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Research Articles

Designing a Web-Based Archive Management Application Using the Laravel Framework: A Case Study on a Recreational Park

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Abstract
Effective archive management is one of the main needs in supporting organizational operations, including in recreational parks that have a high volume of administrative documents. This research aims to design and implement a web-based archive management application using the Laravel framework to improve efficiency in archive storage, management, and search. The research approach involves the stages of needs analysis, system design, application development, and trials on a real work environment in a recreational park. The results of the application design show that the use of Laravel as the main framework allows for the development of a responsive, secure, and easy-to-use system. The main features implemented include digital archive storage, grouping by category, keyword-based search, and role-based user access management. Testing using the black-box testing method shows that the system functions according to the designed specifications. Based on user feedback, this application is able to reduce the time of searching archives by up to 45% compared to the previous manual method. In conclusion, this Laravel-based archive management application provides a significant solution to improve the efficiency and security of document management in amusement parks. Further research is suggested to integrate the system with cloud computing technology to support more flexible access and higher scalability.

Keywords: Laravel Frameworks; Extreme Programming Methodology; Program Planning; Archives Management Program

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1. Introduction

The development of information technology in this day and age is taking place very quickly and rapidly, and has been used to help humans in completing work that is less effective and efficient (Restaldo & Beeh, 2022). One of the activities or jobs that are positively affected by this development is the storage and management of archives in various companies or agencies. Currently, many companies have implemented digital-based archiving methods by taking advantage of technological advances that have developed rapidly to make archiving activities in their companies more effective, efficient, safe and accessible. However, not a few companies or agencies still use conventional methods in storing and managing their archives.

Archives themselves have a very close relationship with every company or agency. According to Sugiarto and Wahyono (as quoted in Veraniansyah and Sukma, 2019), Archives can be classified as "written, printed, or typed records, in the form of letters, numbers or pictures". And in its role, the archive functions as a recording or documentation of information that has been made, received or worked on by the company either in written form or recorded in various other forms of media, besides that the archive can also play a role as administrative evidence or as a consideration for decision-making (Veraniansyah & Sukma, 2019).

Recreational Park is an agency that aims to provide recreational facilities. In its operations, the Recreational Park also has the need to manage important archives related to various internal activities and administration. However, until now, archive management at the Recreational Park is still carried out manually or conventionally, where important archives will be manually grouped into binders by several staff based on the category and time of creation, then stored in the archive storage cabinet. The application of the archival archiving method using the conventional method has created several problems in the Recreational Park, especially in archive management and storage activities, some of which are, making a decrease in the effectiveness and efficiency of time in archive management or archive management activities, causing difficulties in searching archives, making archives only directly accessible, making archiving activities require extra focus and triggering the emergence of The opportunity for the risk of human error in archive management activities because archives are managed entirely by staff, and also raises a high percentage of risk of damage to archives which can be caused by various factors because archives are only stored in archive storage cabinets.

Therefore, looking at the problems that arise and the development of the times where now there are many companies and institutions that have applied digital-based archiving technology, it was decided to design a digital archiving technology in the form of a website-based application called E-Archive which can manage or manage archives that are still stored conventionally so that they can be stored and managed more quickly and automatically in digital form, and can be used easily and has been equipped with a database that is useful for storing important information related to information from archives stored on the application when the application has been used. In its design, the application is built using the Laravel 8 framework along with several other languages, tools and programming libraries consisting of PHP, Javascript, HTML, CSS, MySQL and Bootstrap 5 and in its development the extreme programming development method is a methodology applied so that in the design and development stage of the application can be more structured, fast and optimal with the hope that this application can help and become a solution to overcome problems experienced so that archiving and archive management activities in the Recreational Park can become more effective, faster and optimal.

2. Literature Review

Application is a computer program created by a computer company to assist humans in performing

certain tasks (Sujatmiko in Sopandi and Maulana, 2021). According to the full Indonesian dictionary, the meaning of archive is a document that is stored as a reference, documents in the form of letters or deeds and so on issued by official agencies. So it can be concluded that archives are recordings of information both textual, image, and audio-visual recorded by organizations, both public and private organizations, and stored using various media (Rosalin, 2017).

