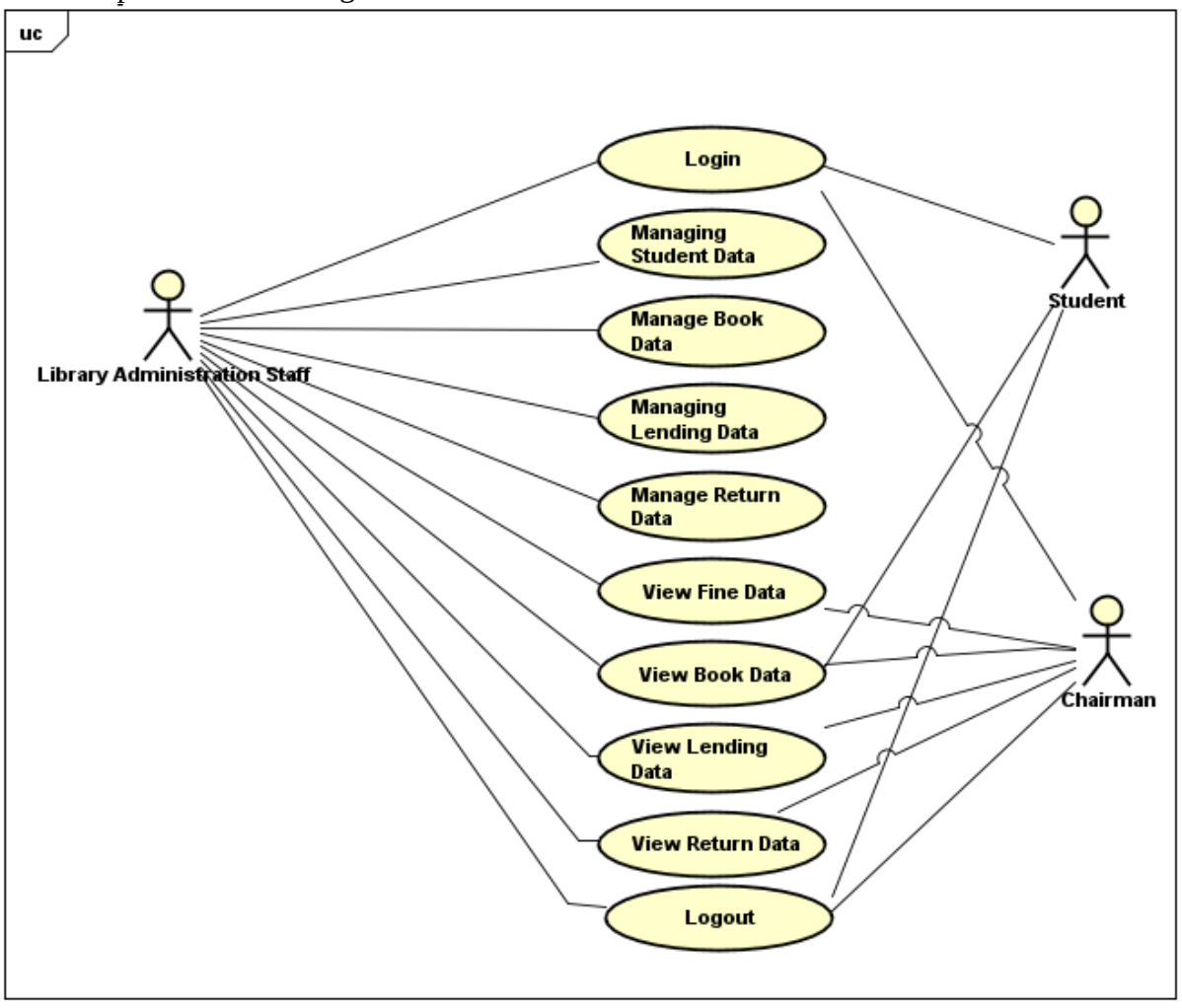

Figure 2. Use Case Diagram

Class diagram on the application of the framework the application of system thinking to information systems library can be seen in the following Image

