



Development of a Web-Based Digital Archive Search System Using The Binary Search Algorithm

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Archives, Application, Algorithms, Binary Searching

Abstract

In several departments or faculties at various universities, the business process that is often carried out is archive management. The quality of service in each organization is one indicator of the success of a business entity or organization. In meeting these indicators, information systems or information applications are a mainstay in a business strategy. In several departments or faculties at various universities, the business process that is often carried out is archive management. Archiving activities are very important because they involve official documents and are important for every institution. Increased technological innovation has empowered institutions to monitor archives in a digital way. The purpose of this research is to create a website-based archive application using binary searching algorithms that can be used to record and store easily and safely, and be managing every archive for easier access. The system development methodology uses the waterfall method and the PHP and MySQL programming languages. This application can be used to record, store, display archives by category and can be used to display archives by category, preview archives, download archives and archive details in the Design Department of the Polytechnic Media Creative.



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1. Introduction

In several departments or faculties at various universities, the business process that is often carried out is archive management (G A F Maulani, Suryadi, Nugraha, Hamdani, & Purwanti, 2019). Archiving activities are very important because they involve official and important documents for every company (Sihotang, 2018). Improving this needs to be carried out by good management as well as improving the management of reports and quick updates (Ito et al., 2014).

The quality of service in each organization is one indicator of the success of a business entity or organization (G A F Maulani et al., 2019). In meeting these indicators, information systems or information applications are a mainstay in a business strategy (G A F Maulani et al., 2019). Supporting information technology as a support in improving service quality that results in fast, accurate and accurate access to information for management (Galih Abdul Fatah Maulani & Hamdani, 2018).

Records are a significant resource owned by an organization. There are still many organizations/agencies that routinely record their institutional activities. Advances in technological innovation have empowered companies to carefully monitor documents. Documents are also a source of data and have a significant capacity in supporting the implementation of regulations and administration of an establishment (Barthos, 2012). Every activity completed by the organization as a proposition, letter and report to carry out the exercise will be documented. The data stored in hard copies are evidence and history of the organization. As time goes by, the more complicated the functions and work of

an agency, the more the agency archive will grow. The filing process must be efficient by using technology for proper, proficient, and useful organizational administration to develop the organization further (Hasan, 2014). For digital archives, it must be in accordance with the right archiving strategy so that the integrity of data and archives will be actual (Meirinawati & Prabawati, 2015).

Archive storage in the Department of Design at Politeknik Negeri Media Kreatif is still done manually. Archives are stored in a printed version and stored in a room. The capacity of the printed version is not effective because it is very likely to be eaten by termites or damaged by moisture. Another obstacle is that searching for documents takes up most of the day due to the huge pile of records.

These archival documents are often reused in accreditation, previously being checked by the quality assurance agency and external. To achieve good, neat and accessible archival documents which are expected to achieve this goal. This application software is designed based on the website and database. This database application program intends to improve the security, speed and accuracy of storage and retrieval of archival documents. With a database application, it will speed up access to information that has been stored correctly so that it can produce good decisions. For applications based on the web which allows users to get data indefinitely.

2. Materials and Methods

Globally, the primary tiers of this studies approach are divided into 4 phase, The phase consist of the guidance stage, collect data, stage, processing data, and testing. The following is the go with the drift of the studies phase:

