



## E-ARCHIVE DOCUMENT INFORMATION SYSTEM (CASE STUDY OF SMP NEGERI 12 DUMOGA)

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### ABSTRACT

*Document archive processing is currently growing fast but has not been maximized as in SMP Negeri 12 Dumoga, where the document archiving process is still carried out conventionally by storing physical files, which are increasing over time and require a large storage area and extra time to search for the required documents. For this reason, with the development of existing technology, school document archiving can be done through a website-based storage system. The purpose of building this system is to facilitate the educational institutions of SMP Negeri 12 Dumoga in storing and searching documents. In addition, it can minimize the loss of school documents when the documents increase more and more and accumulate. The system was built and developed using the prototype system development method, which is carried out in stages starting from communication, quick plan, modeling quick design, construction of prototype, deployment, delivery and feedback. The website-based archive system can display the number of general and important documents stored in the e-archive. This e-archiving system has four menus: General Documents, Important Documents, Categories, and User Pages. This system can make archiving documents easier for administrative staff at SMP Negeri 12 Dumoga. System development can be done by adding features for photo and video archives documenting activities at SMP Negeri 12 Dumoga and development as part of the school's main website.*

Keyword: information system, archive, website, prototype

### INTRODUCTION

Globalization greatly affects the development of human life. Various parties, from the government to the private sector, currently use digital information and communication to manage diverse data and systems that make work more manageable and efficient in terms of time and energy. Internet is a computer network that is now growing so fast in various kinds of business interests, government, and education that can be mutually related to each other, where the number of users can grow to more than 200 countries. One of them is in the education sector, such as in schools[1].

SMP Negeri 12 Dumoga has been one of the junior high schools in East Dumoga established since 2013. For almost ten years of operation, this school has continued to make changes in the field of information technology as an adaptation to globalization, but it still needs to be maximized. Through observation by researchers, it is known that SMP Negeri 12 has good quality computers and adequate internet facilities [2], [3]. However, in operations, it still uses conventional ways of working, especially in

the document archiving section. Where documents such as letters to necessary papers, in this case student certificates are only grouped into several folders and then put into a closet, so it takes a lot of time to find them one by one even in some cases, the documents are tucked away so they cannot be found. This system needs to be revised, more effective, and more efficient for operational work[4].

The archiving activity was running so far at SMP Negeri 12 Dumoga still has many areas for improvement, such as the continuous accumulation of documents that require much space and are easier to scatter and even physical damage. Based on the discussions, the principal of SMP Negeri 12 Dumoga said that the creation of the website is needed in addition to making the archiving process more effective, maximizing existing facilities, and increasing human resources in an increasingly digital era to the accreditation process in the school [1], [5].

There are several research studies about document archiving that have been done previously, for example, Sistem Informasi Pengarsipan Dokumen Berbasis Web Perumnas Regional 1 Medan by A. Simangunsong [2], 2018 which helps arrange documents and uses time more effectively. The next research was conducted by Irawan et al[3]., 2020 with title Rancang Bangun Sistem Pengarsipan Surat Kedinasan Berbasis Web Menggunakan Framework Codeigniter di SMK Asyifa Depok which produces a website using the waterfall method that makes it easier for administrative staff to process archived files computerized[4]. And the last one is Sistem Informasi Arsip Surat Pada SMA Negeri 2 Sukoharjo Menggunakan Framework Codeigneter by Astrin and Nurgiyatna, 2021 which produces an archive information system that can help activities in correspondence to be properly archived, can print reports based on the date and keywords entered and can search data at any time quickly and accurately.

Based on the background described, a computerized system is needed to overcome the problems faced by SMP Negeri 12 Dumoga regarding archiving documents [6]. The author conducted a study titled "E-archive Document Information System (study case of SMP Negeri 12 Dumoga)," which aims to assist archival data processing in replacing the existing system so that the document archive process becomes more efficient and also increases archiving security[7].

## **RESEARCH METHODOLOGY AND SYSTEM DESIGN**

### **A. Time and Place of Research**

This research is held starting in June 2022 to December 2022 with a case study at SMP Negeri 12 Dumoga Timur, the beginning of collecting information, preparing proposals, designing an information system for archiving documents at SMP Negeri 12 Dumoga, and then testing the system. The research conducted at the Computer Laboratory of the Department of Mathematics, Faculty of Mathematics and Natural Sciences, Sam Ratulangi University, Manado, and processing data at home.