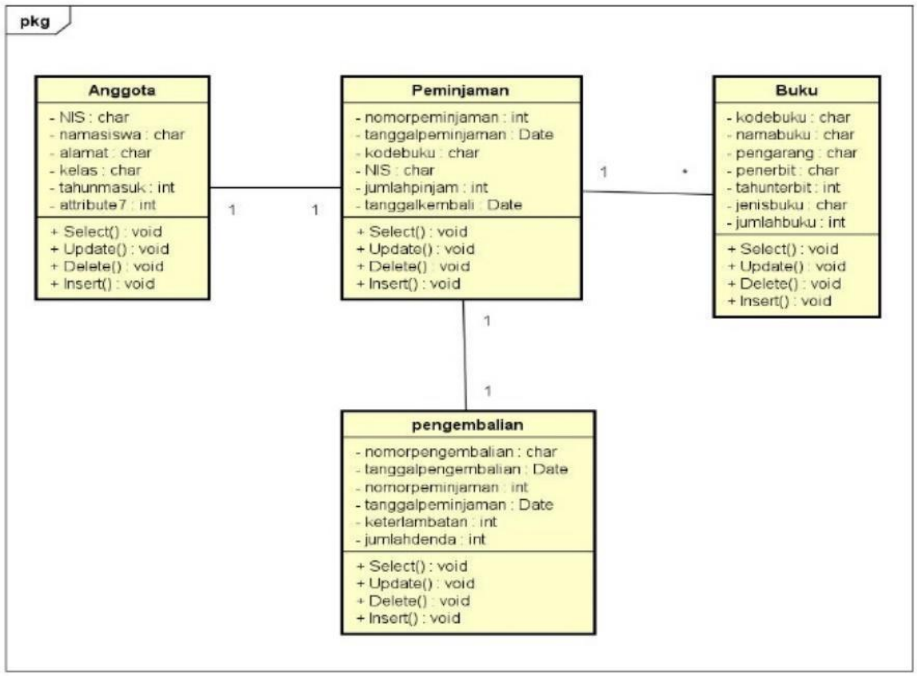

Figure 3. Class Diagram

The system has the login menu to the admin library, leaders, and students that requires entering your username and password to enter the initial page of the system.

Figure 4. Login Page Implementation

The dashboard page or a start page in this system provide information and data regarding the amount of data of students who visit the library this month and the number of library books

Figure 5. Dashboard Page Implementation

Page borrowing data contains information about all the members of the library to borrow a book. On this page, the library staff can add, change, and print the data of borrowing books.

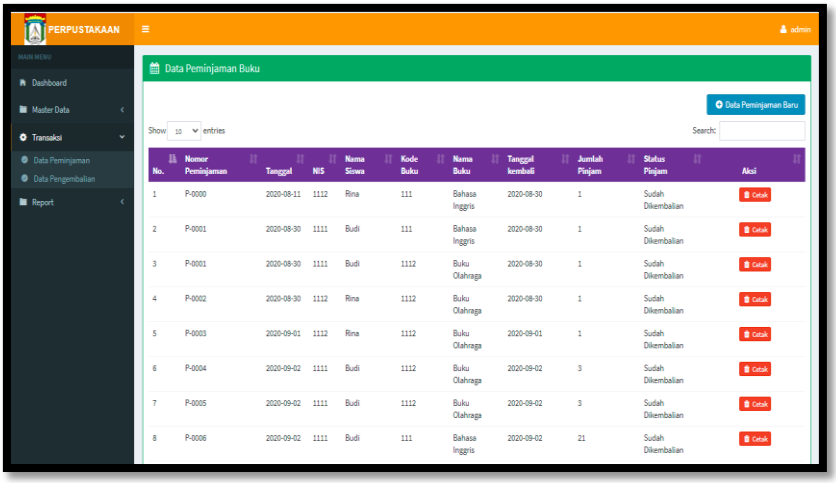

Figure 6. Borrowing Books Page Implementation

Page of the return data contains information about all the members of the library who have done the return of the book. On this page librarians can add, change, and print the return Databook.

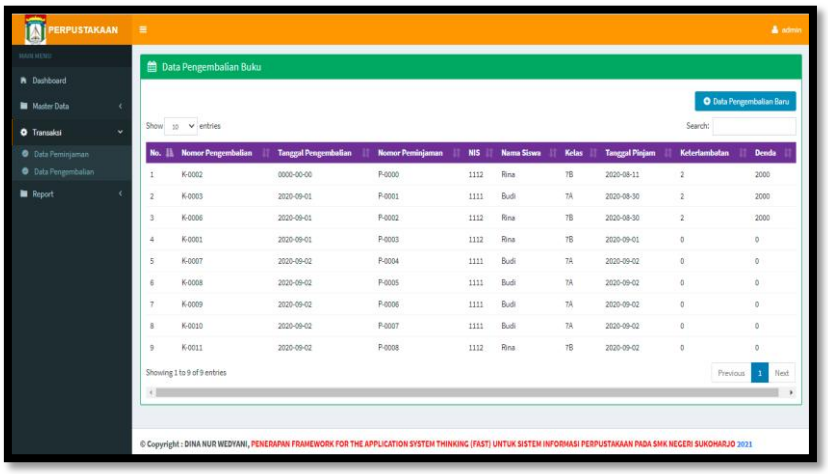

Figure 7. Return Books Page Implementation

Results black box testing to determine the suitability of the functions on the information system of the school library that is created[10], [11]. Here are the results from the test black box that can be seen in the results of the recapitulation conducted showed the number of answers of the respondents that have a value of 100% by the testing of the system using black-box testing.

Table 1. Results of Black Box Testing

Testing Criteria	Answer	
	Yes	No
Login Page	1	0
Page Data Members	1	0
Page Add Data Members	1	0
Page Change Data Members	1	0
The Data Page of The Book	1	0
Page Data Added Books	1	0
Page Change Data Book	1	0
Page Borrowing Data	1	0
Page Data Added Complimentarily	1	0
Page Of Data to Return	1	0
Page Data Added Return	1	0
Page Reports Data Book	1	0
Page Reports Data Members	1	0
Page Reports Data for Borrowing Books	1	0
Page Reports Data Return the Book	1	0
Total	**15**	**0**

the results of the recapitulation conducted showed the number of answers of the respondents that have a value of 100%.

