Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 2, April 2022
DOI : https://doi.org/10.33395/sinkron.v7i2.11422
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Development of Corporate Digital Archives in the Industrial Age 4.0

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Submitted : Apr 30, 2022 | **Accepted** :8 May, 2022 | **Published** : May 11, 2022

Abstract: CV. XYZ is one of the companies in Labuhanbatu which is engaged in construction contractors who have experience in working on national projects. At the company's office, they have used computer applications in daily data processing. However, archive storage and management is still done manually. The current manual filing system can be ineffective and inefficient because the incoming and outgoing mail data often does not match the actual incoming and outgoing mail data. For this reason, a solution is needed to overcome this problem. This study aims to build an information system that can be used to manage digital-based archives in CV. XYZ. The information system built is web-based. System development using the waterfall model. This research has succeeded in building a web-based archive management information system with valid test results. The results of this study are a website-based mail filing system that has various uses such as data collection of incoming and outgoing letters, details of incoming and outgoing letters, classification of types of letters, disposition of incoming mail, reports of incoming and outgoing letters, and printing of incoming and outgoing mail reports. out, as well as printing a disposition sheet. From the results of this study it can be concluded that, to build a digital archive information system in CV. XYZ requires five stages of process, namely: requirements analysis, system design, implementation, testing, and system maintenance. The digital archive management information system has been able to provide convenience for admins and users in managing digital-based archives.

Keywords: Archive; Digitization; Industri 4.0; Information System; Waterfall; Web.

INTRODUCTION

The concept of Industry 4.0 was first put forward by the German government in an effort to project the future of digital-based production (Bigliardi, Bottani, & Casella, 2020). German Chancellor Angela Merkel said that Industry 4.0 is a collaboration between digital technology and conventional industry (Dar, Sarkum, Nasution, & Mustamu, 2018). Industry 4.0 is a digital revolution with the concept of interconnection, information transparency, technical assistance, and decentralized decisions (Hamdan, 2018). Industry 4.0 has changed the fundamental aspect, which was originally management centered on the individual (owner), now there has been collaboration and division of roles with other parties (Kasali, 2017). The impact of Industry 4.0 is the abandonment of traditional management models, to digital management (Wibowo & Haryokusumo, 2020). Today's society is a society that is very dependent on the consumption of information so that all its activities cannot be separated from the use of digital technology-based information media (Fadilla, 2020). The most widely used digital device by the Indonesian population in 2020 is mobile phones with a percentage of 96% consisting of ages 18 to 34 years (Rosyadi, Amrullah, Marcus, & Affandi, 2020).

XYZ is a company in the form of a CV (Company Limited) located in Labuhanbatu. CV. XYZ is a construction company that has worked on many national projects in the construction of residential buildings, commercial buildings, educational buildings, waterways infrastructure buildings, ports, as well as construction implementers in the construction of highways, toll roads, railroads, and airports (INDOKONTRAKTOR, 2019). In carrying out its work function, the CV. XYZ has been supported by computer facilities, so for daily data collection activities using the Ms. Word and Excel. However, in the current administration division, both correspondence and archiving activities are still using the manual system. The manual filing system is very ineffective and efficient because the recorded incoming and outgoing mail data often does not match the actual incoming and outgoing mail data. Difficulty in managing the archiving of incoming and outgoing letters is a job

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that involves a lot of data or information that must be recorded or processed regularly, so that everything related to the data or information has a certain use or value, so that the files needed can be easily found. and systematic (Sari, 2018).

Previous research related to archival information systems has been carried out by several previous researchers. Research conducted by Khaerunnisa and Nofiyati proves that the web-based village population administration service information system built with the waterfall method has functioned 80% according to user needs (Khaerunnisa & Nofiyati, 2020). The web-based archival information system has also been proven to make it easier for village officials to carry out letter archiving activities (Saifudin & Setiaji, 2019).