### **B. Research Data**

This study uses primary data from interviews with educational institutions at SMP Negeri 12 Dumoga, namely the principal and staff, especially in the administrative section. And secondary data in the form of archive data such as incoming letters, outgoing letters, certificates and list of student final score [8]. In data collection there are several methods used for data collection during the research, namely:

- Study of Literature, this method is done by searching, reading, studying, and understanding various books, journals, theses, or scientific papers related to the topic of the research title [9], [10].
- Observation, this stage will be made by reviewing the object that is the source of the problem and communicating directly with the parties concerned who are at the place where the research is carried out, namely SMP Negeri 12 Dumoga [11].
- Interview, in this stage the author directly interviewed agencies related to the problem of filing letters, important files, and employee data to obtain the data needed in making software [12].

The hardware and software used in supporting the research, including:

- a. Hardware
  - 1) HP 14-bw0xx laptop with AMD A6-9220 RADEON R4 Processor
  - 2) 4GB RAM
  - 3) Mouse and Keyboard
- b. Software
  - 1) Operating System Windows 10 Home SL
  - 2) XAMPP (MySQL and PHP servers)
  - 3) Visual Studio Code
  - 4) Codeigniter Framework
  - 5) Draw.io

### C. Research Method

In this study, the authors used the method of developing prototype software [13]–[16] and collecting the required data. System development using this prototype model places more user involvement to provide feedback on the program starting from the initial planning and ending with the interaction between the two, explains the prototype model into several stages can be seen in Figure 1

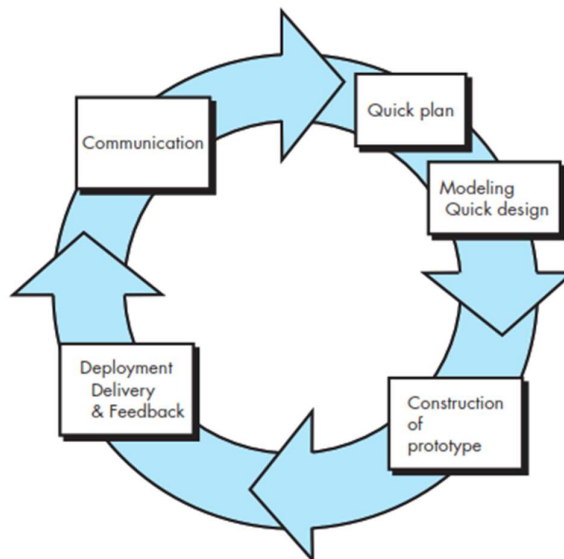


Figure 1. Prototype Method

1. Communication

At this phase, initial communication with the user is accomplished regarding the program to be made and identifying what is needed for the program. This process includes analyzing the process through interviews with employees and principals about the current document archive process and identifying problems that occur in the manual process.

2. Quick Plan

For quick plan, the researcher conducts strategic planning quickly by providing solutions to the initial identification. In this phase, the researcher makes the initial concept, such as planning the research schedule, preparing proposals, drawing flowcharts, and the researchers provide a proposal system in the form of a description of the concept to SMP Negeri 12 Dumoga, in this case, administrative staff.

3. Modeling Quick Design

This phase is focused on designing how the "shape" of the software will be, specifically how the interface layout or how the output will look so that users can understand the software through easily seen designs. At this phase, the design of context diagrams, data flow diagrams, entity relationship diagrams, and interface designs concluded. Tabel harus terkait dengan skrip sebelumnya atau berikutnya, dan ditampilkan bersama dengan skrip. Itu tidak dapat disajikan secara terpisah dari skrip atau berdiri sendiri tanpa skrip apa pun.

4. Construction of Prototype

At this phase, all the plans and designs that have been made are implemented into a programming language. And the researcher uses the codeigniter framework with the PHP programming language.

5. Deployment, Delivery and Feedback

At this phase, an evaluation process is carried out on the programs that have been made, whether something is lacking or has been running according to the wishes and needs of the user to produce a discussion of the results of system testing. After the testing phase, the software is submitted to the user to provide feedback in the form of comments regarding the software complaints that have been made. Along with the feedback process being executed, the stages of the communication process will be repeated until it reaches the satisfaction of the needs desired by a user. Then testing the program to see the functionality of the system that has been created. In this study, researchers used black box testing that focused on system functionality.