V. DISCUSSION

Web testing, quality 4.0 will present the results of the quality of information based on each criterion, namely Usability, Information Quality, Service Interaction Quality, Use Satisfaction [12]. Exposure website quality 4.0 is created based on the responses of 1 respondent from the library of SMK Negeri Sukoharjo must fill out the questionnaire and measured with the following formula

$$\%\ Score\ Total = \frac{Score\ Actual}{Score\ Ideal} x\ 100\ \%$$

The actual score is the answer to all respondents on the questionnaire that has been proposed. The ideal score is the highest response, or all the respondents are assumed to choose the highest response. Web testing quality 4.0 is tested to 8 people consisting of 2 people library staff and 6 students.

accordance with the testing of the system using black box testing.

The test results using the usability aspect is

Table 2. Usability Aspect

Aspect	Answer				
	SS	S	R	TS	STS
Appearance	4	2	2	0	0
User Convenience	4	4	0	0	0
Navigation	3	5	0	0	0
Information	4	2	2	0	0
Score Actual	75	52	12	0	0
			200		

$$\%Score\ Total = \frac{Score\ Actual}{Score\ Ideal} x\ 100\ \%$$

= (139/200) * 100%

= 69.5%

The results of data processing of the responses of the respondents based on the

aspect of usability, then obtained a total score of 69.7%.
The results of testing using aspects of the quality of the information is

Table 3. Information Quality Aspect

Aspect	Answer				
	SS	S	R	TS	STS
Precision	4	4	0	0	0
Accuracy	3	5	0	0	0
Format	0	8	0	0	0
C*ompleteness*	5	1	2	0	0
Score Actual	60	72	6	0	0
			200		

$$\%Score\ Total = \frac{Score\ Actual}{Score\ Ideal} x\ 100\ \%$$

=(128/200) * 100%

= 69%

The results of data processing of the responses of the respondents based on aspects of the quality of the information, it obtained a total score of 69%.

The results of testing using aspects of the interaction quality is

Table 4. Interaction Quality Aspect

Aspect	Answer				
	SS	S	R	TS	STS
Assurance	8	0	0	0	0
System Empathy	4	2	2	0	0
System Trust	4	4	0	0	0
Flexible Space	3	5	0	0	0
Score Actual	95	44	6	0	0
			200		

$$\%Score\ Total = \frac{Score\ Actual}{Score\ Ideal} x\ 100\ \%$$

=(145/200) * 100%

= 72.5%

the results of data processing of the responses of the respondents based on aspects of the quality of the service interaction then obtained a total score of 72.5%.

The results of testing using aspects of user satisfaction is

Table 5.User Satisfaction Aspect

Aspect	Answer				
	SS	S	R	TS	STS
Repeat Purchase	4	2	2	0	0
Repeat Visit	4	4	0	0	0
Score Actual	40	24	0	0	0
			80		

$$\%Score\ Total = \frac{Score\ Actual}{Score\ Ideal} x\ 100\ \%$$

=(64/80) * 100%

= 80%

The results of data processing of the responses of the respondents based on the aspect of user satisfaction then obtained a total score of 80%.
The results of testing web quality 4.0 are obtained from the questionnaires, the results of the recapitulation of testing based on the 4 criteria of the quality of the success of the design framework of the application of systems thinking to the information systems library at SMK Negeri Sukoharjo

Table 6. Web Quality Test Result

No	Aspect	Score Actual	Score Ideal
1	*Usability*	139	200
2	*Information Quality*	138	200
3	*Service Interaction Quality*	145	200
4	*Use Satisfaction*	64	80
	Total	486	680

The overall results of the testing website quality 4.0 for the success of the information system of 71.5% with the criteria that is good for the application of the framework of the application of systems thinking to information systems library at SMK Negeri Sukoharjo.
The results of the assessment questionnaire use of the application has been examined,

then have the result can increase the ease in the management system of library administration.

VI. CONCLUSION

The design of the framework application systems thinking to information systems library at SMKN Sukoharjo using the 7 stages of Scope Definition, Requirements Analysis, Logical Design, Decision Analysis, Physical Design, Construction and Testing, Installation and Delivery is following the needs of users in the library information system which can overcome the problems faced by the library of SMKN Sukoharjo. The design of the framework application systems thinking to information systems library at SMKN Sukoharjo using web-based applications created with the programming language PHP and a MySQL database so that it can overcome the problems in the data processing of borrowing and return of books in the library. The results of the recapitulation conducted showed the number of answers of the respondents that have a value of 100% following the testing of the system using black-box testing. The overall results of the testing website quality 4.0 for the success of the information system of 71.5% with the criteria that is good.

VII.ACKNOWLEDGEMENT

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BIOGRAPHY

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