Archive management is the activity of collecting, managing, storing, preserving and serving archives to users, both individuals and institutions using a predetermined classification system and retrieval method (Fadhli, 2021). A website is an interconnected web page that contains a collection of information in the form of text, images, animations, audio, and video that can be accessed through an internet connection line created for individuals, organizations, and companies (Adiwisastra & Hikmah, 2020).

HTML is defined as a script for compiling web documents that are stored in regular text format and contain tags that instruct a web browser to display a specific command command (Agusriandi, 2018). CSS (Cascading Style Sheet) is a standard for creating and using styles for structured documents, CSS is used to shorten the writing of HTML tags such as fonts, color text and tables to be more concise so that there is no repetition of writing (Agusriandi, 2018).

Javascript is a scripting language that is pasted on HTML code and processed on the client side, often called the client side. This language makes HTML documents more and more widespread (Agusriandi, 2018). PHP stands for Rerusive Hypertext Preprocessor, and is a programming language that can be used for general purposes, the same as other programming languages such as C, C++, Pascal, Python, Perl, Ruby and so on. However, PHP is more commonly used for web-based application development because PHP code can be inserted inside HTML code (Raharjo, 2015).

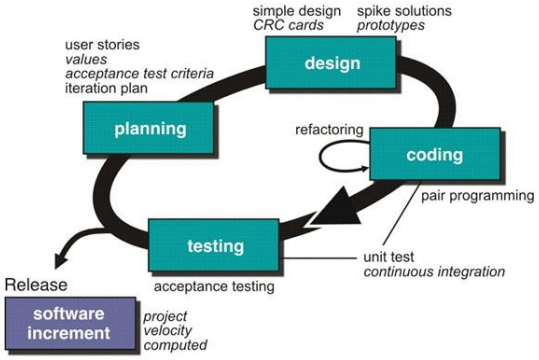
A collection of scripts (especially classes and functions) that can make it easier for developers/programmers to handle various problems in programming, such as connections to databases, variable calls, files, and others so that developers' work is more focused and faster in building applications (Yudhanto & Prasetyo, 2019). Laravel is a PHP framework released under the MIT license and built with the concept of MVC (Model View Controller) and is a website development written in PHP and designed to improve software quality by reducing initial development costs and maintenance costs, as well as to improve the experience of working with applications that provide expressive, clear and time-saving syntax (Supardi & Sulaeman, 2019). Bootstrap is one of the frameworks to help web development using HTML, CSS, and Javascript on the front-end side of the web and is designed to be able to design web pages responsively by adjusting the appearance to mobile devices such as mobile phones and tablets so that developers do not need to build separate applications to be accessible to mobile devices (Adri, 2018).

A database can be defined in a number of perspectives, namely a set of interconnected data groups that are organized in such a way that they can be reused quickly and easily in the future. In addition, a database can also be interpreted as a collection of interconnected data that is stored together in such a way and without unnecessary repetition to meet various needs. So in general, a database can be interpreted as a set of data/information that is regulated based on certain criteria that are interconnected (Andriani & Eka Purnama, 2019). MySQL is a database engine or database server that supports the SQL search database language. MySQL is a multi-threaded and multi-user SQL database management system or DBMS software developer (Setiawan & Ramdany, 2019). Extreme Programming (XP) is one of the software engineering methodologies derived from agile that is widely used to develop applications by developers and is a method that is very suitable for project development that requires quick adaptation in the changes that occur during application development and in its application the developed application will be divided into several stages of development which include, Planning, Design, Coding, Testing (Suryantara, 2017).

Unified Modelling Language (UML) is a visual language for modeling and documentation of a system using diagrams and supporting texts (Rosa & Shalahuddin, 2015).

3. Method

In the software development of this website-based archive management application, the methodology is determined by using extreme programming methods in its development and in the application of the extreme programming method has several stages which include planning, design, coding and testing stages.



Source: (Gustiawan & Tristianto, 2022)

Figure 1. Extreme Programming Methodology

Figure 1 illustrates the planning stage, the analysis of the needs needed for the program is carried out by collecting data using various methods such as observation and interviews as well as literature studies related to the objects being observed in order to plan the needs of the designed system. In this stage, the needs that have been planned and analyzed are transformed or modeled into a system design design, using the Unified Modelling Languange (UML) method and will produce various kinds of schemes and diagrams that will become the structure of the application.

The next stage is the coding stage, which is the application that is designed to begin to be developed based on the needs and design of the system that has been designed, by implementing the use of various languages, frameworks, libraries and other programming tools.