## RESULT AND DISCUSSION

### 1. Communication

Data for e-archive documents, namely general documents and important documents, were obtained from primary data from interviews with educational institutions at SMP Negeri 12 Dumoga, namely the principal and staff, especially in the administration section. And secondary data in the form of archival data for incoming letters, outgoing letters, student certificate files, and list of student final score. The research data is distributed as shown in Table 1.

**Tabel 1.** Document Archive Data

<i>No.</i>	<i>Document Archive Data</i>	<i>Number of Documents</i>
1	Incoming Letters	8
2.	Outgoing Letters	22
3.	Student Certificates	20
4.	Final Score List	20

The amount of document archive data used through the selection process is seventy, with details of eight incoming letters, twenty-two outgoing letters, twenty student certificates, and twenty student final score list data.

### 2. Quick Plan

This stage is carried out after conducting problem analysis and data collection. In this quick plan, a flowchart is created to provide system users with a description of the flow.

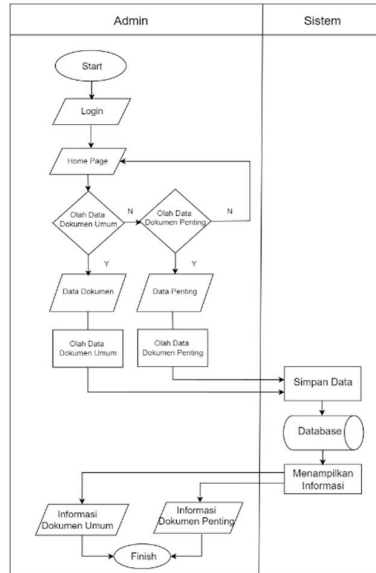


Figure 2. Admin Flowchart

The Admin flowchart describes the flow or sequence of process steps that will be executed by the admin. To enter the system, the admin must first log in. After the admin has successfully logged in, they will enter the main page in the system, where the admin can perform data processing in the form of General Document Data and Important Document Data. The data is stored in the system database and displayed for stored data information then the system is complete.

### 3. Modeling Quick Design

In this phase, several stages are made for the design of the system such as :

a. Entity-Relationship Diagram (ERD)

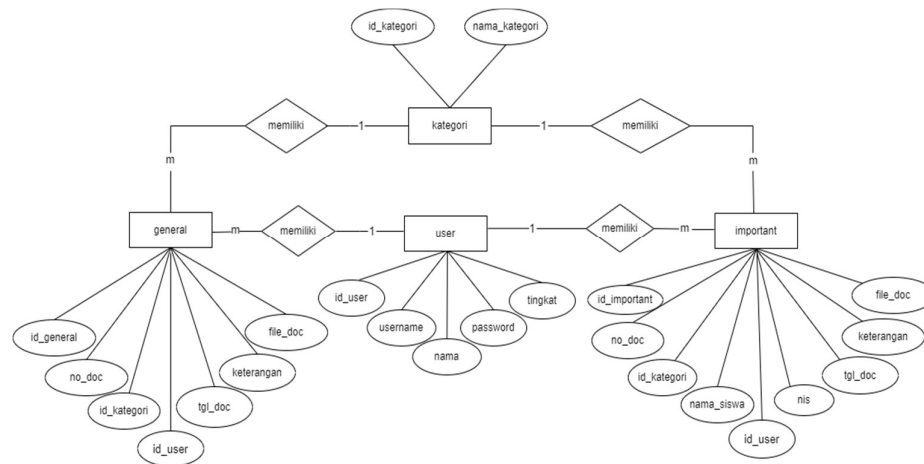
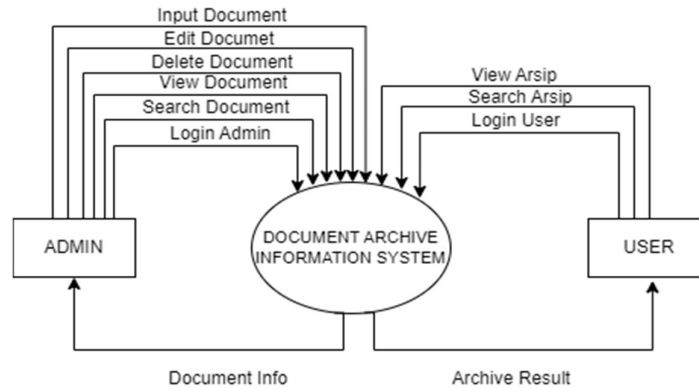