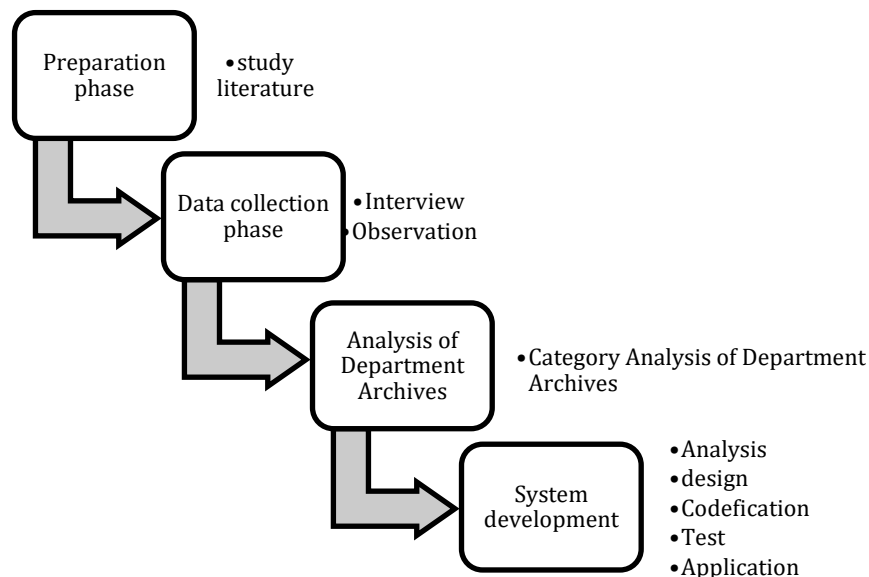


Figure. 1. Research phase flow

From the picture of the flow of the research stages above, it can be described at each stage as follows:

I. Preparation Stage

This stage starts from the problem assessment, as well as conducting a literature study related to archive management and to similar research that has been done.

II. Data Collection Stage

At the data collection stage, interviews and observations will be carried out. Interviews were conducted with the Head of the Department and the Secretary of the Department of Design, and the administrative officer of the department related to archived data in the department. As for the observations made on the use of archives and the needs of the archives.

III. Department Archive Data Analysis

In the analysis phase of the department's archives, an analysis of the department's archives includes decision letters, teaching material archives, lecturer data archives, educational and learning process archives, and departmental activity records archives. This decree archive is issued (signed) by the director of the Politeknik. This decision covers the activities of Tri Dharma, such as education, research, and service. The teaching

materials archive contains industrial practice modules and teaching materials by lecturers. The mail archive consists of the mail archive, incoming and also mail, exit as well as the required report that lists all records or a summary of the number of records by type of grouping of records.

IV. System Development

For system development using the standard SDLC (Software Development Life Cycle) method, namely using the Waterfall method or Waterfall (see Figure 2).

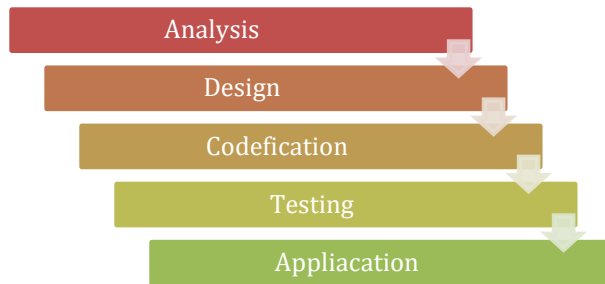


Figure. 2. Waterfall Method

3. Results and Discussions

In the system design using a usecase diagram. Usecase diagrams are used to describe a system in user view or system user. System design can be seen in the use case diagram below:

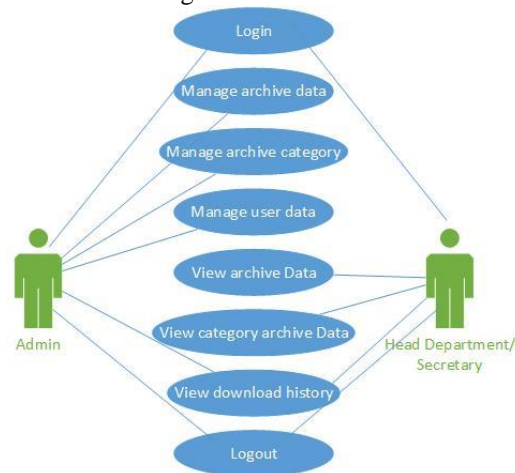
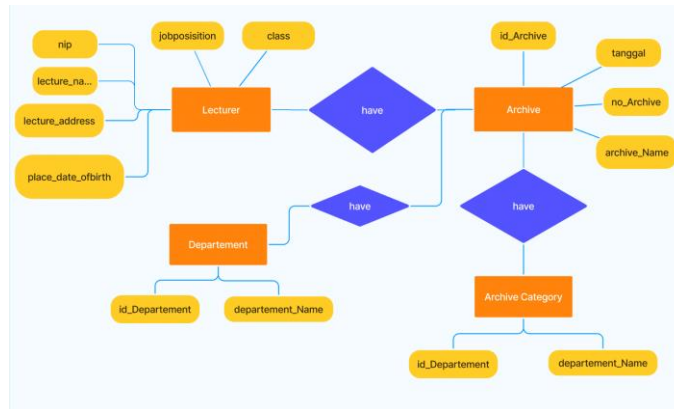