The last stage is testing, at this stage the application that has been designed will be tested to anticipate gaps and errors before the application is used by users by applying the black box testing method.

4. Result

The purpose of the study is to design a web-based archive management application in the Recreational Park, and from all the stages that have been carried out based on the methodology applied, various results are obtained, namely as follows:

Planning and needs analysis

The needs needed and planned in the archive management application are the application is able to manage archives including the addition of updates and deletion of archives, recording of changes and integrated archive information, downloading and accessing and searching archives directly and quickly,

as well as the convenience and security of the application and its access system. The next result is the result of the system design obtained based on the results of planning and needs analysis consisting of three categories including:

Database Design

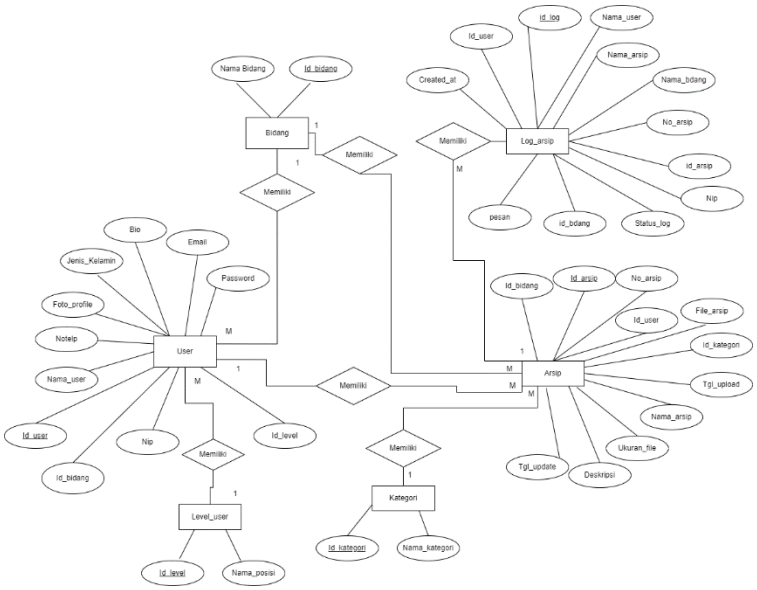


Figure 2. Entity Relationship Diagram

Figure 2 describes the entities, attributes and relationships between entities from the database in the archive management application, which consists of fields, users, user levels, archives, archive logs and categories, in addition to this image describes the various types of attributes owned by each entity completely and clearly.

System Architecture Design

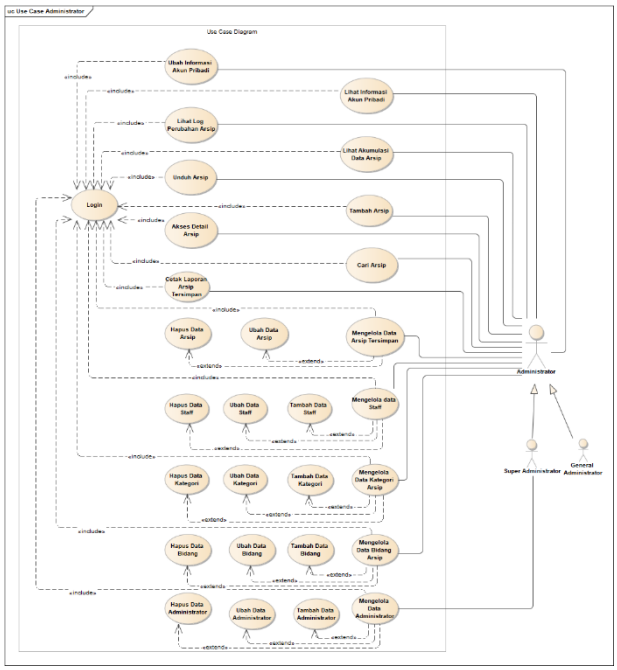


Figure 3. Diagram Use Case (Administrator)

Figure 3 shows a representation of the capabilities that can be performed by users, consisting of staff and administrators, in a system or application. In Figure 3, the administrator actor is shown, which is a generalization of two types of actors, namely General Administrator and Super Administrator. This figure shows that the General Administrator has all the capabilities that an administrator in general has, consisting of the ability to manage archive data, manage archive field and category data, manage staff who have access to applications, and access details and information related to archive change. And on the other hand, Super Administrator also has all the capabilities of an Administrator in general, plus additional authority, namely being able to manage other administrators. Meanwhile, Figure 4 depicts the Staff actor, who has more limited abilities, namely the ability to update and view personal account information, view archive change logs, download archives, access archive details, search archives and add archives.