This study aims to build an information system that can be used to manage archives in CV. XYZ. The system built is web-based. The method used in this research is the Waterfall method. The research problem formulation is how to build a web-based archive information system at the CV. XYZ.

LITERATURE REVIEW

According to Permendagri 2012, archives are recordings of activities in various forms and media created and accepted by state institutions, regional governments, educational institutions and organizations as well as individuals (Rafidah, 2019). Records management is the work of managing archives which includes recording, controlling and distributing, storing, maintaining, supervising, moving and destroying (Lestari, 2016). The purpose of the archive is to ensure the safety of the material for national accountability regarding the planning, implementation and implementation of national life and to provide material for such accountability for Government activities (Sari, 2018).

An information system is a system that has a set of interrelated elements that collectively work together to achieve a goal (Sari, 2018). This information system contains information about important people, places, and things in the organization or in the surrounding environment (Laudon & Laudon, 2012). An information system is a set of interrelated elements or components that collect (input), manipulate (process), store, and disseminate (output) data and information and provide corrective reactions (feedback mechanisms) to meet goals (Stair & Reynolds, 2012). According to Hapzi Ali, an information system is a collection of components within a company or organization related to the process of creating and flowing information (Saputra, Mulyadi, & Martono, 2014).

Unifield Modeling Language (UML) is a visual modeling method used in the design and manufacture of object-oriented software. UML is a writing standard or a kind of blueprint which includes a business process, writing classes in a specific language (Prihandoyo, 2018). UML was created to provide the tools needed by software developers in analyzing, designing and implementing software-based systems (Kurniawan, 2018). There are several UML diagrams that are often used in the development of a system, namely: use case diagrams, activity diagrams, sequence diagrams, and class diagrams (Primadasa & Juliansa, 2020).

METHOD

This study uses observation and interviews in collecting data.

1. Observation. In this activity, direct observations were made by going to the CV. XYZ. The author observes how the process of managing incoming and outgoing letters. Based on observations, the management of incoming and outgoing letters requires 3 journals or files that must be filled in, namely the incoming mail control list book, letter disposition sheet and incoming mail control cards that need to be filled out. Filling and storing letter data does not write to the journal, but uses a computer with Microsoft Word and Microsoft Excel applications.
2. Interview. In interview activities, the authors conducted interviews about the archive management system that is currently running at the CV. XYZ. This is done to get information or direct explanation about the activities and business processes in the CV. XYZ.

The system development method used is the waterfall method as illustrated in Figure 1. Waterfall is a software development method that proceeds sequentially and consists of 5 (five) interrelated or influencing stages (Indriani, Dar, & Irmayanti, 2022). The five stages in a row are: Requirement, Design, Implementation, Verification, and Implementation.

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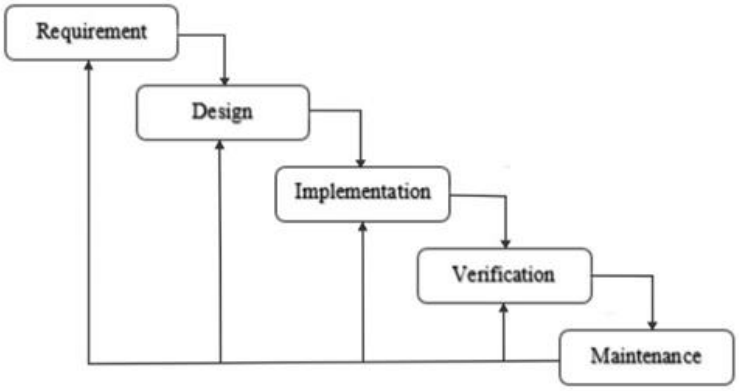

Fig.1 Waterfall Model

Requirement

At this stage, the needs analysis of the system to be designed is carried out. The trick is to understand the system that is running to identify existing problems, understand the existing business processes, and after that only a system requirements analysis can be carried out to determine the needs of the system to be designed both functional and non-functional requirements.

