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Design of a Web Based Document Management Application at the Gunungsindur District Office Bogor Regency

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Abstract—: Efficient and secure digital archive management is crucial in the digital era. This research aims to develop a digital archive information technology system to facilitate document search and storage while enhancing data security through user authentication and authorization. The methodology includes requirements analysis, system design, implementation, and testing. Requirements analysis was conducted to understand user needs. System design involved creating an Entity Relationship Diagram (ERD) and Logical Record Structure (LRS). Implementation used PHP and MySQL. Testing was performed using the black box method to ensure system functionality according to specifications. The results indicate improved archive management efficiency, ease of document search, and enhanced data security. The system also allows for the integration of various types of archives into a structured platform. Recommendations for further development include regular security testing, adding a disposition feature, optimizing the search algorithm, and user training.

Keywords : Digital Archives, Document Management, Sequential Search, Information Technology

I. INTRODUCTION

The benefits of information technology in this era cannot be denied. The application of this technology has been applied in various fields, including the field of document archiving in an information agency has developed into the digital era. This means that information that used to be managed traditionally is managed using computer technology [1]. In the current era of information technology, administrative effectiveness and efficiency are very important aspects in improving the document archiving process. The use of technology in government agencies in archiving management is a necessity that cannot be ignored.

As a government agency, the Gunungsindur District Office has an important responsibility in managing various documents, where in document archiving activities still use conventional concepts. The obstacles that arise as a result of the increasing volume of documents that continue to grow every day in the office include the length of document searches, damage to documents, irregular document arrangements, frequent document losses, and the length of the monthly or annual recapitulation process.

An inefficient filing system can have a negative impact on an organisation, such as losing documents, the office looks untidy because of scattered documents, and having difficulty finding documents when needed again [2]. A letter is a means of communication to convey written information by one party to another [3]. Or it can also be interpreted as a written communication tool originating from one party and addressed to the other party to convey news [4].

From these problems, it can be concluded that the process of archiving and recapitulating documents at the Gunungsindur District Office is still managed manually and stored in the form of books. Seeing these conditions, the researcher provides a solution to the Gunungsindur District Office by designing a website-based E-Archive information technology. This E-Archive can be used as a digital archive storage medium, but will not eliminate the authenticity of the document. And the benefits that will be obtained from this E-Archive are that the document search

process will be faster, easier, more precise, documents are much safer from damage or loss, and streamline the recapitulation process [5]. Through the design of this website, it is hoped that a good change will occur in the management of document archives at the Gunungsindur sub-district office, then it can provide a positive change for staff in managing archives and recapitulation.

II. RESEARCH METHODS

In assisting the development of the E-Archive system in this study, researchers used the Waterfall software development model.

In the process itself, the Waterfall model has 6 different stages or phases, starting from the requirements analysis stage, system design, program code writing, program testing, and program implementation and maintenance [6]. The steps of the Waterfall model are as follows:

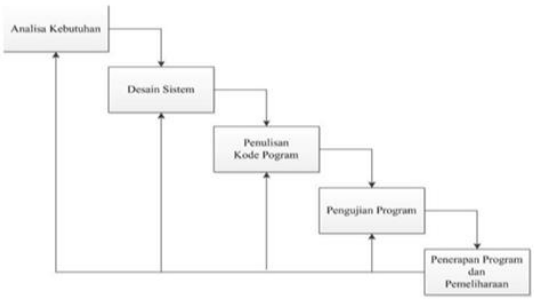

Figure 1. Waterfall Development Model

This stage aims to find out the needs of users. This step includes surveys, interviews, and literature studies. The data that has been obtained is then reviewed to get the needs that are in accordance with the needs of users in the programme to be developed.

2. System Design

System design is the phase in which the information obtained from the needs analysis stage is used to draft the development design. At this stage, developers also need to design or prepare the hardware needed to create the software architecture to be developed.

3. Writing Programme Code

Writing program code is the stage of translating a design into a language that a computer can recognise, known as coding. In this process, it is done by a programmer, who is responsible for translating a design into the programming language desired by the user.

4. Programme Testing

At this stage, programme testing is carried out to find out and identify errors and weaknesses in the software, which are then revised and updated so that the software becomes better and in accordance with the wishes of the user.

5. Programme Implementation and Maintenance

The completed programme is carried out in the maintenance stage to allow developers to fix unknown bugs, add features, and adapt the device to user needs.

III. RESULT AND ANALYSIS

Based on the results of the description above, the researcher provides a solution for the process of improving document management at the Gunungsindur sub-district office through application design and making a good activity diagram.

Application Analysis

Before designing and developing software, application analysis is an important step that must be taken. The application that is prepared later is a digital solution designed to manage, store, and distribute documents within the organisation in an efficient and secure way. The application supports various functions such as storage, search, processing, archiving, as well as document version tracking.