User Interface Design

Figure 5. Administrator Dashboard Page

In this part of Figure 5, we illustrate how the design of the existing display on the dashboard page for the administrator side of the archive management application. On this page, there are various menus listed and located on the sidebar side consisting of manage fields, manage categories, manage archives, manage administrators and staff, profiles, and also exit applications.

5. Discussion

This study discusses the design of archive management applications using the Laravel framework, with the support of several languages, tools, and other programming libraries by applying the software development methodology of the extreme programming model. Based on the results that have been obtained from the development process that has been carried out, here are some points that can be discussed.

Analysis of research results

The results of the research stage show that in the design of the archive management application, it requires several stages which include planning and analyzing the needs related to the problem object, determining the design design of the application, developing the application which refers to the design results of the previous stage and then passing the testing stage before the application is used by users with the final goal of making the developed application as the answer as well as optimal solutions to the problems faced by the company.

Optimize operational efficiency and effectiveness
The digital-based archive management application makes the operation of archiving activities at the Recreational Park more optimal compared to the previous time which still used manual methods so that it requires extra time and accuracy which results in reduced efficiency and effectiveness of operational activities. With this application, archive management activities can be easily carried out through digital devices quickly and easily and organized by the system.

Improve accessibility
The creation of an archive management application has had a considerable impact on the accessibility of archives, with the presence of an application that makes archives accessible and used easily by various users who have access to the interests of stored archives.

Reduces the risk of archive damage and human error
With the use of archive management applications, archive storage and management are carried out digitally. The application of this digital method can reduce the risk of human error because the process is assisted by technological devices. In addition, storing archives digitally also reduces the risk of archive damage caused by various factors. The risk of archive damage can be reduced and overcome with the existence of digital-based archives. In the event of damage to the archive, the digital archive can still be recovered and reused from its digital storage.

Obstacles and Difficulties in the Implementation Process
Behind the various benefits it has, the implementation of this application also has various obstacles faced. One of them is the obstacle regarding the initial adjustment of some staff who are still used to using the manual method, and the answer to this obstacle is to conduct socialization and training on the use of the application.

Review of Application Implementation Success
The review of the success of the implemented application can be measured from several factors, including: The acceptance of users, staff and administrators who are users gave a high response and interest in using the archive management application after the demonstration of the application. The feedback means that users have a good opinion about this app that is able to make their job easier. Time and process efficiency, in the implementation and testing that has been carried out, the process carried out in the application has increased significantly compared to the use of conventional methods, especially in the time aspect of the activities or processes carried out.

Data security and consistency: Based on the detailed testing that has been carried out, the results of archiving activities carried out in the application from the input stage to the output stage have produced data that is consistent, safe and in accordance with what is entered by the user.

6. Conclusion

The conclusion of the research and design of a website-based archive management application using the Laravel framework is to design an application that is intended to be the answer and solution to the problems faced by the recreational park and make all archive management and storage activities or can be called archiving activities to be more effective, efficient and optimal and can help and facilitate users or staff who have a need for company archives. The result of this research and development is an archive management application built using the Laravel framework along with several tools, libraries and other

programming tools consisting of, Hypertext Markup Languange (HTML), Cascading Style Sheet (CSS), Hypertext Preprocessor (PHP), My SQL, and also Bootstrap, with the implementation of extreme programming methods in its development model.

Recommendations

Based on the results of the discussion and conclusion of the application design, here are some suggestions for subsequent research, which are as follows, carry out advanced development related to the features that are owned and less optimal in order to make the application more improved and more flexible, In the use of advanced training applications is highly recommended to its users so that they can use the application properly, maintenance and testing in the field of security from Applications still need to be done to ensure and minimize all possible errors and security gaps.

Limitations and avenues for future research

In this research, there are several limitations, namely related to the core of the problem and the topic of discussion focuses on the design of a website-based archive management application in the Recreational Park, which aims to overcome issues arising from conventional archive management methods.

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