



Implementation of the Brute Force Algorithm in the Design of Android-Based Thesis Catalogs

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A B S T R A C T

This research was motivated by the confusion of students looking for title references for students' final assignments due to several obstacles, one of which was the lack of information about titles that had been done on their campus. The thesis catalog used in the library of the South Tapanuli Education Institute (IPTS) still uses printed media in one document in each department so that students have to take turns reading the catalog or students can directly look for theses one by one in the thesis cabinet or shelf and the current system is not yet running. Using a database so as to allow the loss of the alumni thesis title data recap. So this is the background for the author to design a Thesis Catalog System by implementing a brute force algorithm in the process of searching for the title of the thesis. This thesis catalog system is a system that aims to facilitate the performance of library staff in inputting data, especially making it easier for students to find title references. The method that the author uses in this research is the development of R&D with the ADDIE model. In addition, the author also uses the SDLC development model while the model that the author uses in this study is the Waterfall model. The programming language used is the PHP language assisted by the MySQL database. Based on the results of the research that the author did, based on the validity test of 3 experts obtained a value of 0.80 Valid criteria, for the practicality test of 2 practitioners obtained a value of 0.889 very practical criteria and the effectiveness test of 10 students obtained a value of 0.871 very effective criteria, so that the value obtained proves that the thesis catalog system can help and is ready to use.

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1. Introduction

In the past, the development of technology was very rapid, so that it changed people's views in finding and obtaining information which was no longer limited by place, time and even distance. Information technology uses computers and software to edit, store, save, process, transmit, and secure information. Therefore, information technology has an important role in the development of libraries, especially in the service section [1]. Technology has developed rapidly in various fields, one of which is in the field of libraries. Its progress can be seen from the library which is inseparable from information technology [2].

Library is an institution that provides various information, which aims to develop knowledge for students, lecturers, researchers and others [3] as well as provide services to users. Libraries are required to provide up to date information. In the process of searching the catalog, string matching is part of the string search process. The resulting catalog data is closely related to the algorithm technique being carried out.

String Matching is an algorithm used to speed up the searching process. The string matching algorithm has been widely used, such as for the string matching process based on the data text equation, namely Brute Force. Brute force is used because this algorithm can perform string searches. The brute force algorithm is an algorithm to match the pattern with all strings between 0 and n-m to find the presence of the pattern in the text. Based on the search direction, this algorithm is grouped into algorithms that read strings from the left to the right [4].

Currently, the Faculty of Mathematics and Natural Sciences at the South Tapanuli Education Institute (IPTS) has a large number of Thesis collections. The IPTS library is a library located on the campus area of the Faculty of Mathematics and Natural Sciences education. Currently, the library has not used library management software in managing the existing collection of thesis books.

This can cause impracticality in entering thesis data and in the process of searching for thesis titles for thesis guidelines for students. For visitors and library members who want to read a thesis with a certain title, it takes a long time to find the desired title because they have to check the titles listed have been done by students before or have never been done at all. Another problem that occurs is that the number of theses that enter the library continues to grow, causing the collection of Thesis titles to become more and more difficult to manage. to the problems in the library. The programming language used is the PHP language assisted by the MySQL database. So that the existence of a computerized system can help facilitate the work of several parties including library staff, lecturers and help students find references more efficiently.

2. Method

The method that the author uses is R&D. The R&D method serves to create a product and test the effectiveness of the product [5]. The purpose of this research is to design a thesis catalog product that will be implemented in the Padang Sidempuan library unit. In this research, the writer uses the ADDIE model of R&D development method. The ADDIE model uses 5 stages of development, namely; analysis, design, development, implementation and evaluation [6].

The development model in this study uses the waterfall model SDLC. SDLC is the process of developing software with the methodology used to develop a previous software system [7]. SDLC is the system development cycle. Use SDLC to describe the stages of each stage in outline divided into five main activities, namely analysis, design, implementation, testing, and maintenance [8]. The waterfall model has several sequential stages, namely communication, planning, modeling, construction and deployment.

3. Results and Discussion

The initial stage that the author did to create a system was to do an analysis, which aimed to see the thesis catalog system at the South Tapanuli Education Institute (IPTS) Padang Sidempuan. The analysis process is carried out by observing directly the system that is running, with the analysis of the system it can be seen the problems and shortcomings in the catalog of the thesis that is running. Then improvements can be made to the new system that will be designed. The benefits of this thesis catalog system as a tool for data storage and make it easier for students to find references for students' final assignments.

The next stage the author describes the application design according to the needs of system users and to whom the application is intended. This stage is a step to design the model diagram and user interface.

The next stage is the system development step. This step follows the waterfall software development model.

In implementation, the application that has been designed will be tested on the application. Implementation is a real stage to implement the designed system. The author conducts product trials which include product validity tests, product practicality tests and further effectiveness tests. The product validity tests use the Aiken's V formula. The general assessment is valid with a value of 0.80. For the practicality test of the thesis catalog system using the Kappa moment statistical formula, the general rating is 0.889, which is a very high level of practicality, and the effectiveness test using the G-Score formula is obtained based on the effectiveness sheet. The general assessment is a value of 0.871, which is a high level of effectiveness. it can be concluded that the implementation of the brute force algorithm in designing an android-based thesis catalog is very practical and feasible to use.

Evaluation is a stage to see whether the application made is running well as expected or not. From the development of this system aims to offer products that are designed to be accepted by users of the system or system. the use of the resulting product is an android-based catalog system. In distributing the product, the author distributes application links to campus WhatsApp groups and Facebook used by students and lecturers.

4. Conclusion

Based on the description that the author has done and the results of the research that the author has previously stated regarding the design of the thesis catalog system. The author concludes that by applying the Gross Force algorithm to the catalog system, it can give the desired results. With this search application can help staff employees to provide services to library visitors properly. And perform searches in a short time and in managing alumni thesis data more effectively and efficiently valid. The android-based thesis catalog information system that was designed to get a final validation value of 0.80, a practicality value of 0.889 and an effectiveness value of 0.871 it can be concluded that the implementation of the brute force algorithm in designing an android-based thesis catalog is very practical and feasible to use.

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