Design

At this stage, model the needs by using several UML tools , namely Use Case Diagrams to define the functions of the system, Class Diagrams to show classes on the system. After that, the process of translating system requirements is made into a detailed system design, including its appearance, including output design, input design, data structure design.

Implementation

At this stage, an application is made based on the design in the previous stage using the PHP framework codeigniter programming language and MySQL DBMS.

Verification

At this stage, the overall testing of the system that has been built is carried out. Testing the system using the Blackbox Testing Method by integrating the program units so that it becomes a complete system.

Maintenance

At this stage, maintenance is carried out on the system that has been created. If there are deficiencies or additions to applications or functions that have not been seen before, improvements will be made. Further maintenance will be carried out if this application has been implemented.

RESULT

This design describes the flow of the proposed system using use case diagrams. Figure 2 shows a use case diagram in the archive information system in CV. XYZ

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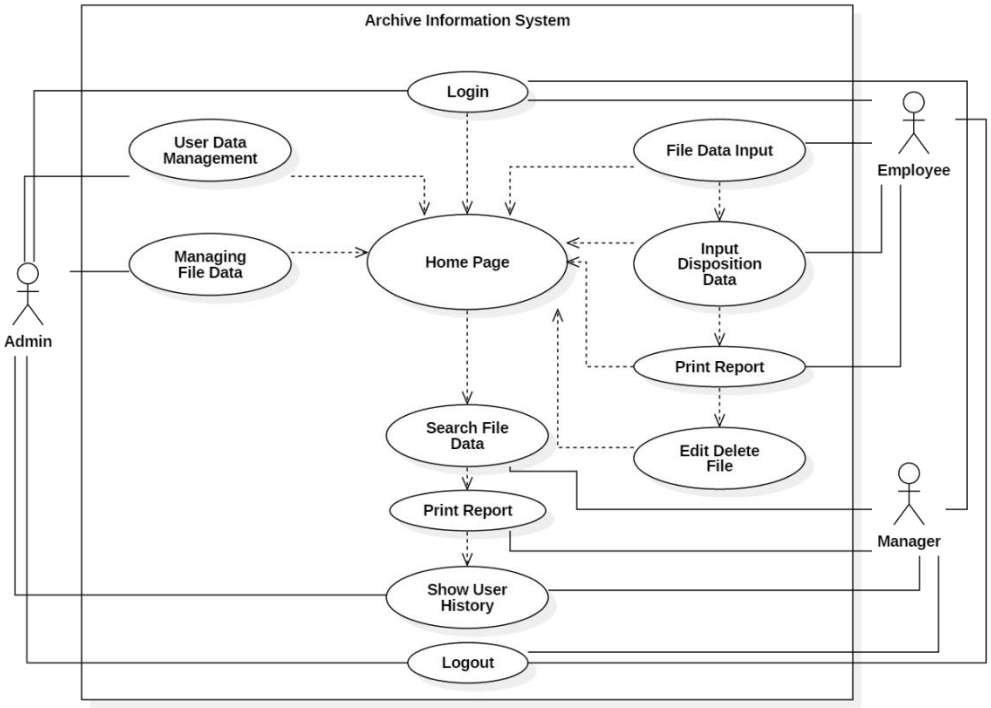

Fig.2 Use Case Diagram

The use case diagram above explains that there is a system that covers all archiving activities consisting of 3 (three) actors, including: Admin, Manager, and Employees. In the diagram there are also 12 (twelve) use cases and 12 (twelve) include performed by actors which include the login process, home menu, managing user data, managing data files, inputting data files, inputting disposition data, printing report results, edit delete files, search file data, print report results, display user history, logout.