Figure 3. ERD

Based on Figure 5, it can be seen that there are four tables in the document archiving system database, namely the general document table, the important document table, the user table, and the

category table. The user table is related one to many with the general document table and the important document table so that it can be seen which user entered the document data.

b. Context Diagram

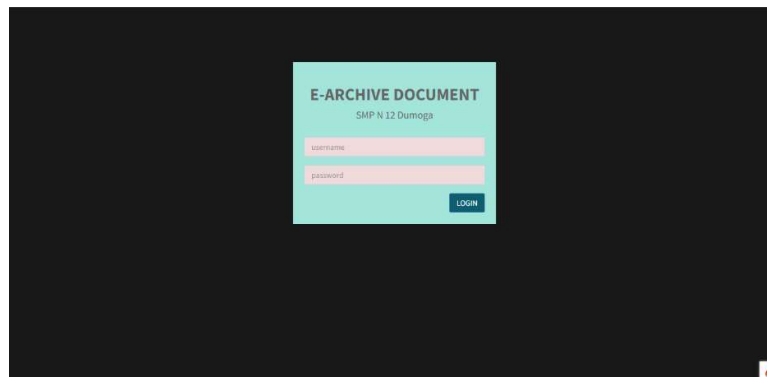


The context diagram displayed an overview of the system in general, with the process of the document archive storage system can be done by Admin and User. The Admin is the Administrative Staff, and the User is the Principal and other Employees.

**4. Construction of Prototype**

The program construction was made in the PHP language and using the codeigniter framework. The implementation of the system or interface of the Document Archive Storage System at SMP Negeri 12 in the form of a website can be seen as follows :

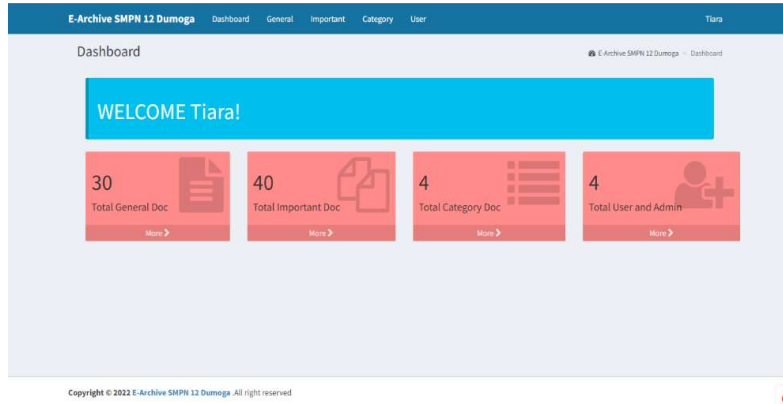
1. Login Page



**Figure 4.** Login Page

The login page is the first page that will appear on the website. Before Admins and Users can access the system, they must log in by entering the username and password as shown in Figure 4.

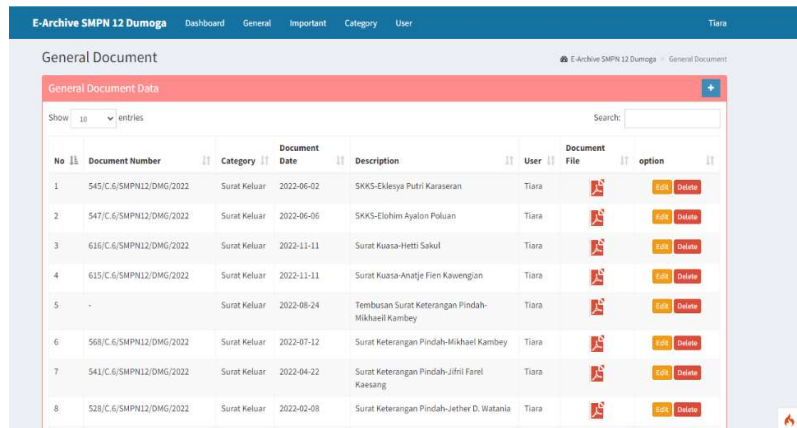
## 2. Admin Home Page



**Figure 5.** Admin Home Page

Figure 5 displays the Admin home page after logging in, where there is information on the number of general documents, important documents, categories, and users in the system. On this page, Admin can access the menus: general document menu, important document menu, category menu, and user menu.