Problem Analysis

One way to improve the efficiency and effectiveness of document management at the Gunungsindur sub-district office is to use web-based E-Archive information technology.

Currently, the problem in managing documents manually, both data searches and recapitulation processes are not effective and efficient. By providing secure and organised digital document storage and facilitating fast and accurate document searches and recapitulation, E-Archive technology is expected to overcome these problems.

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a. Use Case Diagram

Use Case Diagram is a technique for representing the functional requirements of a system, describing the expected functionality of the system [7].

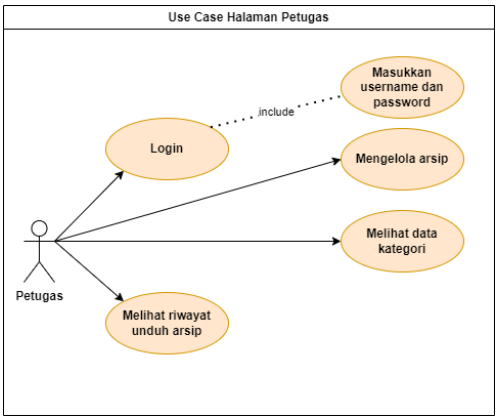

Figure 2. Use Case of Records Management Page

From Figure 2, it can be concluded that officers perform archive management, view category data, and view thedownload history of archives that have been stored which can be seen in detail in table 1 use case archive management.

Table 1. Use Case of Records Management

Use Case Name	Managing Archives
Requirement	Sub-district Officer
Goal	Officers can manage archives
Pre-Condition	The officer has logged in and selected the archive menu
Post-Condition	The system displays the archive page
Failed end Condition	Officers unable to manage archives
Primary Actor	Officer
Main Flow/Basic Path	1. Officers login first if they already have a username and password and click login. 2. The officer selects the archive menu. 3. Officers can manage archive
Invariant	1. Officer tries to delete user data, a confirmation alert appears. 2. If you select 'Yes' the archive data is deleted. 3. If you select 'No', the deletion of archive data is cancelled.

a. Activity Diagram

Activity Diagram Illustrates the main activities and relationships between activities in a process of a system [7].

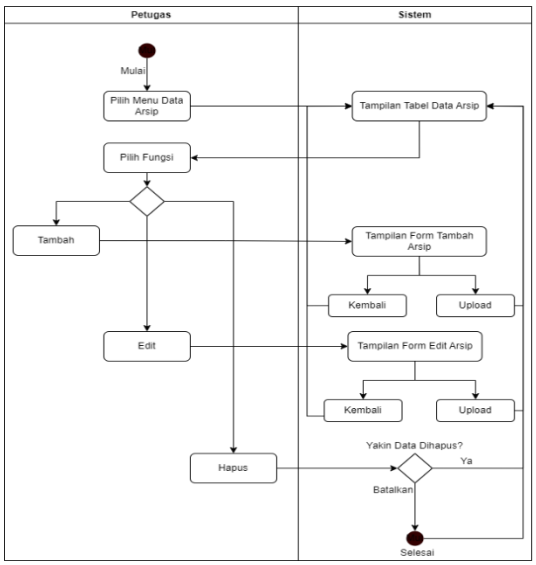

Figure 3. Activity Diagram of Manage Document Archive

Officers can manage documents systematically and structurally from adding documents, editing documents, deleting documents, saving documents, and viewing documents that have been saved.

b. Deployment Diagram

Deployment Diagram Provides an overview of the physical architecture of software, hardware, and artefacts of the system [7].

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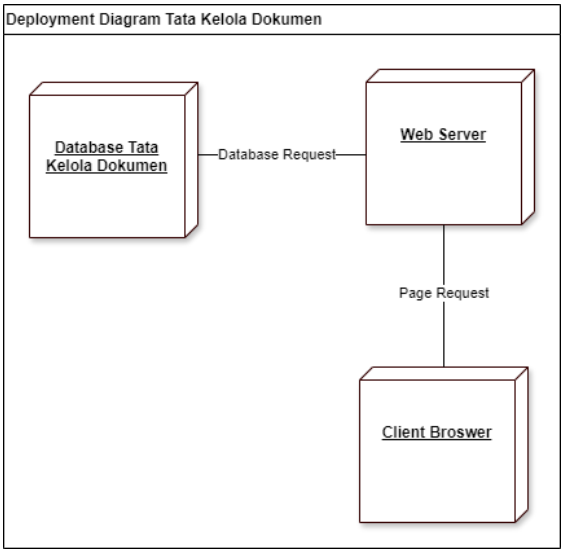

Figure 4. Deployment Diagram of Document Governance

c. Component Diagram

Component Diagrams describe the physical structure of the code, the logical view of the project classes to the actual code in which the logic is implemented [7].