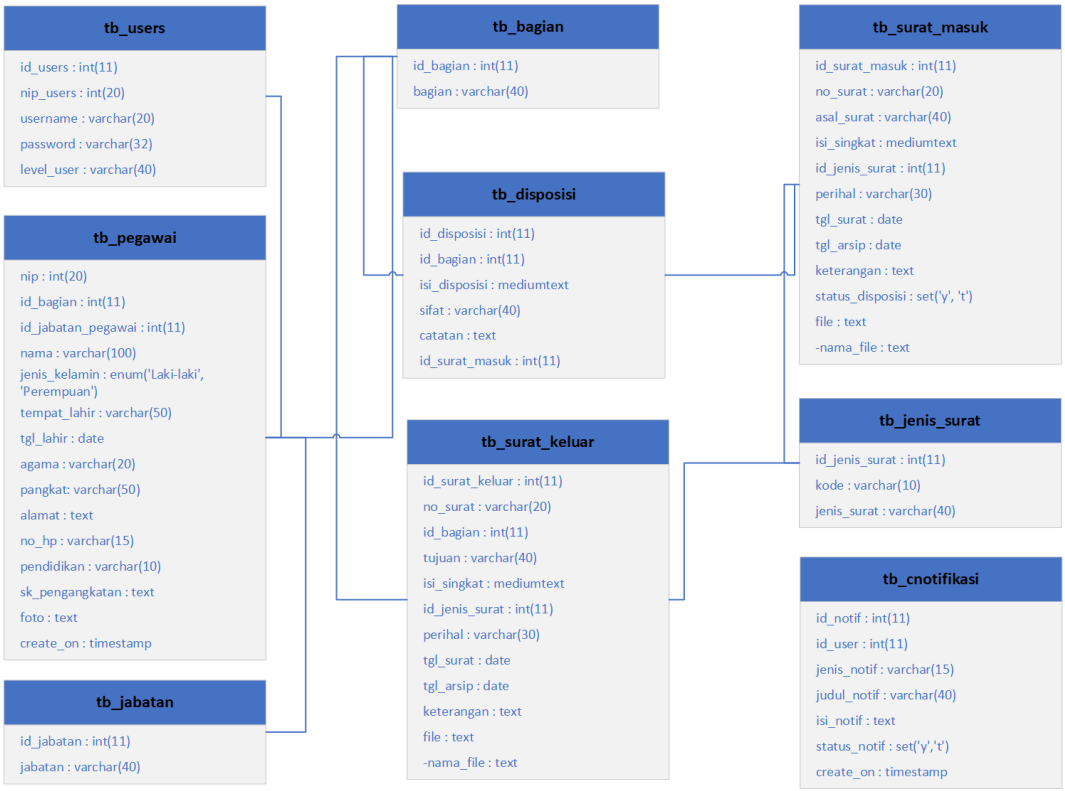

Fig.3 ER Diagram

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The ER diagram shown in Figure 3 contains 9 (nine) classes, namely: tb_user, tb_pegawai, tb_jabatan, tb_section, tb_disposition, tb_surat_dalam, tb_surat_out, tb_type_surat, and tb_notification.