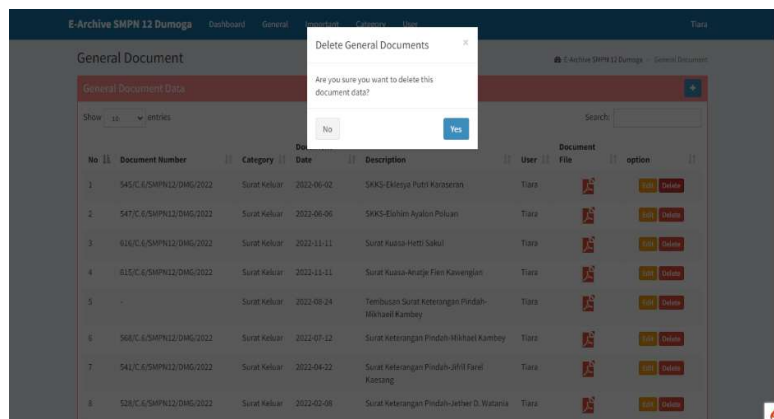
## 3. General Document Page



**Figure 6.** General Document Page

Figure 6 depicts the General Documents page on the system, which consists of two categories: incoming letters and outgoing letters, where the admin level can view letter files, add new documents, edit existing documents, and delete data from general documents. Meanwhile, the user level can only view the document info.

## 4. View and Delete Document Page



**Figure 7.** Delete General Document Page

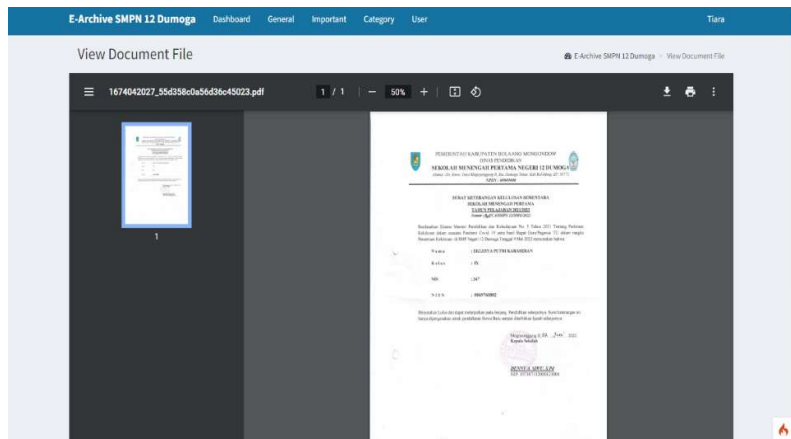


Figure 8. View General Document

Admin can access documents and add, edit, delete, and view while users can only access to view documents and print documents. Admins can delete general documents by clicking the "Delete" button in the options section, and then a dialog box will appear, as shown in Figure 22. Click the "Yes" button, and the data will be deleted, or the "No" button to cancel. Then in Figure 23, the Admin can view incoming mail files by clicking on the mail file icon.

5. Category Page

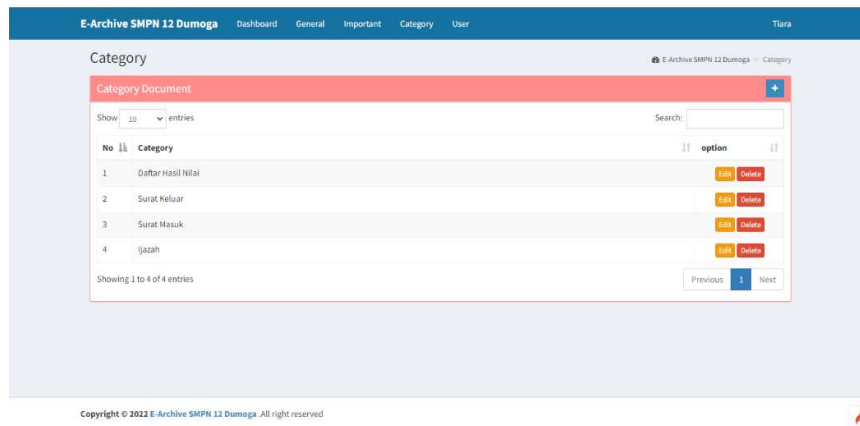


Figure 9. Category Page

Figure 9 shows the Category menu display, where the admin can add, edit, and delete categories. To add a category, the admin can click the "Add" button, and a form will appear to enter the desired category, as shown in Figure 30. Then a new category can be saved by clicking the 'Save' button then the data will be added to the system database.