Figure. 3. Usecase Diagram

From Figure 3 above, it can be seen that admin can manage archive data, manage archive categories, manage user data, view download history, and login/logout. As for head or secretary department, can view archive data, archive category data, download history and login/logout.

To design a relational database, use the Entity Relationship Diagram (ERD). ERD archiving system as seen in Figure 4 below:



From the ERD image above, it can be seen that there are four entities, namely lecturers, departments, archives, and archive categories. The attributes of each entity include:

1. Archives: Archive_Id, Date, Archive_No, Archive_Name
2. Department: Department_Id, Department_Name
3. Archive Category: Category_Id, Archive_Category_Name
4. Lecturer: Nip, Nidn, Lecturer_Name, Lecturer_Address, Place_Date of Birth, jobposition, Class

For the design of the archive system application page view, it can be seen in the figure 5 until figure 8.

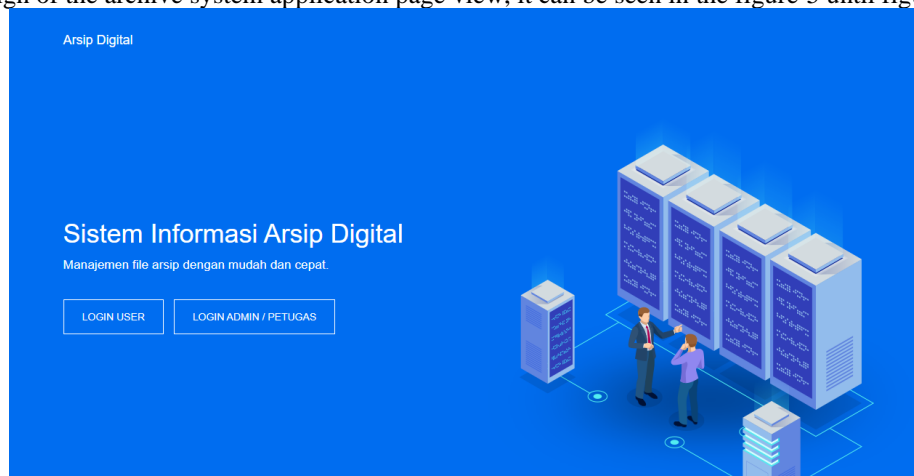


Fig. 5. Home Page View

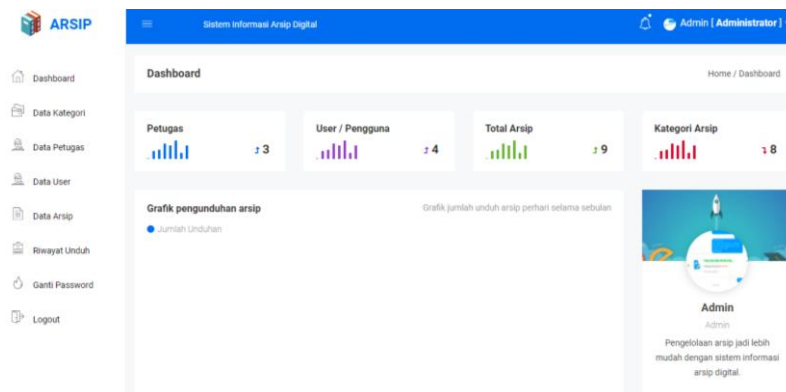


Fig. 6. Main Menu Archive Application System

No	Waktu Upload	Arsip	Kategori	Petugas	Keterangan	OPSI
1	00:31:04 03-12-2022	KODE : D Nama : R Jenis : pHp	Surat Izin Pelaksanaan	Jhony Andrian	R	Preview
2	21:22:50 02-12-2022	KODE : 00001 Nama : saUS Jenis : pHP	Tidak berkategori	saus	asdasd	Preview

Fig. 7. Archive Application System Data Archive

No	Nama	Keterangan	OPSI
1	Tidak berkategori	Semua yang tidak memiliki kategori	
2	Surat Keputusan	Format arsip untuk surat keputusan	
3	Surat Izin Pelaksanaan	Contoh format surat izin pelaksanaan pekerjaan	
4	Surat Kesehatan Pegawai	Surat kesehatan untuk pegawai	
5	Surat Lampiran Tugas Akhir	Surat contoh lampiran untuk Tugas Akhir	
6	Curriculum Vitae	Contoh format surat curriculum vitae untuk kenaikan jabatan	

Fig. 8. Archive Application System Category

Development Binary Searching Algorithm