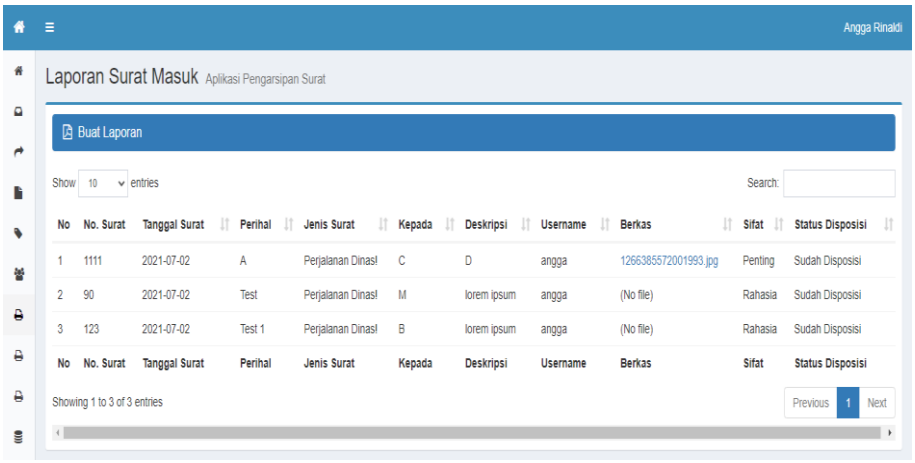

Fig.4 Incoming Mail Report

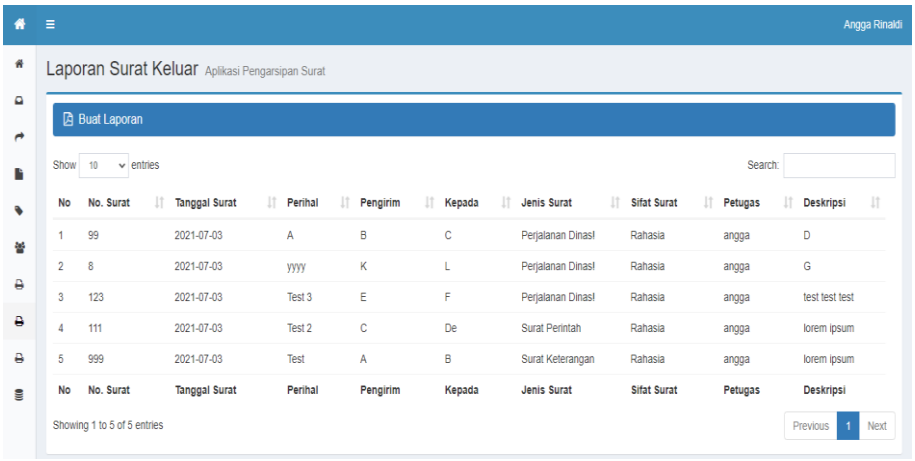

Fig.5 Outgoing Report

Figures 4 and 5 are incoming and outgoing mail pages that display the history of incoming and outgoing letters at the Aek Paining Village Office. The result of this research is a website-based mail filing system on CV. XYZ which has various uses such as data collection of incoming letters, details of incoming letters, data collection of outgoing letters, details of outgoing letters, types of letters, disposition of incoming letters, printing of incoming mail reports, printing of outgoing mail reports, printing of disposition sheets, incoming mail reports, and outgoing report.

DISCUSSION

After going through the process of system design and implementation, something very important was found that in facing the Industry 4.0 era, companies of any type and scale must improve. Improvements can be started from changes to the system which was originally manual and conventional, then changes must be made to automation and modernization. Company CV. Ziefa's work in this case must improve so that it does not lag behind the times. With this web-based archive information system, it is hoped that it can be the first step for companies to make fundamental and fast changes to systems that utilize information technology.

Table 1. Blackbox Testing Result

Testing Scenario	Expected Results	Test result	Conclusion
Login to the system	Successfully logged	The login function works	Valid

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	into the system	well and the user successfully logs into the system	
Added incoming mail disposition	Disposition data added into the system	The system has successfully added disposition data	Valid
Adding incoming mail	Incoming mail data is stored in the system	The system has successfully saved incoming mail data	Valid
Add outgoing mail data	Outgoing mail data is stored in the system	The system has successfully saved outgoing mail data	Valid
Printing disposition sheet	Creating a disposition sheet	The system successfully scored disposition	Valid

Based on the results of testing with the Blackbox testing method shown in Table 1, all functions can run according to the expected results with various test scenarios tested.

CONCLUSION

This research has produced an archive management information system at the CV. XYZ web-based. Archives management information system on CV. XYZ is able to provide convenience for admins and users in managing digital-based archives. The conclusion in this study is to build a web-based archive information system at CV. XYZ then carried out processes that include: data collection, requirements analysis, system design, system implementation, system testing, and system maintenance.

This system can be further developed in platforms based on Android and iOS. This system can be developed by taking into account the aspects of data security..

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