5. Deployment, Delivery and Feedback

For this stage, the deployment was carried out by sending the system program to the staff of Dumoga Negeri 12 Dumoga, and for the evaluation stage, the researcher used black box testing. Black-box testing is used to test this system. Black-box testing is a software functionality testing method used to see and describe the input and output results and determine whether the system is running well or not.

1. Login Form Test

Table 2. Login Page Testing

No	Test Scenario	Trial Case	Expected Output	Test Result
	Username and password are not filled	Username : Blank Password : Blank	The system will reject and display "username required" "password required"	According to expectations



2	Username is filled in and password is not filled in	Username: Admin_1 Password: Blank	The system will reject and display “password required”	According to expectations
3	Username is not filled and password is filled	Username: Blank Password: 123456789	The system will reject and display “username required”	According to expectations
4	The username is entered incorrectly and the password is correct	Username: Admin1 Password: 123456789	The system will reject and display “Login failed: wrong username or password”	According to expectations
5	The username is entered correctly and the password is incorrect	Username: Admin_1 Password: 12345678	The system will reject and display “Login failed: wrong username or password”	According to expectations
6	The username and password are entered correctly	Username: Admin_1 Password: 123456789	The system will continue and display the admin dashboard page	According to expectations

Testing the login form function is carried out to ensure that the system logs in properly. The system only provides login access when entering the correct username and password. Then the system will refuse when entering the wrong username and password, as shown in Table 2.

## 2. General Document Form Test (Input, Edit, Delete)

Testing the general document page function is conducted to see whether the system can only input data after filling in all the document data in the form provided or whether the system will refuse when the form is empty. Then test the edit and delete features for general documents by editing incoming and outgoing mail data and deleting the document data as shown in Table 6.

No	Test Scenario	Trial Case	Expected output	Test Result
1	Add document number, category, document date, description and document file	Clicking the save button without filling in the data	The system will reject and display “There is a mistake Document Number required Category required Document Date required Description required Document File required”	According to expectations
2	Add document number, category, document date, description and document file	Clicking the save button without filling in the document number	The system will reject and display “There is a mistake Document Number required”	According to expectations
3	Add document number, category, document date, description and document file	Clicking the save button without filling in the document category	The system will reject and display “There is a mistake Category required”	According to expectations
4	Add document number, category, document date, description and document file	Clicking the save button without filling in the document date	The system will reject and display “There is a mistake Document Date required”	According to expectations
5	Add document number, category, document date, description and	Clicking the save button without filling in the description	The system will reject and display “There is a mistake Description required”	According to expectations

No	Test Scenario	Trial Case	Expected output	Test Result
	document file			
6	Add document number, category, document date, description and document file	Clicking the save button without entering the document file	The system will reject and display “There is a mistake Document File required”	According to expectations
7	Add document number, category, document date, description and document file	Clicking the save button by filling in the data completely	The system will continue by saving data to the database and displaying a message “Success! Document Data added”	According to expectations
8	Edit document number, category, document date, description and document file	Clicking the update button after updating data	The system will continue by saving data to the database and displaying a message “Success! Document Data Updated”	According to expectations
9	Delete document number, category, document date, description and document file	Clicking the delete button	The system will continue by saving data to the database and displaying a message “Success! Document Data Deleted”	According to expectations

## CONCLUSION AND SUGGESTION

This document e-archive system simplifies and assists educational institutions at SMP Negeri 12 Dumoga, mainly administrative staff, in the process of archiving documents consisting of incoming and outgoing letters, student certificates, and lists of student grades to minimize damaged and lost documents and assists in searching for documents archived.

In this document, e-archive research future system development can be done by adding features such as storing photo archives and video documentation of activities at SMP Negeri 12 Dumoga and developing it as part of the main school website.

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