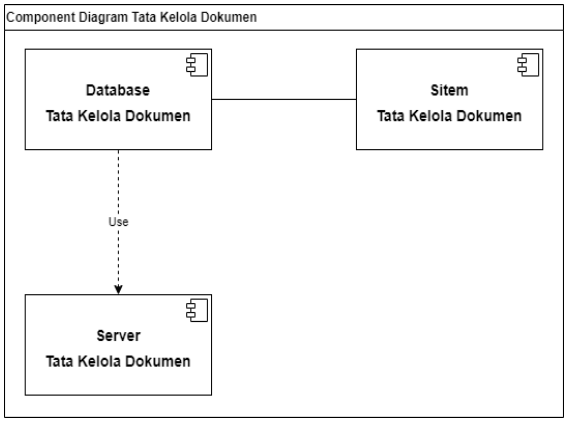

Figure 5. Component Diagram of Document Governance

Algorithm Design

The Sequential Search algorithm works by checking each element one by one until it finds a match or until all elements have been checked[8]. Sequential search can be performed on an ascending, descending, or unordered sequence. For example, we have the following list of numbers: [1, 2, 32, 8, 17, 19, 42, 13, 0]. If we search for the number 3, we will check each element in order. In this example, searching for the value 3 will result in False, because the number 3 does not exist in the list.

The Sequential Search algorithm design is written as follows:int SequentialSearch(int x)

```
{
   int I = 0;
   bool ditemukan = false;
   while ((!ditemukan)&&(i <MAX))
   {
         if(Data[i] == x)
         ditemukan = true;
         else
         i++;
    }
    if(ditemukan)
        return i;
    else
        return-1;
     }
```

ERD Design (Entity Relationship Diagram)

Entity Relationship Diagram illustrates the relationship between data in a database consisting of basic objects that have relationships or interests.

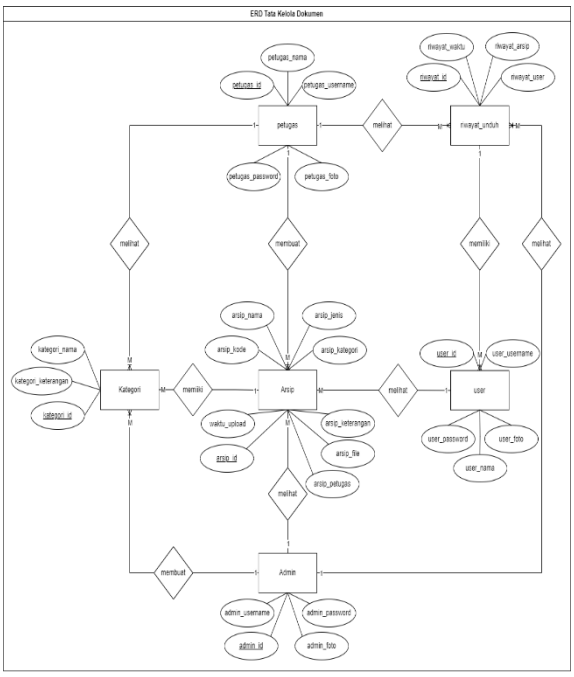

Figure 6. Entity Relationship Diagram

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Logical Record Structure

Logical Record Structure describes the way data is organised and connected to each other in a logical unit called a record. Each record in the LRS may consist of one or more fields that represent attributes or related information.

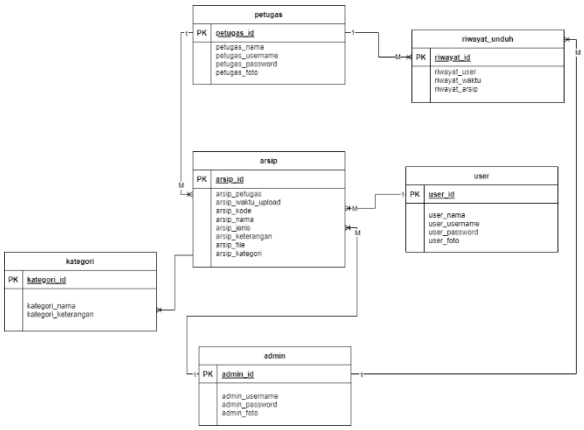

Figure 7. Logical Record Structure

System Implementation

The following is a system implementation of a web-based document management application at the Gunungsindur sub-district office:

1. User Login Page

On this page there are 3 login access rights, namely admin, officer, and user.