This binary search instruction pattern can be known as dichotomic search. Starting from comparing the value to be searched, x , with the element in the middle of the array. where in the middle x has more points than the array element in the middle, so each array element is arranged to increase, then the search is carried out in the half of the time that has points greater than x until the element is finished, using a similar method. To make it easier, it is explained with a picture of the case. found a table that has int points $TabInt[1..n]$, which has been loaded, and arranged to enlarge. write a program using the help of a function that if the point x is set to an integer value, it will look for whether the price of x is in $TabInt$ dichotomically, with the following rules: the example of x with the velocity of the middle element (Imamah, Sofro, & Johan, 2017).

a. If it is similar, it means x is found in the table.

b. If $x <$, the search is carried out on the bottom element with a similar process.

c. If $x >$, the search starts at the top element in the same way. The search will produce a found boolean whose value is true if x is found, and false if x is not found as well as the index where x was found. The search stops after the initial value is found.

In creating this web-based archiving and archive search application, a binary search technique was used. For more details, see the following figure below:

The binary search process as follows using the 5 stored data files will be displayed.

A= Uncategorized

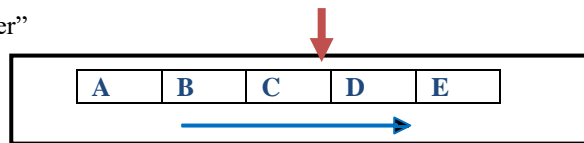
B= Implementation Permit Letter

C= Final Assignment Attachment Letter

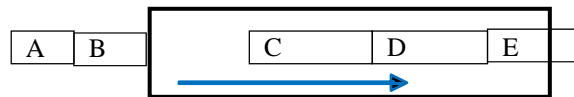
D= Decree

E= Curriculum Vitae

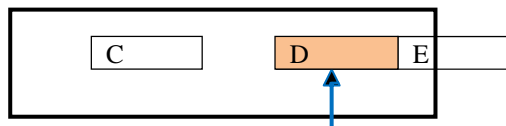
Search = D "Decision Letter"



1) The search process using the existing binary data algorithm will be divided into 2 as below



2) The data above will be divided into 2 as below



And once the data is found, the search will stop and the data will be displayed

4. Conclusion

The conclusion of this research:

- To help Politeknik negeri media kreatif developing of effectivity and efficiency management archive in Design Departement by application digital archive
- The application archive also can be managing every archive for essier access
- The application archive informing access faster and helping to get best decision
- The Binary Searching algorithm can be applied to applications and can run to perform a search even though there are weaknesses in the search process.

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