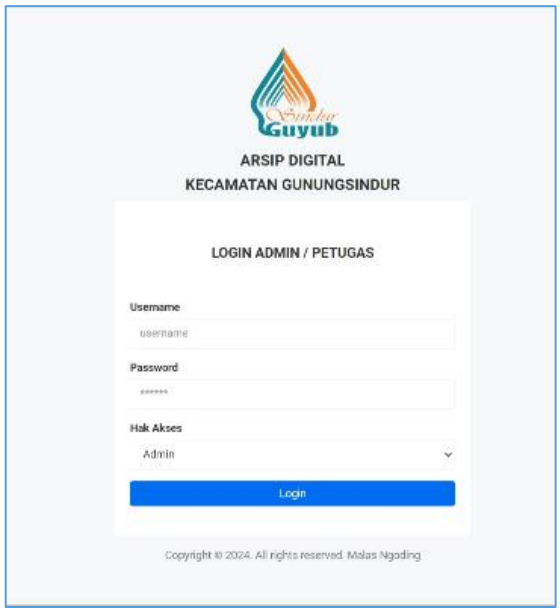

Figure 8. User Login Page

2. Admin Page

On the admin page there is a menu of category data, officer data, leader data, archive data, download history, change password, and logout.

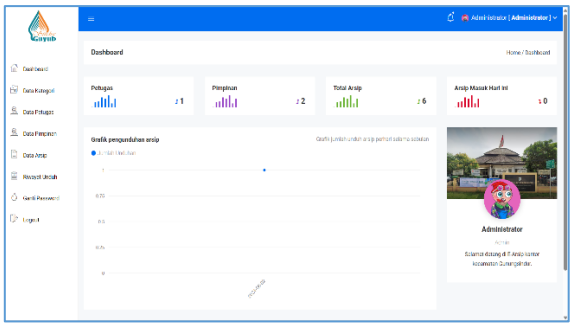

Figure 9. Admin Page

3. Officer Page

On the officer page there are several differences from the admin page where there are only archive data menus, category data, download history, change password, and logout. Here officers cannot manage officer data, and leader data.

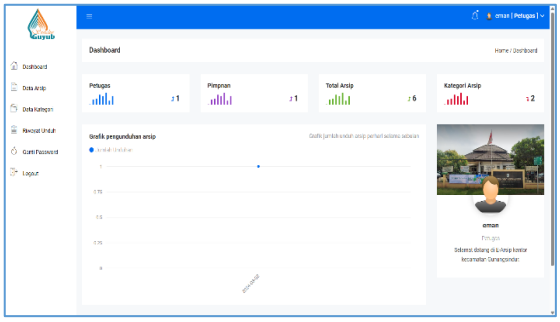

Figure 10. Officer Page

4. User Page

On the user page there is a menu for printing archives per month, printing archives per year, changing passwords, and logging out. Here the user cannot see leader data, officer data, and archive document download history.

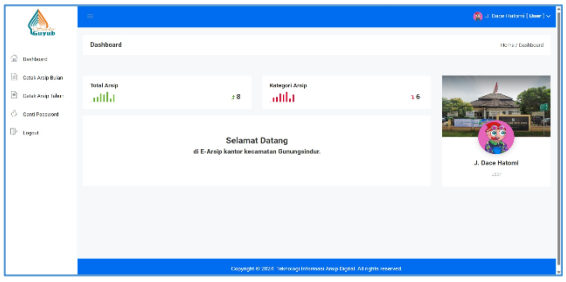

Figure 11. User Page

Testing

The test used by researchers is black box testing, which is a software testing method that tests the functionality of the application as opposed to the internal structure or work [9].

Table 2. Testing Add Document

No	Test Scenario	Test Case	Expected results	Test results	conclusion
1	Form add archive data one of the archive code, sender, category, subject, file is not filled in and click save	Archive code: (Filled in) Sender: (fill in) Category: (fill in) Subject (Filled in) File: (Empty)	Display alert required form file must be filled	As expected	Valid
2	Form add archive data one of the archive code, sender, category, subject, file filled and clicked save.	Archive code: (Filled in) Sender: (fill in) Category: (fill in) Subject (Filled in) File: (Filled in)	Display alert Archive data saved successfully	As expected	Valid

IV. CONCLUSION

In the research and development of digital archive information technology systems that have been carried out, the following conclusions can be drawn:

1. The implementation of a digital archive information technology system can help improve the efficiency of archive document management. The process of searching and storing documents becomes faster and easier to access, reducing the time it takes to find the required documents.
2. The implementation of digital archive information technology systems increases data security with user authentication and authorisation features. Only users who have access rights can view or change certain data, reducing the risk of unauthorised access.
3. The implementation of this digital archive information technology system integrates various types of archives and categories into one platform. Users can access information from various categories in a more structured and organised manner.

THANK-YOU NOTE

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